Valuing Birds: Understanding the Relationship between Social Values and the Conservation of Australian Threatened Avifauna



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Charles Darwin University, August 2014

Cover image: Dilapidated mural on a municipal water tank in Hobart, Tasmania, depicting community conservation efforts for the endangered Swift Parrot *Lathamus discolor*. Credit: G. Ainsworth.

Declaration of original authorship

I hereby declare that the work herein, now submitted as a thesis for the degree of Doctor of Philosophy with Charles Darwin University, is the result of my own investigations, and all references to ideas and work of other researchers have been specifically acknowledged. I hereby certify that the work embodied in this thesis has not already been accepted in substance for any degree, and is not being currently submitted in candidature for any other degree.

G. Anniett

Gillian Barbara Ainsworth

Foreword

As this is a study of people's attitudes and values, and an exploration of how people come to work in threatened species conservation, it seems appropriate to offer some insights into my own values and attitudes by briefly outlining my journey to this point.

Like many of the people I interviewed in this research, my interest in the natural world developed at a very early age and was encouraged by my parents. My home, near Edinburgh in Scotland, was filled with cats and dogs while my formative years were spent mostly on horseback exploring the countryside. Family holidays abroad inspired an interest in overseas travel while a school project on Australian flora and fauna at the age of 11 sparked an idea about living amongst exotic animals like koalas, kangaroos and brightly coloured parrots.

Foreign languages were a favourite subject at school so I undertook a Master of Arts with Honours degree in Mandarin and Japanese at Edinburgh University followed by a post-graduate diploma in marketing. Following in my father's pharmacist footsteps, I joined an international pharmaceutical market research company in London and embarked on a seven year career designing and managing healthcare-related research projects. After two years developing interviewing, research and project management skills in a large office near London, in 1995 I relocated to the company's regional office in Hong Kong for three hectic years where I was responsible for conducting multi-country research projects across Asia for international clients. A lucrative promotion to the company's new Barcelona office was followed by a secondment to the USA office to manage a 10 country project. Although I didn't know it then, I was building a number of research and social science skills that would prove essential for conducting this PhD project.

In 1999, I emigrated to Australia and continued my career but the higher I rose in the corporate world the further I seemed to go, not only from nature but also from the values I held. After much soul searching, I gave it all up to work in environmental conservation. My new career began with door-knocking the suburbs of Melbourne for The Wilderness Society where I soon gained a position as office manager/fundraiser and helped turn the office's financial affairs around. Yet Melbourne's weather reminded me too much of Scottish winters and my travels had taught me the only way to find opportunities was to be bold and seek them out. My

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husband and I sold our possessions and explored Australia by 4WD. We found our bushland home in Darwin's rural fringe in the Top End of Australia and over the last 12 years land management responsibilities have helped me understand how differing social values impact on habitat restoration efforts. I continued working with environmental non-government organisations, funding, managing and advocating for nature conservation. In early 2007, Prof Stephen Garnett in Charles Darwin University's School for Environmental Research took me under his wing as a Research Associate. For three years, Stephen provided me with opportunities to develop academic research skills and evolve my understanding of nature conservation before encouraging me to undertake this PhD.

While working with The Wilderness Society I organised an art auction and bought a photograph that still hangs in my house titled 'The Road Less Travelled.' It's a very apt description of my journey to this PhD, which represents the convergence between a lifelong love of nature and an accumulation of life skills and experience. I sincerely hope this research will be of benefit to both readers and the wildlife for which it was conducted.

Acknowledgements

I am especially grateful to my supervisory panel: Dr Heather Aslin, Prof Stephen Garnett (both from Charles Darwin University) and Dr Mike Weston (Deakin University). I could not have asked for better mentors and being in a research team together was an enormously positive experience. I was really pleased when Heather agreed, as Principal Supervisor, to guide me through the turbulent waters that are the interdisciplinary PhD. Heather's theoretical and practical insights into this thesis topic have been immeasurable and I am most grateful to her for sharing her knowledge and ideas so generously and encouraging me to reach just a little bit higher. Stephen developed the original concept for this research as part of his Australian Research Council (ARC) project 'Increasing the effectiveness and efficiency of Australian threatened bird conservation'. I am truly thankful to him for entrusting me with it and giving me the freedom to make of it what I would; also for his guidance on all things ornithological and threatened species-related; and for funding part of my quantitative survey fieldwork. Mike's extensive knowledge about birds and dedication to conserving them were a constant inspiration and, like many, I have benefitted from his considerable on-ground experience and research insights. I especially thank Mike for always finding time for me in his gargantuan schedule and for helping this 'statistiphobe' discover the wonder in statistics.

This project was conducted with the support of various other individuals and there are three people from Charles Darwin University who I would particularly like to thank. Dr Adam Drucker and Dr Lynda Prior (now respectively with Bioversity International and the University of Tasmania), supported my PhD application in 2009. Dr Kerstin Zander collaborated on environmental economic components of the quantitative surveys and helped me with early statistical analyses.

I also extend sincere appreciation to everyone who participated in my surveys and case study interviews; the research could not have happened without them and it was a privilege to meet some highly dedicated individuals working to conserve Australia's threatened birds. Thank you also to Tim Holmes, who managed the ARC project's institutional PhD program, and with whom I conducted some joint case study interviews, for sharing his enthusiasm for birdwatching while on our fieldwork travels. I thank Jonathan Dyer for proofreading my thesis and providing

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professional editorial advice in line with the *Australian Standards for Editing Practice*. Thank you also to Chris Tzaros, Tony Kirkby and Wayne Houston for providing photographs of case study birds.

Regarding research and funding bodies, I am indebted to CDU's Research Institute for the Environment and Livelihoods for hosting my research and sincerely thank the Faculty of Engineering, Health, Science and the Environment for supporting my project through various conference, research and supervisor travel grants. The Australian Government supported this project through an Australian Postgraduate Award scholarship. I am especially grateful to BirdLife Australia (BLA) for awarding me the Stuart Leslie Bird Research Award 2010 to conduct my quantitative surveys in collaboration with Sara Johnson and Aimee Freeman of the BLA Birds in Backyards program. Receiving The Nature Conservancy Applied Conservation Award 2011 was a privilege and a relief – without the grant I could not have travelled to Western Australia to interview participants in my 'White-tailed Black-cockatoo Case Study' and would have missed seeing Baudin's and Carnaby's Cockatoos in the wild. Other benefits of the award included a unique opportunity to present my case study findings at the Ecological Society of Australia conference in 2012 and the chance to turn my communications strategy ideas into reality by creating 'A Tale of Two Cockatoos': http://cockatoos.treehugger.com.au/.

Of course, none of this would have happened were it not for the limitless support and encouragement of my parents, Ronald and Sheana Ainsworth, who nurtured my early love of nature and encouraged me to fulfil my dreams, no matter how far from our Scottish home they took me – two great gifts for which I am eternally thankful. My deep gratitude goes to my husband Tim for always believing in me, for being a wise sounding board and for doing everything in his power to help make this research happen. Tim's script-writing, design and animation skills enabled me to adapt some of my research findings into a website and short film for 'A Tale of Two Cockatoos' to promote the plight of Baudin's and Carnaby's to the scientific community and beyond. He also designed some of the original diagrams presented in this thesis.

Last but not least, various non-human animals have been, in the words of Claude Lévi-Strauss, 'good to think' with. These range from my feline family members to the threatened

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birds encountered during fieldwork. Mostly though, I appreciate the large variety of birds, invertebrates, mammals, reptiles, amphibians and fish with which I share a Top End bushland home. As individuals they offer many a welcome distraction from my desk and as species they give me the incentive to conserve. It is to their future that I dedicate this research.

Abstract

This thesis examines relationships between people's values, attitudes and behaviours with respect to threatened bird conservation in Australia. Three main research questions are addressed regarding: how Australians value threatened birds; who is involved in threatened bird conservation and how they communicate their values; and whether the values held for particular species of threatened birds affect the success of strategies used to conserve them.

The inquiry is situated within the discipline of social psychology, social constructionism theory and the field of human dimensions of wildlife research. It is informed by Kellert and Clark's (1991) wildlife policy framework and Kellert's 'attitudes towards animals typology'. An interpretive, mixed-methods approach examined values held by different sectors of Australian society. A new typology of 12 avifaunal attitudes was developed to describe the different ways Australians value birds. Three quantitative online surveys of 3,818 members of the public examined Australian attitudes towards threatened birds. Three qualitative case studies (three matched pairs) of Australian threatened birds investigated the opinions of 74 key informants about the influence of stakeholder values, and those of other sectors of society, on threatened bird conservation.

Case study and survey participants commonly expressed biophysical, conservation, ecological, experiential, humanistic and moral attitudes towards threatened birds. The surveys revealed strong support for conserving threatened birds; two distinct value orientations towards threatened birds, 'avicentrism' and 'anthropocentrism', were associated with respondents' socio-demographic characteristics. The case studies demonstrated disparity in conservation investment and prioritisation between taxa.

This research demonstrates the importance of understanding how social factors influence wildlife policies and processes relating to threatened bird conservation. It highlights consequences associated with privileging scientific values in the conservation process. The findings reveal how the social constructions of threatened birds and the issues affecting them influence societal interest and conservation investment. The results provide decision-makers with insights into developing effective frames to convey a broad range of threatened bird values to policy-makers and society.

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List of abbreviations

ACT:	Australian Capital Territory		
ARC:	Australian Research Council		
ASI:	Animals and Society Institute		
BIBY:	Birds in Backyards (BirdLife Australia citizen science program)		
BA:	Birds Australia (since 2011 known as BirdLife Australia)		
BAWAPAG:	BirdLife Australia Western Australia Project Advisory Group		
BLA:	BirdLife Australia		
CBCRG:	Carnaby's Black-cockatoo Research Group		
CBCRP:	Carnaby's Black-cockatoo Recovery Project		
CITES:	Convention on International Trade in Endangered Species		
CMA:	Catchment Management Authority		
CQU:	Central Queensland University		
CSIRO:	Commonwealth Scientific and Industrial Research Organisation		
Cwlth Govt:	Commonwealth Government of Australia		
DAFWA:	Department of Agriculture and Food Western Australia		
DEC:	Western Australian Department of Environment and Conservation (since 2013		
	known as Department of Parks and Wildlife)		
DEHP:	Queensland Department of Environment and Heritage Protection		
DEWNR:	South Australian Department of Environment, Water and Natural Resources		
DLRM:	Northern Territory Department of Land Resource Management		
DoE:	Commonwealth Department of the Environment		
DPIPWE:	Tasmanian Department of Primary Industries, Parks, Water and Environment		
DPIWA:	Department of Planning and Infrastructure Western Australia		
DSE:	Victorian Department of Sustainability and Environment		
DSEWPaC:	Commonwealth Department of Sustainability, Environment, Water, Population		
	and Communities (since September 2013 Department of the		
	Environment)		
ENGO:	Environmental non-government organisation		
EPA:	Environment Protection Authority		
EPBC Act 1999:	Environment Protection and Biodiversity Conservation Act 1999		
ESD:	ACT Department of Environment and Sustainable Development		
FBA:	Fitzroy Basin Authority		
FBCRT:	Forest Black Cockatoo Recovery Team		
FPC:	Forest Products Commission		
GLM:	General Linear Model		

HAS:	Human-animal studies
HDW:	Human dimensions of wildlife
IUCN:	International Union for Conservation of Nature
IBA:	Important Bird and Biodiversity Area
IPA	Indigenous Protected Area
KNP:	Kakadu National Park
LGA:	Local Government Authority
NC Act 1992:	Nature Conservation Act 1992
NP:	National Park
NRM:	Natural resource management
NSW:	New South Wales
NT:	Northern Territory
OBP:	Orange-bellied Parrot
OBPRT:	Orange-bellied Parrot Recovery Team
OEH:	NSW Office of Environment and Heritage
PBFD:	Psittacine Beak and Feather Disease
PCA:	Principal Component Analysis
PPP:	Project Prioritisation Protocol
Qld:	Queensland
QPWS:	Queensland Parks and Wildlife Service
RFA:	Regional Forest Agreement
SA:	South Australia
SPP:	Species
SPRAT:	Commonwealth Government Species Profile and Threats Database
SPRT:	Swift Parrot Recovery Team
SV:	Social Values quantitative surveys
Tas.:	Tasmania
TCT:	Tasmanian Conservation Trust
TPWC Act:	Territory Parks and Wildlife Conservation Act 2000
USA:	United States of America
Vic.:	Victoria
WA:	Western Australia
WAFGA:	Western Australian Fruit Growers' Association
WAFPC:	Western Australian Forest Products Commission
WC Act 1950:	Wildlife Conservation Act 1950
WVO:	Wildlife value orientation

CHAPTER 1: Situating the Research

1.1 Nature of the investigation

Australia hosts a substantial proportion of the world's diversity of bird species¹ (Dutson, Garnett & Cole 2009). Birds are an important part of Australia's natural environment and are valued by Australians for diverse reasons, but many of Australia's bird species are threatened with extinction, often due to human activities. The rate of bird species decline in Australia is faster than the global average (Szabo *et al.* 2012). Although substantial resources are invested in trying to prevent species extinction, with some success, Australia appears to be 'out of step' with the global community regarding its commitment to biodiversity conservation²; it is listed 38th out of the 40 most underfunded countries in the world for spending on biodiversity (Garnett 2013; Waldron *et al.* 2013). Moreover, little is known about how Australians perceive either the loss of native bird species or the importance of threatened bird conservation. If further loss of species is to be prevented, it is essential to understand how Australians value threatened³ birds: this research contributes to our understanding of these values.

1.1.1 Status of Australia's bird species

Australia has an estimated 696 native bird species, almost half of which are endemic⁴ (317 species) (BirdLife International [BLI] 2013). Australia hosts many globally important populations, sharing them with neighbouring countries and regions, or providing part of their migratory flyways (Dutson, Garnett & Cole 2009). However, since European settlement in 1788, 27 Australian bird species and subspecies⁵ have become extinct. Of the 1,239 currently recognised

¹ A group of biological entities that: a) interbreed to produce fertile offspring; or b) possess common characteristics derived from a common gene pool; and includes c) subspecies. (*Environment Protection and Biodiversity Conservation Act 1999*) [EPBC Act 1999] (Section 1.3.6.1).

² The action of conserving something, in particular: preservation, protection or restoration of the natural environment and of wildlife; prevention of wasteful use of a resource (Oxford Dictionaries Online 2013a).

³ Taxa considered either 'Critically Endangered', 'Endangered' or 'Vulnerable' according to International Union for Conservation of Nature (IUCN) Red List Categories and Criteria (IUCN 2013).

⁴ Native or restricted to a certain place (Oxford Dictionaries Online 2013b).

⁵ 'A geographically separate population of a species, characterised by morphological or biological differences from other populations of that species' (*EPBC Act 1999*, p.489).

bird taxa⁶ in Australia, one in five is classified as threatened (Garnett, Szabo & Dutson 2011). According to the International Union for Conservation of Nature (IUCN) Red List of Threatened Species⁷, Australia is ranked 13th in the world for its number of globally threatened bird species (BLI 2013) (Table 1.1).

Substantial funds are spent by government, private, non-government and community sectors trying to avoid further avian extinctions (Garnett, Crowley & Balmford 2003; Garnett, Szabo & Dutson 2011; Weston *et al.* 2003). Loss of habitat is the major threat to many bird taxa but threats are diverse and include: impacts from major industries, such as intensive agriculture and overgrazing by cattle; trapping by long line fishing; increased frequency, size and intensity of fires; and predation by introduced species. Many threats are inter-related and have operated for a long time (Olsen 2008). Most are a side effect of other human activities and are a consequence of complex global social systems which are not readily changed.

Table 1.1: Australian bird taxa listed by IUCN Red List Categories in Australia, according to *The Action Plan for Australian Birds 2010* (Garnett, Szabo & Dutson 2011), and globally, according to the *IUCN Red List 2013* (BLI 2013). Categories are listed in decreasing order of extinction risk. Taxa listed in higher extinction risk categories have a higher expectation of extinction (IUCN 2013).

Category	Action Plan 2010	IUCN Red List 2013
	(Australian listed bird taxa)	(Globally listed bird species)
Extinct	27	8
Critically Endangered	20	2
Endangered	60	22
Vulnerable	68	27
Near Threatened	63	24
Least Concern	1,028	613

1.2 Why study Australian birds?

Birds are important for many biological and social reasons. They provide a range of ecosystem services such as nutrient transfer between oceanic and terrestrial ecosystems and consumption of agricultural pests (e.g. insects), dispersal of seeds and pollination (Collar *et al.*

⁶ 'Any taxonomic category (e.g. a species or genus), and includes a particular population' (*EPBC Act 1999*, p.490); the plural 'taxa' is a collective term for species and subspecies.

⁷ Provides taxonomic, conservation status and distribution information on plants and animals that have been globally evaluated using the IUCN Red List Categories and Criteria (IUCN 2013).

2007). Because they have been studied for longer and more comprehensively than any other faunal group, they can often act as indicators i.e. 'surrogates' which reflect local biodiversity (Larsen *et al.* 2012; Lewandowski, Noss & Parsons 2010). For example, it has been suggested they can tell us about species endemism at various ecological levels; diversity of bird species can reflect diversity of other species such as fish or insects; degrees of threat to birds can indicate particular places on earth where pressures on biodiversity are substantial, or without intervention are soon to be so; and the Important Bird and Biodiversity Areas⁸ (IBAs) model is internationally accepted as a powerful conservation tool through protection of vital habitats (BLI 2014; Collar *et al.* 2007; Juffe *et al.* 2013).

Birds have long played a vital role in the development of human culture and our understanding of ourselves. For example, birds have been highly influential to science, inspiring the development of aviation (Nychka & Chen 2012), among other things. Birds are important characters in myths and fables, representing gods or acting as messengers and augurs (Mynott 2009). Birds have featured strongly in the arts and humanities throughout the ages and most cultures across the world still represent birds in their artworks, literature, music and dance (Mynott 2009). Birds are popular in modern culture where they appear in a multitude of forms: names are applied to places, products and people; physical attributes represent symbols of power or freedom; and certain species symbolise characteristics such as purity, fidelity or mischief which we apply to ourselves through metaphor (Cozzolino 1980; Mynott 2009; Ainsworth *et al.* 2010).

In Australia, it is relatively easy for the average person to encounter and observe birds and birds are particularly familiar and popular for a number of reasons: they occur in great variety across the continent; inhabit every habitat type including urban areas; are for the most part diurnal and in many cases common; and they can be highly conspicuous due to bold colouration and loud calls (Simpson & Day 2004). Hence, birds are of significant public interest to Australians, many of whom actively engage with them on a regular basis in various ways. The most common types of activities relate to different attitudes and motivations and provide

⁸ A global network of important sites for biodiversity conservation identified using internationally agreed criteria applied by local experts (BLI 2014).

insights into the complex relationships Australians have with birds as living organisms, therefore they are explored briefly below.

1.2.1 Watching birds⁹

Australia provides world-renowned birdwatching and ecotourism opportunities which contribute significantly to the Australian economy (Connell 2009; Jones & Buckley 2001). People birdwatch away from home for the intellectual stimulation it provides and for opportunities to appreciate and enjoy nature (Sali, Kuehn & Zhang 2008). Birdwatching is often conducted by people visiting national parks and reserves or while out bushwalking (Tourism Research Australia [TRA] 2010) where facilities are sometimes provided to aid birdwatching while reducing disturbance to birds (Fredline 2007; Higginbottom & Buckley 2003). Some people deliberately modify their homes and gardens to accommodate their birdwatching activities (Birds in Backyards [BIBY] 2012). Family support, friends and members of birding organisations are thought to drive interest and specialisation in birdwatching (McFarlane 1996). Australia's peak ornithological body, BirdLife Australia (BLA), has around 25,000 members, supporters and volunteers and around 12,000 Australians participate in BLA's Birds in Backyards (BIBY) citizen science program (BirdLife Australia [BLA] 2011).

1.2.2 Conserving birds

Some birdwatchers are also conservationists, many having contributed significantly to knowledge about Australian biodiversity. Birdwatchers were the first organised interest group to officially support conservation in Australia (Hutton & Connors 1999). The in-kind investment of volunteers in the recovery of threatened birds is considerable and the importance of non-government birding organisations, such as BLA, for sourcing, coordinating and training committed volunteers is significant (Weston *et al.* 2003). Volunteers contribute by gathering bird population survey data (BLA 2013a), fulfilling important roles on bird recovery teams,

⁹ Definitions of the term 'birdwatch' vary quite broadly so that in one sense, birdwatching involves observing birds in their natural habitat for enjoyment or as a hobby and often includes identifying birds or searching for new, unusual or rare types (Oxford Dictionaries Online 2013c), and in another it can mean leisurely observation of birds in one's garden from the living room (Cammack, Convery & Prince 2011).

conducting highly technical citizen science projects, and raising community participation and awareness. This can lead to community ownership of recovery projects and generate political and financial support for bird conservation (Weston *et al.* 2003).

1.2.3 Keeping birds

Birds are important in and around the home too. Australia has one of the highest rates of companion animal ownership in the world (Australian Companion Animal Council [ACAC] 2010). Companion birds are especially favoured and their popularity is growing (ACAC 2010). Bird-keeping is much more popular in Australia than birdwatching with one in five households keeping (mostly) native birds in cages, aviaries and other confined domestic circumstances, such as 'backyard' birds (e.g. domestic fowl) (Franklin 2007a). Australians spent \$184 million in 2009 buying and feeding birds and birdkeeping appears to be on the increase with many households owning more than one bird at a time (ACAC 2010; Franklin 2007a). Birds are thought to be popular companion animals in Australia due to changing residency trends, whereby people are increasingly living in apartments and rental properties, often with limited space (ACAC 2010; Franklin 2007a).

Birds can be kept for utilitarian, scientific and conservation reasons too, and circumstances surrounding the keeping of backyard and aviculture birds are slightly different. Domestic fowl are likely to be kept primarily for utilitarian purposes (e.g. for their meat, eggs and feathers), whereas aviculture birds are not strictly domesticated and activities include breeding, commercial trade, conservation and advancement of scientific knowledge. The latter may imply a commitment to developing scientific, conservation and natural history expertise and knowledge (Bird Keeping in Australia 2003).

1.2.4 Feeding birds

Observing and feeding wildlife¹⁰, including wild birds, are also common activities (Franklin 2007a; Jones 2011). Bird feeding by individuals at home and as an organised tourist attraction is popular and commercially lucrative to the Australian economy (Orams 2002). Almost two thirds

¹⁰ Wild animals collectively; the native fauna (and sometimes flora) of a region (Oxford Dictionaries Online 2013d). Here, introduced, feral and pest species are also included.

of Australians actively encourage birds to visit their local area and six in ten Australian households feed wildlife (Franklin 2007a; Howard & Jones 2004), including birds (Jones 2011). Although wild bird feeding is frowned upon by wildlife and conservation organisations in Australia for its potential to impact negatively on the health of birds or to incite aggressive food-seeking behaviour, it is a common activity conducted privately in gardens and publicly in parks and reserves, and often undertaken in family groups (Chapman & Jones 2009; Jones 2011). Wild bird feeding may provide benefits to both the birds and the people feeding them, including: the pleasure associated with a connection to nature and wildlife, especially for urban dwellers; a way of attracting wildlife to one's house; a way of counteracting negative human impacts such as habitat destruction; an educative activity; a perceived benefit and assistance to wildlife or insight into the welfare of urban birds; and passionate engagement with and care for the welfare of birds (Howard & Jones 2004; Jones 2011).

1.2.5 Consuming birds

Birds have long played an important role in the diet of Indigenous Australians (Altman 1982; Walsh 2009). One Australian species, the Emu *Dromaius novaehollandiae* is farmed (O'Malley 1997), but exotic bird species, particularly domestic poultry, such as *Gallus gallus domesticus*, Japanese quail *Coturnix japonica* and waterfowl (Anseriformes), form an important component of the Australian diet (Foster 2009; Poultry Hub 2014). A variety of waterfowl and game birds are hunted for sport and consumption (Field & Game Australia 2012).

1.2.6 Indigenous culture and birds

Depictions of birds are abundant in Australian Aboriginal stories; Tidemann and Whiteside (2010) identified 116 species of birds in more than 400 stories across 106 language groups, revealing that Aboriginal people had knowledge of bird behaviour long before it was 'discovered' by ornithologists. 'Stories are part of the fabric of Aboriginal culture, often indicating expected cultural behaviour, but also account for plumage characteristics, calls, habitat, food, the relationships between Earth and extraterrestrial objects and interspecific behaviours of birds' (Tidemann & Whiteside 2010, p.153). However, the knowledge in these

8
stories is rarely linked with 'scientific' studies, despite its potential to contribute to our ecological and cultural understanding of Australian bird species (Tidemann & Whiteside 2010).

1.2.7 Social conflicts and birds

Not all interactions with birds are positive, and some human-bird interactions in Australia engender fear or dislike of birds among the people involved. For instance, farmers can be severely affected by birds; bird damage to the horticulture industry is estimated to cost nearly \$300 million annually (Tracey *et al.* 2007). Further, birds pose risks to aircraft by bird strikes (Australian Transport Safety Bureau [ATBS] 2009), seabirds take long-line fishing baits (Bomford & Sinclair 2002), exotic birds can act as environmental pests (Vertebrate Pests Committee 2007), and birds can be reservoirs and vectors of diseases which may affect other wildlife and livestock as well as humans (Bomford & Sinclair 2002). There are other direct conflicts with people too: swooping of people by Australian Magpies *Gymnorhina tibicen* (Jones 2008; Jones & Thomas 1998, 1999); damage to gardens (Jones & Everding 1991); damage to sports fields, buildings and communications equipment; window and mirror tapping; noise and fouling; and urban tree defoliation (Bomford & Sinclair 2002).

1.3 Defining the research paradigm

1.3.1 Origins of the research

Evidently, birds feature in the lives of a broad cross-section of Australian society, but little is known about Australian attitudes towards them or their loss. Most research on the processes leading to species becoming threatened has been conducted in the context of the natural sciences. However, the processes behind threats and subsequent recovery planning¹¹ are highly complex, often linked to social systems and require a multidisciplinary approach to interpret them. Understanding the probability of success of threatened species recovery efforts is essential to good wildlife policy-making¹² and requires a sophisticated understanding of decision-making processes. Combining an understanding of the economic, social, institutional

¹¹ 'Pulls together published data and expert opinion to specify threats to species, management priorities and the criteria for down-listing or delisting a species' (Schwartz 2008, p.282).

¹² 'A set of rational, explicit and specific goals and procedures' (Kellert & Clark 1991, p.18).

and biological aspects of recovery may allow wildlife managers to develop optimal investment models under different scenarios (Garnett & Possingham 2009).

This study of social values (Section 1.3.2) was conceived as one of two Australian Postgraduate Award Industry (APAI) PhD programs to be conducted under the Australian Research Council (ARC) funded project: 'Increasing the effectiveness and efficiency of Australian threatened bird conservation' (Figure 1.1). The second PhD program was to examine how institutional processes influence recovery planning and outcomes (Holmes 2012). Many of the concepts driving this study were conceived within a predominantly biological sciences/conservation biology framework. From the outset, the research objectives were framed in largely positivist¹³ terms: measures of social value were to be taken; the social importance of taxa was to be assessed at multiple spatial and temporal scales; and links between publicity and conservation performance were to be assessed.

Yet little was known about the role of social values in conservation decision-making processes. In framing this PhD topic as part of the larger ARC project, it was clear assumptions had been made that understanding the wider public's values for threatened birds was important to policy-making and conservation efforts for these birds. This chapter tries to 'unpack' some of the underlying assumptions. This requires: understanding what 'social values' means in the context of threatened bird conservation; ascertaining which social values are relevant to threatened bird conservation processes; identifying who holds relevant social values and whose values have most influence in this context; and investigating the role of social values in the conservation decision-making process. The latter includes how the social construction of taxa by conservation stakeholders influences prioritisation of taxa to be conserved.

Effective environmental research 'requires the ability to link propositions stated in the language of the natural sciences to propositions stated in the language of the social sciences' (Klausner 1972, p.335). Once it was established that the research was a study of the values,

¹³ A 'philosophical system recognising only that which can be scientifically verified or which is capable of logical or mathematical proof, and therefore rejecting metaphysics and theism' (Oxford Dictionaries Online 2014). *Positivists* are primarily concerned with establishing the fundamental patterns or relationships in social life (Blaikie 2000).

attitudes¹⁴, motivations and behaviours (Chapter 2) of those working in threatened bird conservation, as well as related characteristics of the general public, the entire project could be reframed within an interpretivist paradigm. According to Blaikie (2000, p.115):

'Interpretivism¹⁵ takes what Positivism and Critical Realism ignore - the meanings and interpretations, the motives and intentions that people use in their everyday lives and that direct their behaviour - and it elevates them to the central place in social theory and research.'

Therefore, this study is at heart social research *for* conservation biology which broadly aims to: '…increase understanding of human society in order to understand why, how, and when impacts on nature and biodiversity loss occur and what motivates people to engage in activities that harm or promote the conservation of biodiversity' (Sandbrook *et al.* 2013, p.1,487).

¹⁴ Positive or negative evaluations of something quite specific which often derive from and reflect abstract values (Dietz, Fitzgerald & Shwom 2005; Leiserowitz 2006).

¹⁵ Interpretivists argue that statistical patterns or correlations are not understandable on their own and always require interpretation. It is necessary to find out what meanings (motives) people give to the actions that lead to such patterns (Blaikie 2000).



Figure 1.1: Mind map situating the social values of Australian threatened birds PhD research within the broader ARC project. UQ = University of Queensland; CDU = Charles Darwin University; AWC = Australian Wildlife Conservancy; H.P. = Prof Hugh Possingham; S.G. = Prof Stephen Garnett; SHMB = Dr Stuart Butchart; TSC = BirdLife Australia Threatened Species Committee; CSM = BirdLife Australia Research and Conservation Committee.

1.3.2 The human dimensions of threatened bird conservation

A fundamental step in framing this research was to identify an appropriate interdisciplinary theoretical framework within which to conduct the inquiry. To achieve this, the research predominantly drew from the following:

- the social psychology research discipline (this Section);
- the theory of social constructionism (Section 1.3.3); and
- the human dimensions of wildlife research field (Section 1.3.4).

Social psychology is the branch of psychology that deals with social interactions, including their origins and their effects on the individual (Oxford Dictionaries Online 2013e). Of particular interest to this research is the study of human values and attitudes. It has been suggested the consequences of human values will be manifest in virtually all phenomena that social scientists might consider worth investigating and understanding (Rokeach 1973).

Rokeach devoted his life to studying the nature of human belief systems (Rokeach 1973). He submitted that: 'A value is an enduring belief that a specific mode of conduct or end-state of existence is personally or socially preferable to an opposite or converse mode of conduct or end-state of existence' (Rokeach 1973, p.5). His research indicated that the total number of basic values that a person holds is relatively small and all people everywhere possess the same basic values to different degrees. Values are organised into value systems and can be traced to culture, society, its institutions and personality (Rokeach 1973).

Values can be held at the level of individuals, groups and societies. Values shared across levels are sometimes referred to as 'social values' which can be described as: '...sets of ideals and beliefs to which people individually and collectively aspire and which they desire to uphold' (Jepson & Canney 2003, p.271). The importance of social values at a societal or group level differentiates them from attitudes, which originate from a process of individual consciousness (Kluckhohn 1962).

Values sit within a cognitive hierarchy and are influenced by culture and society through world views and beliefs, and in turn they influence attitudes and behaviours (Cary, Webb & Barr 2002). Culture and society are less changeable and more enduring than specific attitudes and behaviours. Values are often difficult to study directly and it can be difficult for an individual to articulate their values because they tend to be deeply held; rather, they are expressed in the form of attitudes and behaviours (Fulton, Manfredo & Lipscomb 1996; Kluckhohn 1962) (Section 2.1). Attitudinal studies in the social sciences generally attempt to examine relationships between behaviours, attitudes and values with the aim of attempting to predict behaviour from knowledge of attitudes and values or other social characteristics (Section 2.1.7).

1.3.3 Social constructionism

Social order is described as 'a human product or, more precisely, an ongoing human production' (Berger & Luckmann 2011, p.56). Our shared knowledge of the world is constructed through the daily interactions between people in the course of their lives so that what is regarded as the 'truth' may be thought of as current accepted ways of understanding the world (Burr 2003). As various interpretations and understandings of the world grow through the process of sharing knowledge with others, some patterns of social action are sustained and others marginalised or excluded - for example what is considered an acceptable level of industrial pollution in a country's waterways may change over time, requiring different action to be taken (Burr 2003). Burr (2003, pp.2-3) posits that:

'Social constructionism insists that we take a critical stance towards our taken-for-granted ways of understanding the world, including ourselves... It is therefore in opposition to what is referred to as positivism and empiricism in traditional science – the assumptions that the nature of the world can be revealed by observation and that what exists is what we perceive to exist.'

Soulé (1995) expands on the theory of multiple 'realities' of nature, by identifying nine concepts of 'living nature' co-existing in the modern world, described as: '...not changing over time, but accumulating layer upon layer so that the most scientific conceptions can co-exist alongside with the most pagan, even within the mind of a single person' (Soulé 1995, p.139). Further: 'these many "living natures" reflect the polymorphic, fragmented nature of human occupations and preoccupations in a civilisation that encompasses an extraordinary range of subcultures, levels of affluence, contact with natural habitats and philosophical sophistication' (Soulé 1995, p.141). In discussing the relationship between wildlife management and social constructionism, Hytten and Burns (2007, p.48) state: 'Wildlife management is based on a range

of assumptions about wildlife and expectations about nature¹⁶. As such, it can be seen as the result of the process of social construction.'

A social science inquiry, such as this one, cannot take the nature of reality and knowledge for granted because of the awareness that realities and knowledge pertain to specific social contexts, and that a wildlife manager's version of reality and knowledge will differ from that of a 'man in the street' (Berger & Luckman 2011). An example of this is the varying assumptions made by different sectors of Australian society about 'nativeness' of introduced flora and fauna (Trigger *et al.* 2007). For example, the Dingo *Canis lupus dingo* was introduced to Australia around 4,000 years ago and although many Australians perceive it to have significant cultural and intrinsic value, some question whether it ought to be treated as a native species, partly because its ecological role here is not well established (Fleming, Allen & Ballard 2012). Another example of social construction can be found in the use of specialised vocabularies by experts. To illustrate, terms such as 'rare', 'threatened' and 'pest' when used in the context of conservation biology allude to the status of individual species, whereas they may be interpreted quite differently by those using them in the context of everyday language.

1.3.3.1 Individuals, roles and institutions

According to social constructionism, it is important to distinguish between the individual, their role and the institution they represent. This is because of the complex social processes involved in socialisation and acculturation, since they directly influence the development of an individual's identity and attainment of knowledge (Berger & Luckmann 2011). Although individuals regularly express their attitudes in the course of everyday conversations, the cognitive process they carry out in order to do so is not a simple one. The cognitive process involves evaluating an experience by examining basic beliefs about it. The beliefs themselves and the strength of these beliefs will differ in a given situation (Ajzen 2012a; Manfredo 2008). Therefore, although attitudes may be held towards an object or experience, they are not automatically expressed; they require some consideration.

¹⁶ The phenomena of the physical world collectively, including plants, animals, the landscape and other features and products of the earth, as opposed to humans or human creations (Oxford Dictionaries Online 2013f).

Also, an individual may try to fit their beliefs into '…a consistent biographical framework. This tendency increases as the individual shares with others his meanings and their biographical integration…' (Berger & Luckmann 2011, p.68). This is carried out through a process that social constructionists refer to as the creation of particular 'subuniverses' of meaning which lead to different perspectives on society by different expert groups (Berger & Luckmann 2011). For instance, a biological scientist's perspective on threatened bird conservation may differ greatly from that of a social scientist's. The increasing complexity of subuniverses can make them increasingly inaccessible to outsiders (e.g. lay people) (Berger & Luckmann 2011).

1.3.4 Human dimensions of wildlife research

Values held for threatened birds can be viewed as a specific subset of broader social values about wildlife. Much recent wildlife values research derives from the United States of America (USA) (Jones 2000; Manfredo 2008; Vaske & Manfredo 2006; Vaske, Shelby & Manfredo 2006). This research emerged from an '...egalitarian conscience (which) reminds us that the public is the owner of wildlife, that professionals manage wildlife in trust for people, and that our accountability is to both wildlife and people' (Vaske, Shelby & Manfredo 2006, p.79). Members of the USA's wildlife management profession recognised the enormous rate that wildlife and its habitat were being eliminated through activities such as deforestation and intensified agriculture and wanted to demonstrate the value of wildlife to an apparently oblivious, profitdriven society. They sought to find out if the values of wildlife justified the cost to conserve it and, through early attitudinal research, they described a wide array of economic and social benefits derived from the presence and recreational enjoyment of wildlife (Manfredo 2008).

As a result, and because of pressure to clarify and quantify these benefits, empirical, socialpsychological approaches have been applied to measuring attitudes and values for wildlife. In the USA, this has led to the development of the research field now termed 'human dimensions of wildlife' (HDW) (Manfredo 2008; Vaske & Manfredo 2006; Vaske, Shelby & Manfredo 2006). Broadly speaking, HDW research typically examines social values; knowledge and behaviours associated with wildlife; and wildlife management issues (Jones 2000; Miller 2009; Vaske & Manfredo 2006; Vaske, Shelby & Manfredo 2006). Chapter 2 discusses HDW research in Australia.

1.3.5 Eurocentrism, experts and privileged knowledge

Social constructionism encourages us to consider that our perception and understanding of the world are historically and culturally specific (Burr 2003), so it is helpful to remind ourselves of how Australia's current conservation policies and laws came into being.

In the early days of European colonisation, new settlers from Great Britain experienced the vastness and dangers of Australia with awe and little appreciation of their own impact upon the country (Franklin 2007b). Accounts of expeditions describe the limitless numbers of birds encountered and shooting as many of them as possible seemed appropriate in an exotic land (Franklin 2007b). The scale of shooting by early colonists did not go unnoticed. The first laws to limit hunting were enacted on Norfolk Island in 1798 (Bonyhady 2000) and the newly formed government in Tasmania created Australia's first bird protection laws in the 1860s (Hutton & Connors 1999). However, these tended to focus on protection of introduced game birds and the inclusion of native birds was a secondary consideration (Stubbs 2001). Later in the nineteenth century, the Birds Protection Bill 1881 was introduced in New South Wales to protect native game birds, including the Emu Dromaius novaehollandiae, Black Swan Cygnus atratus and Lyrebird Menuridae spp., and other native birds, such as the Australian Magpie Gymnorhina tibicen, Lapwing Vanellus spp., Willie Wagtail Rhipidura leucophrys, Riflebird Ptiloris spp. and Regent Bowerbird Sericulus chrysocephalus (Stubbs 2001). In 1901, the newly formed Royal Australasian Ornithologists Union (RAOU) pursued the banning of fashion trades deemed harmful to some native bird species, becoming the 'first organised environmental activity to pierce the Australian consciousness about a particular environmental threat' (Hutton & Connors 1999, p.5).

The transition towards developing an Australian 'sense of identity' ultimately involved colonists starting to value the native wild animals that could be 'saved, restored, conserved and privileged' over introduced European species (Franklin 2006). Eurocentric beliefs, practices and ideologies were becoming privileged over those of Indigenous inhabitants, laying the foundations for aspirations to dominate and control nature and wildlife and the perception of wildlife as a resource to be 'managed' (Howitt & Suchet-Pearson 2006). The idea of management in the context of nature and wildlife is:

'...intimately woven into the twin Eurocentric notions of development and (biodiversity) conservation, both of which assume not only separation between society and nature, between human and non-human animal... but also superiority of society and humans over nature and animals. It is these ontological assumptions that admit the possibility of human intervention into, management of and control over natural systems' (Howitt & Suchet-Pearson 2006, p.324).

Despite deep-seated colonial links with Europe, Australia's culture has long been influenced by that of the USA, particularly in regard to conservation and wildlife management practices. Indeed, the conservation movement in Australia progressed in much the same way as in North America, with the gazetting of national parks designed to preserve 'pristine' landscapes (Mulligan 2001). Conservation strategies in Australia and the USA developed in close alignment. This may be partly due to an affinity between Australia and the west coast of the USA. Both were 'frontier societies' when the conservation movement began, with what could be described as 'unregulated and unrestrained subsistence and commercial exploitation of an open-access commons on a national scale' (Callicott & Grove-Fanning 2009, p.319) and John Muir's ideas held great appeal to early Australian conservationists (Mulligan 2001). Australia is said to share with the USA: '...a rational tradition and a preservationist ideology that identifies and seeks to preserve "pristine wilderness." The former has underpinned both a culture and economy of resource exploitation, the latter an ideology of preservationism that resists human-induced change' (Adams & Mulligan 2003, p.8).

This combination of factors has led to what Mulligan describes as a 'problematic conservation legacy' in Australia which:

'...fosters a conceptual separation of people and "pristine" nature and a nature/culture dualism, and a heavy reliance on scientific expertise and rational arguments for conservation which alienate many people and reinforce a widespread view that conservation is for "experts" and "fanatics"' (Mulligan 2001, p.25).

The Australian Government indirectly acknowledges Mulligan's view in 'Australia's Biodiversity Conservation Strategy 2010-2030'. The Strategy's principal 'Priority for Action' is 'Engaging All Australians' which asserts:

'All Australians must take responsibility for biodiversity conservation. Engaging all Australians is fundamental if we are to succeed in building ecosystem resilience in a changing climate... Mainstreaming biodiversity requires a transformation in the way most people think about and value biodiversity' (Natural Resource Management Ministerial Council [NRMMC] 2010, p.33).

However, the Strategy offers neither advice about how Australians are currently understood to 'think about and value biodiversity', nor about which thoughts and values might be appropriate for a society in which biodiversity is 'mainstreamed'. Hence, a fundamental component of the process of *engaging all Australians* is to better understand which key sectors of society are currently engaged in biodiversity conservation and what public attitudes and values might be with regard to biodiversity and its conservation. Therefore, this research is concerned with the values and attitudes of individuals engaged in the conservation of threatened birds and those of the general public. These individuals are situated within society and operate within a broad governance landscape where western science is usually deemed to be the 'universally relevant source' of appropriate principles and practices for managing environmental programs: 'Both conservation and development discourses... impose and privilege Eurocentric beliefs, practices and epistemologies through an ontological authorisation of systems of resource management, environmental management, wildlife management and community management' (Howitt & Suchet-Pearson 2006, p.324).

The 'experts' that Mulligan refers to include the many different types of scientists working within the field of conservation biology¹⁷. Over-emphasis on expert-led science as a way of delivering conservation goals may conceal some values and accentuate others (Jepson & Canney 2003) (Section 1.3.3.1). A broad reliance on scientific expertise is evident in the

¹⁷ A multidisciplinary science that attempts to bridge the gap between theories in ecology and population biology and conservation science and practice, and is dependent on biological and social science disciplines (Soulé 1985).

conservation community's long dependence on the biological sciences to inform policy and practice (Mascia *et al.* 2003). However, there is a growing realisation that social factors are the primary determinants of conservation success or failure; conservation interventions are the product of human decision-making processes and therefore changes in human behaviour are required if they are to succeed (Clark & Wallace 1998; Leiserowitz, Kates & Parris 2006; Mascia *et al.* 2003; Schultz 2011; Soulé 1985).

1.3.6 Conservation policy and law in Australia

Further evidence of Mulligan's view that formal conservation is largely restricted to experts can be found in contemporary Australian conservation policy and law as framed by the governments of the various Australian jurisdictions. Rather than being integrated into all government policies and departments, protection of the environment is divided into sectors so responsibility usually falls to individual experts operating within government departments managing multiple related portfolios, such as the Australian Government Department of the Environment (DoE). DoE, and similar departments in each state and territory, have specific legislation aimed at protecting the natural environment and threatened species. The Commonwealth legislation is the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act 1999). Under this Act, nationally-listed threatened species are considered a 'matter of national environmental significance' which gives effect to Australia's obligations under the Convention on Biological Diversity and means that the Commonwealth Environment Minister is obliged to consider impacts on threatened species (Godden & Peel 2007). Many other Acts administered by each state, territory and the Commonwealth contain provisions which relate to the protection of the environment, natural resources and/or wildlife and thus have relevance to threatened species (Garnett, Ainsworth & Carey 2007).

However, integration of environmental legislation across governments to mitigate threatening processes is difficult, rare and may lack a natural constituency who will advocate for its assimilation (Garnett, Ainsworth & Carey 2007). The difficulty is that because the issues are typically framed as principally biological or ecological rather than social, specialisation in the biological sciences is usually required to acquire the knowledge deemed appropriate to identify and manage threatened species and ecological communities. Unless integration is

institutionalised, that specialisation tends to remain within the departments administering the legislation seen to be most directly relevant to the subject matter in question. This means that if a threatened species is listed under state or territory legislation but not under Commonwealth legislation, knowledge of that species and its management may rest with one or two individuals within a single government department in a given state or territory (Garnett, Ainsworth & Carey 2007).

Sometimes the same government department is charged with responsibilities that are, to some extent, incompatible, and different departments within the same jurisdiction may have mutually incompatible goals. Hence, just as an individual may hold incompatible opinions, society may have incompatible laws. This is an example of 'cognitive dissonance' at the institutional level (Festinger 1962). To illustrate, society's requirements for multiple uses of protected areas and consideration of multiple values means that those wishing to conserve cultural or natural values may not always be supported by legislation. Resource extraction provides a prime example where provisions in state government mining legislation may override provisions in environmental legislation. This can allow mining to occur in or near protected areas, such as the Jabiluka uranium mine which is surrounded by the Northern Territory's World Heritage listed Kakadu National Park (Department of the Environment [DoE] 2011).

Under current Western conceptions of wildlife management as a 'public good', biodiversity conservation is primarily the responsibility of government and operates by and large as a function of public policy. Along with policy implementation, for example through environmental legislation, this can be seen as an expression of the value contemporary society places on conservation. The fact that relevant conservation legislation and policies exist, as well as Australia's membership of several international conservation agreements (e.g. the Convention on Biological Diversity), suggests that Australian society places a value on biodiversity and the recovery of threatened species.

However, Australia's Commonwealth and state environmental legislation has been criticised as being ambiguous in its prescription of conservation objectives because there is no clearly defined recovery objective in the legislation, statutes or policy (McCarthy, Thompson & Garnett 2008). Implementation of the Commonwealth *EPBC Act 1999* exemplifies how threatened

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species conservation is managed inconsistently and sometimes 'lacks teeth' to follow through on conservation action. For example, although there is provision in the Act for the Commonwealth Environment Minister to recommend the implementation of a recovery plan for each species listed under the Act, there are no legislative requirements to establish a recovery team (pers. comm. Latch 2011). Due to competing priorities and limited resources, this inevitably results in recovery actions for only high priority species being allocated funding.

Setting priorities for developing recovery plans for individual threatened species may be decided formally at a state government level, sometimes by assessing 'social values' as in the Queensland Government's 'Back on Track' species prioritisation process (Department of Environment and Heritage Protection [DEHP] 2013a). In this context, social values are one of three sub-criteria relating to consequences of extinction. The criteria are assessed by a panel of technical experts with knowledge of a particular taxonomic group for each threatened species listed under the *Nature Conservation Act 1992* (DEHP 2013b). Here, the social values criterion assesses both the intrinsic and instrumental values of species (Section 1.3.8.1.1), and a species deemed to be of high social value to the mainstream community is scored more highly than a species which is generally unknown to the wider community (DEHP 2013b). Alternatively, species prioritisation may occur informally based on the values and research interests of individual research 'champions' or staff tasked with their management.

1.3.6.1 Legal rights of species

The moral argument for conserving nature is far from new. In comparing the 'enslavement' of nature with the 'enslavement' of people, environmental advocates have been drawing parallels with the abolitionist movement since at least the 1850's when Henry David Thoreau pointed to 'ethical myopia' as the common cause of both human slavery and the abuse of nature (Nash 1989). Significant progress has been made in recent years by countries, such as Ecuador and Bolivia, and international organisations, such as the IUCN and United Nations General Assembly, to recognise and advance the inherent legal rights of nature (Sheehan, Cullinan & Mackey 2013). Many non-human animals in western societies have a degree of moral status sanctioned by law (Milton 2002) and so these attitudes may be on the rise in western nations.

It has long been proposed that individual 'species' have moral rights, despite the fact that species are socially constructed entities for which scientists offer several definitions (Garnett & Christidis 2007; Sandler 2012; Wilkins 2010) (Section 1.3.6.1). Pioneering environmentalists, John Muir and Aldo Leopold, broached the concept of species' rights in their seminal essays on nature (Callicott & Grove-Fanning 2009). More recently, Rolston framed the moral argument for conserving threatened species in light of their instrumental value to humans (Rolston 1985).

Sandler (2012) suggests that humans require an 'ethic of species' because we have the power to cause mass extinctions, among other things, and that an account of the value of species is central to such an ethic. To illustrate, scientists sometimes refer to 'higher' or 'lower' organisms when describing their position on the evolutionary scale; there is an argument that humans have a psychological need to position themselves and similar organisms, such as large animals, at the top of the moral hierarchy with microbes and those least similar positioned at the bottom (Nee 2005; Mogie 2007). The fact that some scientists actively pursue the extinction of some biota to benefit humans, such as pathogens like smallpox Variola, suggests that humans perceive such biota to have a lower moral standing than more highly valued organisms (Brandt & Reyna 2011).

1.3.6.2 Political support for conservation

Today, threatened species are imbued with moral rights through their listing in environmental legislation. Yet there is much evidence to demonstrate that other considerations which are deemed to benefit the economy, such as development or resource extraction, are prioritised over threatened species protection (Allchin, Kirkpatrick & Kriwoken 2013), reinforcing the idea that threatened species are perceived 'by those making the moral judgement' to have a lower moral standing than humans (Brandt & Reyna 2011).

Australian government policies and processes have been described as shifting in the last decade from environment and heritage conservation towards facilitating developments and catering to development interests (Allchin, Kirkpatrick & Kriwoken 2013; Godden & Peel 2007; Kirkpatrick 2011). Further, 'a tension between species conservation and economic growth... has hindered the achievement of the national biodiversity conservation goal' (Kirkpatrick 2011, p.281). Political support for economic liberalism and political conservatism correlate with anti-

environmental views (Milfont 2012) and, within days of assuming government in September 2013, the new conservative Australian Coalition Government signalled a diminishing investment in conservation in place of increased production (Kenny 2013; Liberal Party of Australia 2013; Lloyd 2013; Whitmore & Minchin 2013).

1.3.7 Threatened species stakeholders

Considering that birds seem to feature in the lives of so many Australians (Section 1.2) there are many potential stakeholders¹⁸ with varying interests and types of knowledge who could be involved in their conservation. Aslin and Brown (2004) described four 'knowledge systems' to represent the diversity of knowledge, experience and expectations of different types of stakeholder groups:

"Local knowledge": the local reality based on the lived experience in the region, built through shared stories, memories of shared events and locally-specific relationships between people and places. "Specialised knowledge": the collected advice from a wide range of experts, including geologists, ecologists, economists, engineers, sociologists etc., each constructed within a particular knowledge framework or paradigm. "Strategic knowledge": the tactical positioning of people and resources for future action within given political and administrative systems. "Integrative knowledge": the mutual acceptance of an overarching framework, direction or purpose, derived from a shared interpretation of the issues' (Aslin & Brown 2004, p.7).

Broadly speaking, in this context two main classes of stakeholder can be identified: those with sufficient specialised knowledge to interpret relevant scientific and technical data, and those without (Opotow & Weiss 2000). The former may have considerably more power than the latter despite the fact there is a widely recognised continuum of structured opportunities for the public, who do not necessarily have the relevant specialised knowledge, to participate in government-led processes to identify and solve social problems (Head 2007). To illustrate, relationships between conservation scientists and landholders are sometimes problematic,

¹⁸ 'Anyone who has an interest in an issue, whether that interest is financial, moral, legal, personal, community-based, direct or indirect' (Aslin & Brown 2004, p.4).

since they may see the same species or landscapes quite differently (Burgess, Clark & Harrison 2000). The extent to which different knowledge, experiences and actions can be integrated in a management scheme depends on the abilities of the different stakeholders to accommodate and make sense of each other's worlds. From the conservation scientist's perspective, landholders need to be persuaded of the truth of the scientists' account and their prescriptions for future management. From the landholder's perspective, the conservationists need to value more the depth of local experience and knowledge they bring to the process (Burgess, Clark & Harrison 2000).

Another good example is the inequity in power and influence in conservation of heritage places whereby:

'...an over emphasis on "scientific" significance or values (e.g. biodiversity, archaeology) in the identification of conservation priorities... has meant that Australian community groups... have had to develop an increasingly sophisticated grasp of scientific jargon to secure the conservation of places of value to them' (McIntyre-Tamwoy 2004, p.292).

This implies that the power to influence conservation efforts mainly lies with those currently deemed by society and government to be 'appropriate' knowledge experts.

1.3.7.1 Stakeholder trust and collaboration

Power and respect may be described as:

'...paramount values at stake for individuals in the design and execution of authoritative decision-making... in the longer term, value dynamics that indulge the few at the expense of the many can erode the very bases for civil society and human dignity' (Mattson, Karl & Clark 2012, pp.248-249).

The power to influence conservation policies and practices may depend on the level of mutual trust existing among different stakeholders and the capacity of those stakeholders to engage in a meaningful way. The concepts of trust and control are inversely related, implying the less trust there is between stakeholders, the more control will be exercised and vice versa (Inkpen & Currall 2004). Sometimes this can benefit the conservation process. However,

overemphasis on protective controls can hinder collaboration because it prohibits the partners from developing mutual commitment to the relationship (Inkpen & Currall 2004).

Prior experience with an issue is a critical factor in the success or failure of participation in the policy development process since it may enable participants to exert more control over the participation process: 'Meaningful discourse (i.e. discourse that adds to participants' understanding of an issue) is an essential process element for achieving the goals of incorporating public values in decisions, raising the substantive quality of decisions and resolving conflicts' (Alberts 2007, p.2,346). However, participants without sufficient experience in the subject matter may be unable to engage in meaningful discourse or participate effectively in the decision-making process (Alberts 2007).

1.3.8 Values and advocacy in threatened species conservation

Advocacy for particular species, groups of species or conservation actions is prevalent within both the scientific and public sectors (Bowen-Jones & Entwistle 2002; Chan 2008; Garnett, Crowley & Balmford 2003; Seddon, Soorae & Launay 2005; Smith & Sutton 2008; Trimble & Van Aarde 2010; Veríssimo 2007; Veríssimo, Macmillan & Smith 2011; Weston 2006; Yarwood 2012). An individual scientist's values can influence their science through the questions they ask and the kinds of evidence they use (Chan 2008). People may hold many different values from believing in the intrinsic value of species to supporting instrumental¹⁹ values of species for their benefit to humans (Sandbrook *et al.* 2011; Sandler 2012). These kinds of biases can influence threatened bird conservation decision-making processes and are therefore discussed briefly below.

1.3.8.1 Scientists' values

An uneasy relationship is thought to exist between the culture of scientists and 'a real love of nature', but many conservation biologists admit to being driven by a deep passion for wild places and for biodiversity conservation (Toussaint 2005). The empathy gained during field

¹⁹ An entity has value because it is a means to human ends (Dietz, Fitzgerald & Shwom 2005; Sandler 2012).

research has been described as '...central to the identity of conservation biologists and to the integrity of the discipline' (Noss 1996, cited in Toussaint 2005, p.389). Indeed, Noss contends:

'Empathy for living things comes from many years of observing them in their natural environments, which is why field biologists have always been among the most adamant defenders of wild Nature. Some would call this experience-based conservatism emotional and biased; I would call it prudent and precautionary' (Noss 1996, p.2).

1.3.8.1.1 Intrinsic and instrumental value

In conservation biology 'intrinsic value' is typically applied to certain species or ecosystems, for example, in terms of them having 'value independent of the values humans assign to them' (Dietz, Fitzgerald & Shwom 2005, p.340). Chan (2008) suggests that conservation itself is an expression of the perceived inherent value of biodiversity as a 'protected value' that cannot be traded off with other (instrumental) values such as human well-being or human rights, and that scientists should be explicit about holding intrinsic value, especially when asking others to accept costs for the sake of biodiversity and the public good.

Kellert argues for instrumental value:

'...extinction would be regarded not just as a reduction in biological options for coping with an uncertain future but, more importantly, as a reduction in the aesthetic, cultural, and spiritual opportunities humans crave in their quest to make life more meaningful and worthwhile' (Kellert 1985a, pp.535-536).

There has been some debate about whether arguing for the intrinsic value of non-human species is the best ethical basis for conserving nature, as compared with instrumental value. One perspective is that stressing a species' intrinsic value does not tend to muster the attention needed to translate concern into conservation action. This is because contemporary conservation decision-making requires trade-offs due to large numbers of threatened taxa; limited funds and personnel to administer environmental legislation; and political and legal pressures to list particular species as threatened. Nor does an argument for intrinsic value tend to take priority over competing socio-economic demands, because potential conservation benefits are likely to be set aside in favour of those more easily calculated in familiar terms, such as dollars (Kellert 1985a; Maguire & Justus 2008). Another major difficulty in assigning

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intrinsic value to an entity is that there is no widely accepted method for systematically quantifying the intrinsic value of any entity other than by asking people about the values they assign to it (Dietz, Fitzgerald & Shwom 2005). Further, attributions of intrinsic value to biological entities have been criticised for failing to provide workable criteria for determining which entities are intrinsically valuable and hence are not considered amenable to the kind of evaluations required for species prioritisation in conservation decision-making processes (Maguire & Justus 2008; Justus *et al.* 2009).

This suggests that not all entities are intrinsically valuable, but since biological entities are products of biological evolution, extrinsic (instrumental) and intrinsic values are thought to share a common origin; extrinsic values are said to derive from intrinsic value and 'life mutely expresses both' (White 2013). Following this line of reasoning, intrinsic value ought therefore to carry more weight than extrinsic value within society's decision-making processes.

1.3.8.1.2 Valuing threatened species

Broadly speaking, whether or not species are assigned instrumental and/or intrinsic value, there are differing views about what other sorts of more specific values species may be assigned and the bases on which they are assigned (Sandler 2012). The term 'species' itself is problematic because 'the definition of species is at once one of the most fundamental and one of the most ephemeral concepts in biology' (Garnett & Christidis 2007, p.187). There is no universally accepted definition, but rather a host of competing species concepts (Garnett & Christidis 2007; Sandler 2012; Wilkins 2010). These multiple concepts are partly explained by the fact that the species concept is highly specialised, contested and socially-constructed in different ways by those working in the many different fields of biology (Garnett & Christidis 2007; Sandler 2012; Wilkins 2010) and is hence subject to issues of framing (Section 2.1.14). Public concern for biodiversity loss is often perceived to be primarily the concern for loss of species (Garnett & Christidis 2007). However, understandably, the species concept itself may not always be well understood by the public. Policy-makers and legislators are also observed to strongly believe in the species concept by adopting it in legislation and Red Listing (Garnett & Christidis 2007).

Often, conservation research focuses on threatened species listed in legislation rather than on common or non-threatened species, and on mammals and birds as opposed to plants and

invertebrates (Seddon, Soorae & Launay 2005; Trimble & Van Aarde 2010). The direction of conservation efforts may be influenced by a perceived need to spend limited research funds in the most cost-effective way, i.e. larger populations of threatened species are easier to study than rare and elusive populations and may provide more robust results (Seddon, Soorae & Launay 2005). Also evident is a tendency for a geographic bias in research focus towards areas where there are more people to act as observers, and the preoccupation of some researchers with one group of birds over another (Weston 2006; Yarwood 2012). For instance, according to a content analysis of *Emu²⁰* between 1901 and 2011, overall ornithological research effort in Australia is biased in this way. Only five out of 23 orders of Australian birds have 'complete' representation in terms of research publications, possibly due to the location and activities of universities and local interest groups, bird density or accessibility of study areas (Yarwood 2012). Biases can change over time and are correlated with 'technological, theoretical, social and institutional changes, and suggest ornithological priorities, like those of other scientific disciplines, are temporally labile' (Yarwood, Weston & Garnett 2013, p.1)

Within threatened bird conservation research, a slight taxonomic bias towards particular families of birds exists, including: Anseriformes (waterfowl), Falconiformes (raptors), Gruiformes (cranes, crakes and rails) and Galliformes (game birds) (Seddon, Soorae & Launay 2005). It even occurs within families, such as waders (e.g. oystercatchers *Haematopus* spp.). Non-migratory shorebirds appear to be neglected in favour of migratory species in terms of research and conservation efforts (Weston 2006). Taxa that have larger population sizes, live further from the equator, and migrate furthest are more likely to be studied than those that do not (Thomas, Szekely & Sutherland 2003).

²⁰ Official journal of the RAOU, now BLA.

The Project Prioritisation Protocol (PPP) which aims to improve conservation outcomes for threatened species in general (also known as 'conservation triage'²¹) recommends that species encompassed within a project under consideration for conservation investment are weighted by instrumental values such as 'cultural significance', 'economic importance', 'evolutionary significance', 'ecological function' and 'endemicity' (Game, Kareiva & Possingham 2013; Joseph, Maloney & Possingham 2009; McCarthy & Possingham 2012; Possingham 2002). Not surprisingly, due to the predominance of the natural sciences in contemporary conservation programs, instrumental values identified by these authors focus heavily on ecological and biophysical characteristics. It is unclear exactly what is meant by 'cultural significance' hence it is difficult to understand how taxa are currently prioritised under this category.

In contrast with the 'Back on Track' process (Section 1.3.6) the PPP does not consider a taxon's non-use or intrinsic value.

1.3.8.1.3 Scientists and policy

Another consideration is beliefs about the proper role of science and scientists in policy deliberations, and there is much debate in the literature about whether, and how, scientists should contribute to the policy process (e.g. Lackey 2007; Holmes & Clark 2008; Martin-López *et al.* 2009). Post-modernists²² argue that since all science is socially constructed, science is value driven and therefore normative²³. However, Soulé and Lease (1995) counter by claiming that individual scientists cannot escape from their values or from their expectations about reality and this criticism 'sticks' only to scientists and not to science, which as an institution is 'self-corrective'. The debate about whether scientists should advocate for particular policy decisions is further complicated by the distinction between advocacy for conservation values and

²¹ The concept of triage arose in the medical arena and was used during World War I where the aim was to save the most lives with the limited medical resources available. The term conservation triage is analogous to medical triage, but also reflects the fact that not all species are valued equally (McCarthy & Possingham 2012).

²² A late 20th-century style and concept in the arts, architecture, and criticism, which represents a departure from modernism and is characterised by the self-conscious use of earlier styles and conventions, a mixing of different artistic styles and media, and a general distrust of theories (Oxford Dictionaries Online 2013g).

²³ 'Science developed, presented, or interpreted based on an assumed, usually unstated, preference for a particular policy or class of policy choices' (Lackey 2007, p.13).

conservation trade-offs (Chan 2008). Since policies have multiple impacts they usually involve trade-offs between values held by different groups. Weighing up the trade-offs and making decisions about the best course of action may be beyond the bounds of biological science and, it can be argued, should be decided by wider society (Chan 2008). Chan suggests that conservation biologists should advocate for some values (e.g. biodiversity) but that they must justify that advocacy by explicitly proclaiming the inherent value of biodiversity without simultaneously advocating against other values. Only in this way might those who do not share an appreciation for biodiversity begin to value it for themselves (Chan 2008).

Despite the clear biases described above, relatively little is known about the values biological scientists hold for biodiversity or the role of these values in the conservation decision-making process (Section 1.4).

1.3.8.2 Public values

An international trend towards more participatory governance has become apparent recently in some western nations, so that governmental decision-making seeks to emphasise processes for inclusion of broad constituencies and disadvantaged groups (Head 2007). This involves a 'renewed focus on dialogue between government and citizens and deliberation among stakeholders in the process of deciding priorities and actions' (Head 2007, p.442). This participatory approach seems partly due to a need to share responsibility for resolving complex social and environmental issues as well as an increasing appreciation of the benefits of involving local citizens in identifying problems and contributing to solutions (Head 2007). Nevertheless, government institutions tend to retain control of decision-making processes through funding, service contracts and regulation (Head 2007).

The success of conservation strategies may depend on acceptance by the public, who may be expected either to finance a strategy via government spending or otherwise tolerate the restrictions that are frequently associated with conservation interventions (Hunter & Rinner 2004). Even so, politically interested and engaged citizens may play an active role in shaping policy and the policy context through modifying their own behaviour in light of environmental concerns, supporting pro-environmental policies and voting for environmental political parties (Tranter 2012). Environmental issues are thought to receive a high degree of public support in

Australia. National issues are typically considered more important by the general public than local or global issues, and younger people are more likely to join protest-based groups, while older people are more active in environmental groups (Tranter 2010, 2011). However, Australians often act locally to preserve places and species they consider important, and are prepared to modify their own behaviour to do so. To illustrate, in 2013, in response to extensive public consultation, Parks Victoria²⁴ announced that dog walking in Mornington Peninsula National Park would be restricted to protect native wildlife including 26 species of threatened birds (Context 2013; Parks Victoria 2013b). Two groups of interrelated attitudes were expressed by the public in the various letters and petitions submitted. Largely, opponents of dog walking put the needs of wildlife before those of dog walkers, citing the perceived impact of dogs on birds, other wildlife and the environment, and the significance of a population of threatened Hooded Plovers. Dog walking supporters mostly placed their own needs, and the perceived needs of their dogs, before those of wildlife.

There is a variety of private sector stakeholders representing business and industry that may be affected by conservation efforts. Some of them contribute to threatening processes and may represent the major extractive industries, such as forestry and mining. Companies to which private sector stakeholders belong, sometimes support conservation research and conduct land restoration projects to replace habitat diminished by their activities (e.g. Alcoa 2012). Further, companies may be required to 'offset' an area of native vegetation to mitigate the impacts of land clearing upon the extent and condition of native vegetation overall (Gibbons & Lindenmayer 2007). However, key information about the range and influence of these different stakeholders and companies, and the values they hold for conservation, is often unknown.

Environmental non-government organisational (ENGO) values can also be influential in supporting conservation efforts. For instance, BLA has some lobbying power and the capacity to recruit and train skilled volunteers through successful programs such as the 'Threatened Bird Network', 'Atlas of Australian Birds' and 'Shorebirds 2020', as well as a range of 'flagship' recovery projects such as the Carnaby's Black-Cockatoo Recovery campaign. These programs

²⁴ The state of Victoria's statutory authority with responsibility for managing and protecting Victoria's state-owned park network (Parks Victoria 2013a).

are typically funded by the public through research contracts and grants, donations, subscriptions and bequests (BirdLife Australia 2011), yet little is understood about why some species receive greater conservation investment than others by such organisations, or how they communicate their values to policymakers and the public (Section 1.4).

1.3.8.3 Flagship and rare species

Certain types of biodiversity tend to attract disproportionate amounts of public attention, such as tigers *Panthera tigris* and elephants Elephantidae spp., or a species may develop a high public profile as a result of being the subject of political controversy. The mass media have, in some cases, made positive contributions to public knowledge and concern about wildlife (Franklin & White 2001). However, research suggests that, while the public may possess some general wildlife knowledge, individuals are typically unaware of scientific details, so processes that lead to species decline are often wrongly attributed (Hunter & Rinner 2004; Hunter, Rinner & Weiner 2002).

'Flagship species' are one of several potential framings for wildlife-related work focusing on single species; other framings may be in terms of the species involved being biodiversity indicators (Section 1.2), rare or threatened species (Section 1.3.8.1.2), umbrella species²⁵, focal species²⁶.

'Flagship' species are defined as 'charismatic species that serve as a symbol and rallying point to stimulate conservation awareness and action' (Heywood 1995, cited in Caro *et al.* 2004, p.63). They are commonly used by conservation organisations to brand their organisation, raise awareness and motivate public support (Leader-Williams & Dublin 2000). Use of a flagship species to spearhead a conservation campaign can be a valuable way of obtaining public support for a range of other relevant species (Bowen-Jones & Entwistle 2002; Smith & Sutton 2008; Verissimo, Macmillan & Smith 2011).

²⁵ 'A species whose conservation is expected to confer protection to a large number of naturally co-occurring species' (Roberge & Angelstam 2004, p.1).

²⁶ Species used to define different spatial and compositional attributes that must be present in a landscape to meet the management requirements of other species present (Lambeck 1997).

Use of the term 'flagships' tends to fulfil a socio-economic role in public relations and fundraising circles, and a species' potential to be a flagship is dependent on its individual attributes and characteristics and how these are publicised (Johnstone 2011). Selection of a flagship species often depends on the values and goals of the agency conducting the conservation effort and their intuition about public interests in the area where those efforts are being conducted (Home *et al.* 2009). Research about the efficacy of framing in terms of flagship species to educate and engage the public is limited (e.g. Bowen-Jones & Entwistle 2002; Entwistle 2000; Smith & Sutton 2008) while research on the use of bird species as flagships is relatively scarce (e.g. Veríssimo 2007; Veríssimo *et al.* 2009).

In conservation biology, 'rare' species may be defined using several criteria, including numerical abundance or frequency of occurrence at a spatial scale and geographic range, while some base rarity on a prior listing in relevant legislation as 'endangered', 'threatened' or 'of concern' (Pritt & Frimprong 2010). Rare species, such as those closest to extinction tend to receive most conservation funding (Garnett, Crowley & Balmford 2003). For example, there are estimated to be only 50 individuals of the critically endangered Orange-bellied Parrot *Neophema chrysogaster* existing in the wild and significant amounts of funding and other resources have been invested in trying to prevent its extinction (Section 6.1.2.2). However, there has been little assessment of whether conservation action for rare species has been effective (Garnett, Crowley & Balmford 2003). It is unclear whether the perception of rarity among those acting to conserve rare threatened birds is sufficient to influence attitudes and behaviour that lead to effective conservation action and, if so, which characteristics of rare birds are important to their conservation.

1.3.9 Threatened bird conservation policy framework

Now that the social landscape for threatened bird conservation has been sketched out, this section discusses how this landscape may be interpreted by means of a wildlife policy framework, such as that described by Kellert and Clark (1991).

Threatened species conservation in modern western societies such as the USA and Australia operates within a wildlife policy framework. Rather than being a simple set of rationally derived and explicit goals that individuals and organisations faithfully implement to solve problems, the

policy process involves: '...significant non-rational and subjective elements as limits of information are encountered, selective interpretations of reality occur, embedded values and vested interests exercise their influence, biased preferences surface, and ideological allegiances are revealed' (Kellert & Clark 1991, p.18).

The wildlife policy framework consists of interactive relationships between various constituencies which exchange information, values and efforts to manage wildlife. Four major systems seem to drive this paradigm, representing: knowledge of the wildlife resource (biophysical); the values held for wildlife by society (valuational); the regulatory environment (institutional/regulatory); and the needs and demands of society (social-structural) (Kellert 1991; Kellert & Clark 1991). These four systems represent different social, economic and political forces influencing conservation policies and processes. The interactive relationships between them facilitate communication of information and knowledge required by wildlife managers and policy-makers from different stakeholders involved in the conservation processe.

In adapting this framework to suit threatened bird conservation policy, biophysical factors would include the biological and ecological limits on possible wildlife policy knowledge that might enable or constrain threatened species policy-making; valuational factors relate to the worth or importance of threatened birds to society; institutional/regulatory factors refer to all relevant levels of government including legislative, judiciary and executive; and social-structural factors include various power and property relationships that reflect the distribution of rights to use and control resources that affect threatened birds (Kellert & Clark 1991). Broadly speaking, these are socially constructed factors that shape human behaviour towards threatened birds and are reflected in cultural values and norms through people's attitudes, values and behaviours towards them (Klausner 1972).

According to social constructionism, an individual's 'knowledge of everyday life is structured in terms of 'relevances'. Some of these are determined by immediate pragmatic interests and some by their general situation in society' (Berger & Luckmann 2011, p.49). An individual's knowledge is thought to intersect with that of others at many points, as a result of which, they have 'interesting' things to say to each other (Berger & Luckmann 2011).

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Conservation of threatened birds in contemporary society could be identified as knowledge shared by individuals from a particular cross-section of Australian society. However, conservation activities for particular threatened bird taxa tend to be conducted by a small crosssection of experts from certain sectors of society, such as wildlife managers, academics, environmental managers, conservation advocates, landholders and conservation volunteers. Knowledge about different taxa is socially distributed (Berger & Luckmann 2011). Simply put, individuals will have varying degrees of experience and differing types of knowledge about the specific management requirements of a taxon depending on a range of factors including the type of institution they represent or their role in its conservation. Social constructionists might describe this as an 'objectified stock of knowledge common to a collectivity of actors' (Berger & Luckmann 2011, p.77).

Figure 1.2 adapts Kellert and Clark's wildlife policy framework diagram to demonstrate how it might operate in the context of threatened bird conservation policy in Australia. It includes the findings of a preliminary stakeholder analysis. Hence, it provides examples of some of the key stakeholder groups involved in threatened bird conservation in Australia according to their perceived knowledge concerning the biophysical, institutional/regulatory and social-structural factors. Stakeholder involvement is the focus of one of this study's major research questions (Section 1.5) and is the subject of more detailed analysis throughout this thesis. The valuational system includes 12 categories of attitudes from the 'avifaunal²⁷ attitudes typology' which was developed in this study to represent the different kinds of attitudes Australians hold for native birds (Section 3.2).

²⁷ The birds of a particular region, habitat or geological period (Oxford Dictionaries Online 2013h). Birds are a taxonomic class, Aves, from which the terms 'avian' and 'avifauna' derive.



Figure 1.2: Major systems influencing threatened bird conservation policy including examples of key stakeholder groups and attitude categories from the 'avifaunal attitudes typology' developed for this research (adapted with permission from Kellert & Clark 1991).

1.4 Research aims

With little known about the role of values in influencing conservation of threatened species, this research aims to investigate social values held for Australian threatened birds, both by the public and key stakeholders. Given the importance of public opinion in the formation and implementation of environmental policies and processes in Western democracies (Head 2007; Tranter 2012; Tranter & Pakulski 1998), this study endeavours to comprehend community attitudes towards threatened birds. More specifically, the study aims to consider the implications of these values for conservation policy and practice, particularly the values of key stakeholders who are deemed to strongly influence the social construction of conservation processes. This information will increase understanding of how Australians see threatened birds and will provide insights for framing effective conservation policies and plans which appeal at both a policy-maker and public interest level.

1.4.1 Importance of this research

Although much research has been conducted across the world on attitudes towards nature and wildlife, this appears to be the first time that attitudes towards threatened bird species have been studied at a national level. Although the biological aspects of threatening processes have been explored in some cases, it is often social factors which strongly influence recovery success, yet social factors are poorly understood in this context. The comparative social value of different threatened species also appears never to have been explored in the scientific literature despite its likely influence in conservation decision-making. There is little understanding about why some bird species are chosen as 'flagships' or 'icons' and how this may affect their likelihood for long-term survival. Finally, rarity has been linked to increased threat of extinction but it appears that no-one has investigated whether being explicitly identified as rare influences a taxon's likelihood to persist.

1.5 Research questions

The research takes the form of a social science interpretive/phenomenological²⁸ inquiry which assumes that respondents are operating within a particular social context and are therefore influenced by the social constructs that exist within that context. The research aims to understand, interpret and draw insight from human behaviours therefore an inductive research strategy is used to understand 'what is going on'. The research questions are designed to deliver answers that will describe relevant social values and the social situations in which they are held, and to examine the nature of the relationships between these characteristics (Blaikie 2007).

This thesis has three major research questions, within each of which are subsidiary questions:

Q1. How do Australians value threatened birds?

a) which values are held for Australian threatened birds, how do they compare with those held for native birds in general and what can we understand from this?

²⁸ Phenomenology is the science of phenomena as distinct from that of the nature of being (Oxford Dictionaries Online 2013i).

b) how do public values held for threatened birds relate to socio-demographic characteristics?

Q2. Who is involved in threatened bird conservation and how do they communicate their values?

- a) who are the stakeholders, what are their values and whose values count?
- b) what information do stakeholders rely upon?
- c) what messages do stakeholders communicate to the public?

Q3. Do the values held for particular species of threatened birds affect the success of strategies to conserve them?

- a) which values are held for particular species of threatened birds?
- b) which significant characteristics in terms of political decision-making, trigger events and social attitudes lead to a species' status as a key or iconic threatened species?
- c) is the use of flagship threatened birds conducive to educating the public about broader conservation issues and if so which species are most effective?
- d) is the perception of rarity alone sufficient to influence attitudes and behaviour that lead to effective conservation action?
- e) which characteristics of rare birds are important to their conservation?

1.6 Thesis outline

This chapter has introduced the nature of the research problem and situated it within the context of literature relating to social psychology, social constructionism and human dimensions of wildlife research. It has described the social landscape within which threatened bird conservation operates in Australia and identified four major systems influencing wildlife policy relating to threatened bird conservation. Finally, it presented the research aims and questions. Chapter 2 – 'Context of the Research' - contextualises this study by describing relevant theories about the relationships between values, attitudes and behaviours in the context of threatened bird conservation. It then presents a review of major international research on wildlife values and attitudes before narrowing the focus to discuss relevant research conducted in Australia. Chapter 3 – 'A Mixed-methods Approach' - introduces the interactive mixed-methods approach employed to integrate findings from the quantitative surveys and qualitative case studies

conducted. Chapter 4 – 'Public Attitudes towards Threatened Birds' - presents data gathered via three quantitative social surveys conducted with members of the Australian public; it demonstrates how Australians value threatened birds and relates these values to sociodemographic characteristics. The next three chapters, Chapter 5 – 'Yellow Chat Case Study', Chapter 6 – 'Migratory Parrot Case Study' and Chapter 7 – 'White-tailed Black-cockatoo Case Study', examine the social values held for three pairs of Australian threatened birds through a qualitative case study approach. Chapter 8 – 'Synthesis of Findings' - directly answers the research questions by presenting a synthesis of the most important results emerging from Chapters 4 to 7. Chapter 9 – 'Discussion of Findings' discusses main findings from Chapters 1 to 8 in the context of the broader theoretical framework within which this research is situated. Finally, Chapter 10 - 'Research Implications' - explores what key findings might mean for the future of threatened bird conservation in Australia. **CHAPTER 2: Context of the Research**

This chapter contextualises this study by describing relevant theories about the relationships between values, attitudes and behaviours in the context of threatened bird conservation. The international literature on these topics is diverse and complex; much of it derives from the field of human dimensions of wildlife (HDW). Section 2.1 discusses how cultural perceptions and understandings of the world may influence behaviours relating to nature and wildlife through socialisation processes, values, attitudes and norms. Section 2.2 discusses three major approaches adopted to identify and measure values and attitudes towards wildlife which are directly relevant to this study. Finally, Section 2.3 identifies previous HDW studies conducted on wildlife and birds in Australia and critically reviews those which specifically focus on threatened birds.

2.1 World views, values, attitudes and behaviour regarding wildlife

2.1.1 World views and wildlife

Pinpointing the origin of a person's values is a highly complex process. People are born into a cultural setting with its own distinct range of world views. The principal interest here is how this world view shapes values and attitudes towards wildlife and non-human species. Although each individual's interpretation of reality will be unique depending on their culture, society, personal characteristics and life experiences, they will ultimately be influenced by their culture's assumptions about what the world is like. Understanding these assumptions can help explain why individuals act in particular ways in their environments (Aslin & Bennett 2000; Claus, Chan & Satterfield 2010).

The idea of 'nature' may mean different things to different people. There are multiple and contested notions of nature (Soulé 1995; Hampshire *et al.* 2010). While some people believe that wild places can and should exist free from any human interaction, others accept that landscapes across the world have been managed by Indigenous people for thousands of years and that the meaning and significance of places cannot be divorced from human experience and culture (Gammage 2011; McIntyre-Tamwoy 2004). It has been suggested that, because of human alterations to our planet's air through greenhouse gas emissions and acid rain from

industrial processes, nature does not exist any longer and that all places on Earth have become in some sense 'man-made' (McKibben 2006).

Religion may play an important role in shaping an individual's world view. Almost all of the Australians who affiliate with a major world religion (66%) follow one of three Abrahamic²⁹ faiths: Christianity (64%), Islamism (1.7%) or Judaism (0.5%) (Australian Bureau of Statistics [ABS] 2006). Much discussion exists in the literature about the Abrahamic belief that the Earth was created for the benefit of humans rather than non-humans (e.g. Manfredo & Dayer 2004). This is often referred to as an 'anthropocentric'³⁰ world view which embodies an *intellectual* separation of humans from nature and endorses the utilitarian notion that nature is a 'commodity or warehouse of resources' which humans can exploit with impunity (Leiserowitz & Fernandez 2008). This utilitarian view of nature and wildlife is still found particularly within rural communities where economies may be dependent on resource extraction, and residential stability reinforces the sharing of common values and goals (Manfredo, Teel & Bright 2003; Miller 2000).

2.1.1.2 Shifting residency trends

In addition, there are the effects of *physical* separation on the world views of urbanising human populations around the world. This creates concerns among many conservationists who think it may lead to an ideological blindness regarding nature as the foundation upon which civilisation stands (Leiserowitz & Fernandez 2008; Muth & Jamison 2000). City-dwellers who are distanced from the natural environment and wildlife may learn little about what may be considered appropriate behaviour towards other species and may have no customary or traditional responsibilities towards country or wildlife (Aslin & Bennett 2000). Alternatively, increasing urbanisation may lead to the growth of more compassionate, protective and empathetic attitudes towards wildlife (Franklin & White 2001; Kellert 1985b; Mazur *et al.* 2006; Muth & Jamison 2000).

²⁹ Monotheistic faiths emphasising and tracing their common origin to Abraham (Armstrong 1993).

³⁰ Regarding humankind as the central or most important element of existence, especially as opposed to God or animals (Oxford Dictionaries Online 2013j).
In North America, a population-level shift from domination to mutualism value orientations towards wildlife (Section 2.2.2) has occurred as a reflection of changes in the nature of social life due to modernisation (Manfredo, Teel & Henry 2009) which was seen to reduce the association between wildlife as a food source and give rise to the view of wildlife as 'humanlike' (Manfredo, Teel & Henry 2009).

2.1.2 Cultural values theories

Schwartz advanced 'cultural values theories' developed by Hofstede (work values) and Inglehart (materialism-post-materialism³¹) and suggested they can help to explain important social phenomena occurring within a country (Schwartz 2006). Schwartz identified seven cultural value orientations: egalitarianism, harmony, embeddedness, hierarchy, mastery, affective autonomy and intellectual autonomy. He further identified three polar value dimensions that relate to critical issues facing all societies: nature of the relation between the individual and the group (autonomy versus embeddedness); behaviour that preserves the social fabric (egalitarianism versus hierarchy); and how people manage their relations to the natural and social world (mastery versus harmony) (Schwartz 2006).

Figure 2.1 demonstrates key international trends in relation to these seven cultural value orientations, as described by Schwartz based on responses to social surveys conducted in 73 countries. For example, in Australia there appears to be a strong alignment with two major orientations towards affective autonomy and mastery³² which implies that members of Australian present-day society endorse individualism (Schwartz 2006). It might be expected that members of collectivist (embedded) cultures would emphasise sharing of wildlife resources for collective benefit, whereas members of societies endorsing individualism, like Australia's, would

³¹ Post-materialist values arise from the presence of economic and physical security during one's formative years, which is most likely to occur among upper socio-economic strata in western or westernising societies (Inglehart 1977, cited in Schwartz 2006).

³² 'Affective autonomy' encourages individuals to pursue affectively positive experiences for themselves. Important values include pleasure, exciting life, and varied life. 'Mastery' is the polar cultural response to this problem. It encourages active self-assertion to master, direct, and change the natural and social environment to attain group or personal goals. Values such as ambition, success, daring, and competence are especially important in mastery cultures (Schwartz 2006).

emphasise competition over wildlife resources for individual use and gain (Manfredo & Dayer 2004). These value orientations appeal to short-term interests that are contrary to the kinds of characteristics thought to engender nature-protective behaviour (e.g. Clayton & Opotow 2003; Kals, Schumacher & Montada 1999).

Cultural values influence individual and group beliefs and are expressed in a culture's institutional arrangements and policies, norms and everyday practices (Schwartz 2006). An example of this is national politics, where highly contrasting views between conservative and liberal parties regarding social and political issues based on differing internal dispositions can predispose people to different actions (Ajzen 2012a). For example, support for economic liberalism and political conservatism is correlated with anti-environmental views (Milfont 2012). Public opinions may be swayed by political leaders whose influence reaches beyond the sphere of their own supporters; they can provide cues for devotees to follow and simplify the political process for those who might not have sufficient interest to follow political issues for themselves (Tranter 2011).

Context of the research



Figure 2.1: Map of Seven Cultural Orientations as related to key countries around the world (adapted with permission from Schwartz 2006).

2.1.3 Socialisation processes

2.1.3.1 Gender roles

Pro-environmental attitudes and behaviour are often linked to gender roles and socialisation processes, whereby individuals are moulded by gender expectations within the context of cultural norms (Zelezny, Chua & Aldrich 2000). Across many modern westernised cultures, female socialisation tends to engender in women a nurturing and compassionate disposition, tendencies towards interdependence and cooperation, and a moral emphasis on caring for intimate associates (Kellert & Berry 1987; Zelezny, Chua & Aldrich 2000). In contrast, male socialisation processes may tend to emphasise work, competition and assertiveness (Kellert & Berry 1987; Zelezny, Chua & Aldrich 2000) and engender a more rational disposition, meaning that men may be more likely than women to hold more 'cognitive and logically abstract' perceptions of animals (Kellert & Berry 1987). For example, men may have greater factual knowledge about animals and ecological concern for relationships of wildlife to natural habitats, may derive more satisfaction over control of animals, and may have greater interest in the practical and recreational use of wildlife than do women (Herzog 2007; Kellert & Berry 1987; Miller 2000).

Zelezny and colleagues' (2000) review of studies conducted between 1988 and 1998, found that women reported significantly stronger environmental concerns than men and that gender socialisation, linked to values, can explain these differences (Zelezny, Chua & Aldrich 2000). Kellert and Berry (1987) found that women tend to value animals for fundamentally different reasons than do men (Kellert & Berry 1987). In Australia, gender was the most consistent predictor of levels of environmental concern; higher concern among women than men mirrored their over-representation among the environmental, peace and anti-nuclear movements (Tranter 1999). Similarly, in New Zealand, individuals with pro-environmental attitudes were older, female and members of an environmental organisation (Milfont 2012).

2.1.3.2 Age

The relationship between age and wildlife attitudes is complex. Some studies indicate that younger adults tend to express more interest, affection and concern for animals than other age groups, especially the elderly (Kellert 1993; Miller 2000) while concern for the ethical treatment

of animals and ecological protection of wildlife was strongest mostly among those aged up to 35 years in the USA (Kellert 1993). Miller's 2000 study found that all age groups expressed a strong humanistic value for wildlife but that those in the youngest and oldest groups were least likely to be interested in learning about and interacting with wildlife. Both Miller (2000) and Blaikie (1992) found that middle aged Australians showed strongest commitment to an ecological world view. This may be due to 'cohort' influences where, for example, the youth of a certain era engaged in a social movement because of the attention certain issues were given at the time, and this tended to reinforce their attitudes about those issues which have subsequently remained fairly consistent throughout their lives (Blaikie 1992).

2.1.3.3 Education

In the USA and Germany, college-educated students expressed much greater appreciation, interest and concern for animals and nature than other education groups, especially those educated only to grade-school level (Kellert 1993). In Australia, those holding a bachelors degree or higher were about twice as likely to support green issues as the non-tertiary educated (Tranter & Pakulski 1998). In Victoria, curiosity was higher amongst the more highly educated whereas utilitarian, negative and aesthetic values were expressed less by those with a higher education (Miller 2000). Franklin's Australia-wide study found that the most highly educated tended to take a pro-native animal position compared with the less-well educated (Franklin 2007a).

2.1.3.4 Identity

The level of knowledge people have about wildlife may be due to the extent of wildlife experiences they have had. Wildlife is often experienced from a comfortable distance, i.e. vicariously on television, confined within a zoo enclosure, or in well-managed parks and reserves. Attitudes influenced by direct experiences are thought to come more readily to mind than attitudes based on second-hand information (Berger & Mitchell 1989, Fazio *et al.* 1982, cited in Ajzen 2012a). Strong, highly accessible attitudes are likely to be relatively stable and resistant to change and thus are good predictors of later behaviour (Ajzen 2012a). Television programs about and zoo experiences of animals are poor substitutes for spontaneous

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experiences of wildlife in its natural habitat: 'Wild lives raise the excitement level; the untrammelled quality of their lives raises the quality of human life' (Rolston 1987, p.189).

Providing positive experiences with nature on a regular basis can establish children's emotional affinity towards specific aspects of nature and their environmental identity, particularly if they take place in the presence of significant others (Clayton & Opotow 2003; Palmer *et al.* 1999). Emotional affinity towards nature can be traced back to present and past experiences in natural environments and can explain nature-protective behaviour. Further, an emotional affinity towards nature becomes stronger the more concrete and specific nature contacts are, therefore environmental educational programs are of most help if they are conducted with significant others (Kals, Schumacher & Montada 1999).

2.1.4 Individual and group values

A value implies a code or standard which has some persistence through time or which organises a system of action; values are not just a simple preference (see 'assigned values' below) but a preference considered to be justified either morally, by reasoning or by aesthetic judgement (Kluckhohn 1962). If values were completely stable, then individual and social change would be impossible, but if values were completely unstable, continuity of human personality and society would be impossible (Rokeach 1973). It is thought values are initially taught and learned in isolation from other values in an absolute manner, i.e. individuals are not taught to be 'a little bit' honest, or that sometimes it is acceptable to be honest and other times it is not. It is this process that makes values enduring (Rokeach 1973). Gradually, individuals learn to integrate several isolated values into an organised hierarchical system where each value is ordered in priority or importance relative to other values (Rokeach 1973). There are a limited number of values because they are the cognitive representation of basic life needs and relate only to the limited number of fundamental social and biological needs of humans (Rokeach 1973). Values are no more observable than culture and tend to be expressed in the form of attitudes and behaviours (Fulton, Manfredo & Lipscomb 1996; Kluckhohn 1962).

2.1.5 Held and assigned values

In modern English the term 'value' can be used as a noun or a verb, and can mean different things. The two most relevant definitions for this research are: held values (noun) and assigned values (noun). Held values are principles or standards of behaviour, or one's judgement of what is important in life. Assigned value (noun) is the regard that something is held to deserve; the importance, worth, or usefulness of something (Oxford Dictionaries Online 2012).

Held values are abstract ideals, such as freedom, equality and sustainability (Leiserowitz 2006). Held values tend to be associated with ideas, behaviours and experiences and are held by an individual about something (Brown & Manfredo 1987). Held values include values dealing with modes of conduct, end states or desirable qualities (Brown 1984; Leiserowitz 2006). They define goals, frame attitudes and provide standards against which the behaviour of individuals and societies can be judged (Leiserowitz 2006; Manfredo 2008). Held values enable interpretation of events and information and are consistent across situations and events (Manfredo 2008; Manfredo, Teel & Bright 2003).

Assigned values are dependent on a person's held values and their preference relationship with an object, experience or activity. Assigned values can be viewed as the relative importance or worth of something and can be expressed by actions or words, for example the perceived worth of a wildlife experience as a cost, time commitment, or importance to an individual (Brown 1984). To illustrate, natural resource economists might use willingness-to-pay methods to determine the financial value of a particular wildlife species. Assigned values tend to be associated with goods, services and opportunities (Brown & Manfredo 1987). Assigned values are assumed to influence decisions, particularly new ones, and help people make choices especially those involving trade-offs among preferences (Dietz, Fitzgerald & Shwom 2005; Leiserowitz 2006).

2.1.6 Value orientations

Three major classes of patterns are thought to occur within a culture: systems of ideas or beliefs; systems of expressed symbols; and systems of value orientations. The term 'value orientation' suggests a normative influence on behaviour and is equally applicable to individuals and to groups (Kluckhohn 1962). The study of value orientations is considered '...an area where

investigations of thematic principles in personalities and in cultures may usefully come together' (Kluckhohn 1962, p.411). See Section 2.2.2 for a discussion of value orientations relating to wildlife management research.

2.1.7 Attitudes

Individual differences in value expression can be accounted for by examining the basic beliefs associated with values (Fulton, Manfredo & Lipscomb 1996). For example, two individuals may hold the same value for wildlife (e.g. respect for life) but differ greatly in their beliefs about humane treatment of animals (Schultz & Zelezny 1999). An attitude can be defined as 'a latent disposition or tendency to respond with some degree of favorableness or unfavorableness to a psychological object' (Ajzen 2012a, p.368). It can also be described as a positive or negative evaluation of something quite specific which often derives from and reflects abstract values (Dietz, Fitzgerald & Shwom 2005; Leiserowitz 2006). Attitudes towards an object are acquired automatically, as people form beliefs about the object, and are influenced by the strength of these beliefs. People can form many different beliefs about an object but only a few beliefs may be mobilised in a given situation. These readily accessible beliefs are considered to be the prevailing determinants of a person's attitude (Ajzen 2012a).

Attitudes are more readily examined than values partly because of our own self-awareness of the evaluations we make, but also because they can be created spontaneously and mobilised in situations when they are needed (Manfredo 2008). To some extent we express our attitudes daily in our behaviour and our attitudes help to explain our behaviours and the purpose of those behaviours to others (Manfredo 2008). Attitudes are less stable in nature than values and therefore may be more easily influenced by communication strategies and other interventions (Teel & Manfredo 2009) if these interventions remain consistent with underlying values. Many researchers believe that knowledge about attitudes can be useful in predicting behaviour and designing interventions to change behaviour (Manfredo 2008).

2.1.8 Norms

Norms are statements about how one ought to behave (Dietz, Fitzgerald & Shwom 2005). Norms are important because they help explain the power of the social group over the actions

of individuals (Manfredo 2008). The behaviour of significant others such as family and friends can influence individuals particularly when taken as norms describing how one should behave (Dietz, Fitzgerald & Shwom 2005; Manfredo, Teel & Bright 2003). Norms, along with networks and trust, can facilitate co-operation and contribute to social cohesion within a community (Maller 2008). However, individuals within a group may differ in their observance of and compliance with the group's norms, partly due to the nature or extent of their personal identification with the group and the strength of their values or conflicts with other beliefs or groups (Manfredo 2008).

2.1.9 Intentions

Although it is generally assumed that intentions and behaviour will reasonably follow a decision, knowledge of a person's attitude or beliefs alone is not sufficient to predict their likely behaviour (Wicker 1969; cited in Ajzen 2012a; Dietz, Fitzgerald & Shwom 2005). Even the best intention to carry out a certain action may be thwarted by any number of factors and many studies have shown that behavioural intentions account for a considerable proportion of variance in behaviour (Ajzen 2012a; Brown 1984; Corral-Verdugo 1997; McKenzie-Mohr 2000). It is difficult to associate stated intentions with actual behaviours and actions. Dietz and colleagues (2005) conducted a review of social scientific research on values, specifically relating to treatment of the biophysical environment and found that the link between self-reported behaviours or behavioural intentions and actual behaviour is far from perfect (Dietz, Fitzgerald & Shwom 2005). This is probably due to: 'the rich mixture of cultural practices, social interactions, and human feelings that influence the behavior of individuals, social groups and institutions' (Stern & Aronson 1984; cited in McKenzie-Mohr 2000, p.545).

2.1.10 Barriers to intended action

An individual's intention to perform a particular behaviour may be limited on many levels from institutional (cultural, political and economic) to personal. Institutional factors can act as barriers that prevent individuals from acting in accordance with their values and attitudes e.g. through laws, regulations, subsidies, infrastructure, the constraints of available technology, social norms and expectations, and the broader social, economic and political context (Claus,

Chan & Satterfield 2010; Leiserowitz 2006; Leiserowitz & Fernandez 2008). On a personal level, behavioural options can also be limited by education, knowledge, skill, or lack of adequate personal control, such as insufficient willpower and perseverance or failure to obtain cooperation from another person (Dietz, Fitzgerald & Shwom 2005; Leiserowitz 2006). Modern humans live in a world of limited resources, including time, energy, money, and attention, where individuals are forced to choose, consciously or unconsciously, between competing values (Dietz, Fitzgerald & Shwom 2005; Leiserowitz 2006). Indeed, 'most debates over social policies, decisions, and actions are fundamentally disagreements over the relevance and priority of particular values' (Leiserowitz, Kates & Parris 2006, p.440).

2.1.11 Behaviour

When one value is activated along with others in a given situation, the behavioural outcome will be a result of the relative importance of all the competing values a situation has activated (Rokeach 1973). This seems to suggest that behaviour may be somewhat automatic but, according to Fishbein and Ajzen's theory of planned behaviour (Ajzen 2012b, p.18):

'...human action is guided by three kinds of considerations: beliefs about the likely outcomes of the behaviour and the evaluations of these outcomes (behavioural beliefs); beliefs about the normative expectations and actions of important peers and motivation to comply with these peers (normative beliefs); and beliefs about the presence of factors that may facilitate or impede performance of the behaviour and the perceived power of these factors (control beliefs).'

Predicting behaviour on the basis of knowledge about values and attitudes is typically very difficult because a range of factors may intervene between values, attitudes and behaviours; further, broad personality traits and socio-demographic characteristics are deemed poor predictors of individual behaviours (Ajzen 2012a). Although general attitudes can predict *general* behaviours, they are not typically reliable for predicting any *particular* action (Ajzen 2012a). Attitudes based on direct experience tend to be better predictors of behaviour than attitudes based on second-hand information and behaviour is considered more likely to be

consistent with an attitude if the two are compatible in terms of target, action, time and context (Ajzen 2012a).

2.1.12 Cognitive dissonance

A person does not hold an opinion, belief, value or attitude unless they think it is correct. However, it is not uncommon for an individual to simultaneously hold contradictory beliefs (Festinger 1962). A person may cling to their existing beliefs and world views even when they suspect information they have previously relied upon to be false, using a variety of cognitive and motivational processes (e.g. cognitive dissonance³³ or motivated reasoning³⁴). Their decisions to adhere to their existing beliefs may be based on invalid or selective information, be self-serving, or otherwise fail to correspond to reality to defend their beliefs and attempt to protect their feelings of identity and self-worth (Ajzen 2012b; Ecker & Cook 2012; Green 2012).

2.1.13 Cognitive, affective and evaluative factors

Human behaviour can be understood to some extent by the idea of an internal disposition. Psychologists believe that internal dispositions are made up of a multitude of constructs including belief, disposition, evaluation, expectancy, goal, habit, intention, knowledge, motive, opinion, personality trait, prejudice, schema, stereotype, value and attitude, and these can be categorised by three labels: cognitive, evaluative and behavioural (Ajzen 2012a). This can be slightly confusing because, according to Rokeach, values are beliefs and therefore have cognitive, affective and behavioural components (Rokeach 1973):

'A value is a cognition about the desirable... a value is affective in the sense that (a person) can feel emotional about it, be affectively for or against it... a value has a behavioural component in the sense that it is an intervening variable that leads to action when activated' (Rokeach 1973, p.7).

Meanwhile, according to Kellert (1983), human attitudes towards wildlife can be thought of as also comprising cognitive, affective and evaluative components. The cognitive aspect

 ³³ '...a negative drive state which occurs whenever an individual simultaneously holds two cognitions (ideas, beliefs, opinions) which are psychologically inconsistent' (Aronson 1969, p.2).
³⁴ Involves strategies such as denial and counter-arguing (Ecker & Cook 2012).

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underlies rationality and refers to knowledge and factual understanding of animals (Kellert 1983). Kellert identified three types of cognition regarding wildlife: 'factual knowledge' (e.g. the iguana is not a mammal); basic principles or relationships between animals (e.g. knowledge about population dynamics); and awareness of conservation issues and problems, and management principles and practices (e.g. knowledge of conservation policies and processes).

The affective component refers primarily to feelings and emotions that people attach to animals (Kellert 1983). Emotions are understood to be biologically influenced processes laid down by a long evolutionary history and 'primary' or 'universal' emotions include: happiness, sadness, fear, anger, surprise, or disgust (Damasio 2008). Feelings are thoughts associated with emotions that have just occurred (Damasio 2008). Emotions are part of affect and emotional responses are sometimes considered to be at the heart of human attraction to, and conflict over, wildlife (Manfredo 2008). Emotions may play a critical role in decision-making and may be an important component of intelligence (Cacioppo & Gardner 1999, cited in Manfredo 2008).

'Emotions have some kind of regulatory role to play, leading in one way or another to the creation of circumstances advantageous to the organism exhibiting the phenomenon . . . their role is to assist the organism in maintaining life' (Damasio 2008, p.51).

The evaluative aspect refers to judgements and values associated with animals (Ajzen 2012a; Kellert 1983). Some of our attitudes towards animals may be influenced by biological or genetic dispositions. The notion that our cognitive evaluations of animals and their treatment is superimposed on more primitive affective responses (e.g. fear of snakes) that are adaptive through evolutionary time has implications for any alteration of our behaviour and attitudes towards animals (Herzog 1988; Wilson & Kellert 1993). Nevertheless, it is likely that cognitions and cultural learning override or re-channel emotional responses in most cases (Manfredo 2008).

2.1.14 Framing

Framing is a key aspect of the social construction of wildlife (Hytten & Burns 2007; Section 1.3.3). Humans think in terms of typically unconscious structures called 'frames' which include semantic roles, relations between roles and relations to other frames (Lakoff 2010). For

example, a threatened bird 'frame' may include assumptions about certain roles and relations that people have with the bird, such as conservation biologist, landholder, birding ENGO and recovery team. Since all of our knowledge is thought to use frames and all thinking and talking involves framing, a single word may typically activate not only its defining frame but also much of the system its defining frame is situated within (Lakoff 2010). Examples include specialised usage of terms such as 'rare', 'pest', 'species' and 'flagship' which may convey specific concepts to a conservation biologist but mean something completely different when used in everyday language or in other specialised contexts (Section 1.3.3).

'Since language that is repeated very often becomes "normally used" language, ideological language repeated often enough can become "normal language" but still activate that ideology unconsciously in the brains of citizens and journalists. In short, one cannot avoid framing. The only question is, whose frames are being activated – and hence strengthened – in the brains of the public?' (Lakoff 2010, p.72).

The problem of framing in terms of specialised language goes beyond the conservation of individual threatened taxa: environmental messages that hinge on difficult to understand concepts, such as 'climate change', are far less likely to influence the public than those that centre on more readily comprehensible constructs such as 'pollution' (Hannigan 2006), possibly because broad problems such as climate change have less direct effect on individuals so people may be less willing to take action to resolve them (Schultz & Zelezny 2003). Further, the news media has shown a tendency to frame environmental issues mostly in terms of natural science or politics which contributes to 'sectoralisation' of the environment from other social issues (Leiserowitz & Fernandez 2008). Attitudes towards such concepts are likely to be influenced by pre-existing mental constructs used to understand them and from which people draw conclusions about them (Selge & Fischer 2011).

2.2 Review of research on wildlife values and attitudes

Now that the major social concepts relevant to this research have been presented, the discussion can turn to ways in which such concepts have been studied in the context of wildlife management and conservation.

Over the last 40 years or so, researchers have increasingly been applying the social sciences to wildlife management and conservation through empirical, social-psychological approaches to measuring attitudes and values for wildlife in general (Manfredo 2008). Three major approaches to identifying and measuring values and attitudes towards wildlife are directly relevant to this study:

- The 'attitudes towards animals typology' approach developed principally by Kellert (e.g. Kellert 1976, 1980, 1985a, 1991; Kellert & Clark 1991) and advanced further by Campbell and Smith (2006);
- The 'wildlife value orientations' (WVO) approach developed by Manfredo and colleagues (e.g. Fulton, Manfredo & Lipscomb 1996; Manfredo & Dayer 2004; Manfredo, Teel & Bright 2003; Manfredo, Teel & Henry 2009; Teel & Manfredo 2009);
- The 'human-animal relations' approach advanced by Franklin (e.g. Franklin 2007a, b; Franklin & White 2001).

This study applies the first approach by extracting the most appropriate attitude categories from both Kellert's and Campbell and Smith's typologies to create a new typology specifically for measuring attitudes towards birds (Section 3.2). The second and third approaches are also directly relevant to the findings of this research therefore all three are explored further below.

2.2.1 'Attitudes towards animals'

In 1974, Kellert developed a typology of nine attitudes towards animals (Kellert 1974, cited in Kellert 1980). This typology was further developed in the next few years, over the course of several quantitative studies. It was based on attitude scales used to assess the relative distribution of the various attitude types among the general public and diverse sociodemographic and animal activity groups in the American population and internationally (e.g. Kellert 1976, 1979, 1980, 1985a, 1989, 1991, 1993, 1995; Kellert & Clark 1991). Kellert developed over 60 attitude questions on which to base his scales (e.g. Kellert 1979, 1980) which he admits were crude approximations of the attitude types and could only very broadly measure the true prevalence and distribution of different attitudes in the American population (Kellert 1980). He believed that the expression of wildlife values and attitudes depends to some extent on people's circumstances and the particular wildlife in question. Some wildlife attitudes are likely to be more strongly underpinned by values than others and this may depend on the context and the knowledge a person holds about a particular animal. Kellert concluded that most individuals demonstrate predominant characteristics of one primary attitude, with elements of secondary and tertiary attitudes also present (Kellert 1976). For the main definitions of Kellert's attitude categories, see Table 2.1.

Although subsequent research demonstrates that attitudes towards wildlife in modern society have changed since Kellert's pioneering work (e.g. Czech, Krausman & Borkhataria 1998; Manfredo, Teel & Bright 2003), Kellert's methods show the relevance of attitudinal research to wildlife decision-making and describe the various ways people consider wildlife, including how opposing values or attitudes can lead to conflict. Kellert's 1980 study identified that the most common attitudes towards animals in American society by a large margin were humanistic, moralistic, utilitarian and negativistic. He concluded that these four attitudes could be grouped into 'two broad and conflicting dimensional perceptions of animals' and that the relative popularity of these four attitudes in American society may suggest a 'dynamic basis for the conflict and misunderstanding existing today concerning various issues involving people and animals' (Kellert 1980, pp.35-6). Table 2.1: Comparison of wildlife values typologies (extracted from Campbell & Smith 2006; Kellert 1976, 1985; Kellert & Clark 1991). (N/A indicates the attitude was not included in the typology).

Attitude	Kellert 1976, 1985; Kellert & Clark 1991	Campbell & Smith 2006
Aesthetic	Interest in beauty, symbolic properties of animals, enjoyment of animals as objects of beauty (paintings, sculptures, movies), symbolic significance (poetry, children's stories, cartoons). Primary interest in physical attractiveness, symbolic characteristic of animals	Turtles as cute, beautiful, amazing, graceful
Conservation	N/A	Increases/decreases in sea turtle populations, turtles as endangered species, threat of extinction, loss of habitat/nesting ground, contributing to conservation. Something is valued for its conservation status
Cultural	Cultural, symbolic and historic: animals, plants function as expressions of group identity, social experiences, objects of specialised attachments	N/A
Ecological	Primary concern for environment as a system, for interrelationships between wildlife species, natural habitats	N/A
Existence	It is possible to believe all species have inherent rights and spiritual importance; right to survival; human duty to protect and preserve species; value of knowing a rare species exists without seeing it	Never seen turtles; never had direct experience with them
Humanistic	Primary interest, strong affection for, individual animals such as pets or large wild animals with strong anthropomorphic associations	Emotional attachments to turtles (e.g. loving turtles); 'emoting' with turtles while interacting with them; childhood memories of turtles
Intrinsic	N/A	Turtles having distinct qualities separate from their relation to humans (e.g. they have feelings, purpose)
Mastery	Animals provide opportunity for dominance, control; expressions of prowess, skill in competition typically emphasised. Primary interest in mastery, control of animals, typically in sporting situations	N/A

Context of the research

Attitude	Kellert 1976, 1985; Kellert & Clark 1991	Campbell & Smith 2006
Moralistic	Great concern for welfare of wild, domesticated animals. Typically more	N/A
	philosophical than affectionate, based on ethical principles opposing	
	exploitation and infliction of any harm, suffering or death on animals.	
	Tendency to perceive kinship, sense of equality between humans and	
	animals. Primary concern for right and wrong treatment of animals, with	
	strong ethical opposition to presumed overexploitation or cruelty	
	towards animals	
Naturalistic	Primary satisfaction is direct personal contact with wilderness. Wildlife is	Experiential: specific exciting or moving experiences with turtles on the
	valued for opportunities provided for activity in the natural environment.	beach, detailed description of interactions with turtles
	There is enjoyment to be gained from direct contact with wildlife while	
	taking part in outdoor activities e.g. camping and the opportunity to	
	observe rare species	
Negativistic	Desire to avoid animals. Feelings such as indifference, dislike, fear and	N/A
	superstition. Marked by fundamental alienation from the natural world.	
	People-centred with little empathy or kinship with animals and non-	
	human world. Primary orientation an active avoidance of animals due to	
	dislike or fear.	
Scientific	All species have actual or potential value for enhancing human	Sea turtle migrations, reproductive habits, nesting habits, use of habitat,
	knowledge and understanding of the natural world. Primary interest in	life history, turtles - ecological roles, doing science (collecting data,
	the physical attributes and biological functioning of animals	tagging)
Theistic	Primary orientation a fatalistic belief in wildlife as controlled by external	Spiritual connection to turtles, or expressions of humans' role as
	deities or natural forces	stewards of nature, links between nature and God
Utilitarian	Utilitarian-consumption: primary concern in the practical value of	N/A
	animals. Utilitarian-habitat: primary interest in the practical value of	,
	habitat associated with wild animals	

Kellert's methods attracted some criticism. There is little evidence to assess the validity and reliability of his attitudinal scales (Franklin & White 2001; Kaltenborn et al. 2006; Vitterso 1999, cited in Manfredo 2008). At the time he developed his scales, Kellert suggested the importance of understanding the role of emotions and value judgements about wildlife (Kellert 1983), however his model did not propose any relationship between the concepts used to describe the scales, or between attitudes and other concepts (Manfredo 2008). Kellert's own orientation transitioned from a social-psychological to a socio-biological orientation when his interests turned to the concept of 'biophilia'³⁵ (Kellert & Wilson 1993). He kept his attitude descriptions unchanged but provided no empirical evidence to support this conceptual shift (Manfredo 2008). Further, Kellert referred to the psychological concepts being measured by his attitude scales in different ways such as values, attitudes, perceptions, evaluations and inherited tendencies, resulting in a lack of a clear conceptual foundation (e.g. such as whether they were related to stages in moral development, and whether there were links between attitudinal theory and value theory and biophilia). This has drawn criticism (e.g. Manfredo 2008) because a lack of a consistent conceptual framework resulted in contradictory inferences being possible. For example, attitude theory suggests that 'attitudes' can change over time, whereas value theory suggests that 'values' tend to be consistent throughout a person's lifetime (Manfredo 2008). Hence, it was unclear whether attitudes or values or something else were being measured.

2.2.1.1 Exploring 'attitudes towards animals' in depth

Campbell and Smith (2006) applied Kellert's typology (Kellert 1986) to examine the values of volunteers working for an endangered sea turtle conservation program in Costa Rica. They used a qualitative approach due to the small number of available interviewees, and their interest in exploring how different values interact, compete and reinforce one another. Participants were asked about conservation activities they had recently completed so they could easily discuss events and associated feelings in detail and were encouraged to use everyday language and emotions to discuss their beliefs, experiences and values in a natural and familiar way

³⁵ The innately emotional affiliation of humans to other living organisms (Wilson 1993).

(Satterfield 2001). The authors considered this approach offered a better articulated and more profound interpretation of human relationships with, and values for, nature compared with a quantitative attitudinal survey method (Campbell & Smith 2006). Campbell and Smith developed categories for eight kinds of attitudes that the volunteers were deemed to hold in respect of sea turtles (Table 2.1).

This study has some methodological limitations with regard to its relevance to this research, however. Interviews were conducted within a conservation context with a small number of conservation tourists representing North and South/Central American countries and findings therefore reflect the values and attitudes of a very specific subset of the American population rather than of the broader public. Further, the research focused on attitudes towards one sea turtle species and cannot necessarily be generalised to other sea turtle species or to wildlife more broadly.

2.2.2 'Wildlife value orientations'

'Human dimensions of wildlife' (HDW) research (Section 1.3.4) is associated with the growth in the wildlife management profession (Manfredo 2008; Manfredo, Teel & Henry 2009; Vaske & Manfredo 2006). This field has increased understanding about wildlife attitudes which can be applied to develop wildlife management priorities and make wildlife management decisions that are at least partly informed by the values and attitudes of society (Manfredo 2008).

The 'wildlife value orientations' (WVO) approach was developed in 1996 by Fulton and others as a basis for examining links between changes in behaviour and societal preferences (e.g. declines in hunting in the USA) with long-term changes in WVOs. It is based on a cognitive hierarchy structure whereby values, basic beliefs, attitudes, norms, behavioural intentions and behaviours are theorised to build upon one another (Fulton, Manfredo & Lipscomb 1996). WVOs are 'defined by the pattern of direction and intensity among a set of basic beliefs... which provide consistency and organisation among the broad spectrum of beliefs, attitudes and behaviours regarding wildlife' (Fulton, Manfredo & Lipscomb 1996, p.28). The original study using this approach demonstrated the existence of two distinct WVOs: the first being 'consumptive' in orientation and the second 'appreciative' and found that WVOs may directly

influence (but not predict) specific wildlife-related behaviours (Fulton, Manfredo & Lipscomb 1996).

More recently an examination of perceived changes in WVOs in the USA over the latter half of the 20th century demonstrated that value and value orientation shift has occurred possibly as a result of urbanisation, increasing affluence and education, and declining residential stability (Manfredo, Teel & Bright 2003). This shift demonstrates a swing away from traditional materialist values (focused on physical security and economic well-being) towards postmaterialist values (focused on quality of life, self-expression and self-esteem). The findings suggest a link between the widespread conflict in contemporary wildlife issues and possible causes within society, and suggest that conservation success is necessarily linked to understanding broader cultural conditions (Manfredo, Teel & Bright 2003).

In a study to understand the diversity of public interests in wildlife conservation in contemporary North America, Teel and Manfredo (2009) identified a four-group-typology classified on two primary value orientations towards wildlife which were indicative of broad, cultural ideologies and which could lead to social conflict regarding certain wildlife issues (Teel & Manfredo 2009). The two primary value orientations were: domination (view of wildlife that prioritises human well-being over wildlife and treats wildlife in utilitarian terms); and mutualism (view of wildlife as capable of relationships of trust with humans and defined by a desire for companionship with wildlife). It is suggested there is more potential for social conflict on wildlife issues in areas with a greater mix of opposing value orientations (e.g. 50% traditionalists and 50% mutualists) compared with more homogeneous areas (Teel & Manfredo 2009).

2.2.3 'Human-animal relations'

The 'human-animal relations' or, in the USA, 'human-animal studies' (HAS) field of research is formally advanced by the Animals and Society Institute (ASI) (Animals and Society Institute [ASI] 2012). It is defined by its subject matter rather than any methodological approach, being '...primarily devoted to examining, understanding, and critically evaluating the complex and multidimensional relationships between human and other animals' (Shapiro 2008, p.5). The field is associated more with European scholarly practices and merges anthropology, geography,

psychology, sociology and other social sciences to convey a cross-cultural, multi-disciplinary interest in understanding human-wildlife relationships (Franklin 1999; Manfredo 2008).

Franklin's research in the field of human-animal relations in Australia takes a sociological approach³⁶ which encompasses global variations in human relations with the natural world including cultural, religious and mythic dimensions, with a strong focus on historical changes and modernisation processes (University of Tasmania [UTAS] 2012).

Several of Franklin's publications in this field are relevant to this thesis particularly due to their exploration of the cultural and historical trends which define Australia's post-colonial relationship with the natural world (e.g. Franklin 1996, 1999, 2006, 2008), with animals in general (Franklin 2007a; Franklin & White 2001) and birds in particular (Franklin 2007b).

The most relevant study is Franklin's nationally representative survey on human-non-human animal relationships in Australia (Franklin 2007a). It is uniquely comprehensive, providing both a snapshot of the relationships between Australians and non-human animals and their views on critical issues such as: ethics, rights, animals as food, risk from animals, native versus introduced animals, hunting, fishing and companionate relations with animals (Franklin 2007a). Franklin identified that trends in Australians' relationships with non-human animals are consistent with trends observed in other Western societies, particularly regarding the emotional bonds between humans and companion animals including birds, but also in their positive relations with wildlife around the home and beyond. Franklin also highlights that Australia's post-colonial attitudes towards native and introduced species result in a distinct bio-political tension (e.g. between those concerned with animal rights and those concerned with management of introduced species) (Franklin 2007a), which is evident in the values-based conservation policies adopted.

³⁶ A tradition exercised more commonly in the United Kingdom than elsewhere.

2.3 Attitudes towards wildlife, including birds, in Australia

2.3.1 Attitudes towards Australian wildlife

Research on the human dimensions of wildlife in Australia is relatively recent, and early perceptions about the role of HDW research among Australian wildlife managers were quite negative (Miller 2009). Initial HDW research priorities focussed significantly on vertebrate pest management but social researchers have increasingly advocated the integration of social science research into management practices (e.g. Brooks 2012; Maller 2008; Mazur *et al.* 2006) and the field has expanded rapidly in the last 10 to 20 years to cover a range of themes (Miller 2009). Figure 2.2 shows a selection of these studies grouped loosely by research topic.

A review of five key studies on attitudes towards wildlife (Aslin 1996; Fitzgibbon & Jones 2006; Franklin 2007a; Franklin & White 2001; Miller 2000) suggests the existence of non-consumptive and consumptive/utilitarian values among Australians.

Regarding non-consumptive values, an Australia-wide study of people representing specialised interests in wildlife found that overall, by far the most important values and attitudes expressed were those that were based on seeing, appreciating or knowing about wildlife living freely in natural or semi-natural ecosystems (Aslin 1996). In Tasmania, a content analysis of animal-related newspaper stories published over a 50 year period in The Mercury identified a decline in anthropocentrism and a rise in 'zoocentrism' (the recognition of animals as full or partial moral subjects) and in 'sentimentalisation' (an enhanced emotional content and thoughtfulness in human relationships with animals) (Franklin & White 2001). In Victoria, a study of public attitudes towards wildlife demonstrated that attitudes were strongly based around an emotional attachment to individual animals and an interest in learning about wildlife and the natural environment. This relatively strong expression of the humanistic value was supported by the public's interest in pet animals while the curiosity/learning/interacting value was supported by their interest in animals in the wild (Miller 2000, 2003). In Brisbane, urban residents were 'pleased to be living amongst native animals' and birds were the most frequently identified type of wildlife encountered near participants' homes (Fitzgibbon & Jones 2006). An Australia-wide study of public attitudes towards animals found strong moral support for animals (e.g. regarding factory farming, moral rights for animals, hunting native animals and mistreatment of animals) and enjoyment in engaging with wildlife (e.g. watching wildlife programs on television) (Franklin 2007a).

Regarding consumptive/utilitarian values, Aslin's study identified several examples of people distancing themselves from wildlife, in particular those who were either directly or indirectly involved in killing wildlife and those who objectified or commodified wildlife; this sometimes included negative or ambivalent attitudes towards a particular species, as in the case of an Emu farmer who both 'hated' and admired his emus. Miller's study described how utilitarian-habitat and dominionistic/wildlife-consumption values, although less prevalent than humanistic or curiosity/learning/interacting values, were held most strongly by those living in rural locations, while attitudes supporting harvesting of kangaroos for consumption and attitudes supporting logging of forests tended to be strongest in rural locations where residents rely on such activities for income or jobs (Miller 2000). Franklin's study also found that many Australians would put the needs of humans before those of animals when it comes to issues such as medical testing, eating meat, and recreational fishing and hunting, and that up to two thirds of Australians were anxious about a range of animal-related risks such as attacks, disease or stings and bites (Franklin 2007a).



Figure 2.2: Selection of Australian studies focusing on the human dimensions of wildlife. Studies are grouped loosely by theme.

2.3.2 Attitudes towards Australian threatened birds

In addition to Australian HDW studies on attitudes towards wildlife in general, around half as many again have been conducted specifically on birds (Table 2.2). This indicates that birds are of particular interest to some HDW researchers and the range of topics studied highlights some of the more common relationships people have with birds in the wild and around the home. All of the studies tended to focus on single issues in isolation, rather than attempting to explore the broader social landscape within which people and birds tend to interact (Section 1.2). Around half of the bird-related HDW studies (Table 2.2) featured threatened birds and their research focus seems to reflect the interests of a small number of researchers and the bias of urbanisation in Australia towards coastal areas. Methods applied in these studies tend to follow the empirical social-psychological survey approach, typically employing use of a quantitative survey instrument or participant observation techniques.

Some studies primarily considered the conservation of threatened birds in general but most explored attitudes towards the conservation of individual threatened bird species or families of species, and in this respect there was a research bias towards the Orange-bellied Parrot (OBP) *Neophema chrysogaster* (e.g. Maguire, Rimmer & Weston 2013; Weston *et al.* 2012; Wolcott *et al.* 2008) and shorebirds or wetland birds (e.g. Antos, Weston & Priest 2006; Weston, Antos & Glover 2009; Williams *et al.* 2009). In terms of survey respondents, around half of the studies explored the attitudes of those directly involved in bird-related activities, such as volunteers, ornithologists and conservation experts (e.g. Johnstone 2011; Miller & Weston 2009; Weston *et al.* 2006; Wolcott *et al.* 2008) while the other half explored public attitudes and behaviour in the context of specific conservation management strategies (e.g. Antos, Weston & Priest 2006; Weston, Antos & Glover 2009; Weston *et al.* 2009). Most studies explored the attitudes of a single stakeholder type within a study, precluding any comparison of attitudes across different stakeholder groups; no studies employed an in-depth qualitative approach and none investigated attitudes towards threatened birds as a collective or class, as is attempted in this research.

Table 2.2: Selection of Australian studies focusing on the human dimensions of birds and summaries of the main topics studied. The non-shaded rows indicate studies on aspects of human-bird relationships in general while the three shaded bottom rows list studies relating to the conservation of birds. Symbols (e.g. '*') associate authors with main topics studied.

Research focus	Australian studies	Summary of main topics studied
Birdwatching	*Franklin 2007b	*Socio-demographic characteristics and motivations of birdwatchers
Companion birds	*Franklin 2007a, ^2007b	*Patterns of bird-keeping among members of the public; Acomparison of socio- demographic characteristics and motivations of bird-keepers and birdwatchers
Feeding birds	*Howard & Jones 2004; *Chapman & Jones 2009; *Jones 2011	*Practices of, and motivations for, wild bird feeding
Human-bird conflict	*Jones & Thomas 1998, *1999; *Jones 2008; ^Elix & Lambert 2007;	*Community attitudes towards management of Australian Magpies Gymnorhina tibicen; ^values of shorebird habitat to resolve land use conflict;
Hunting birds	*Franklin 1996, *2008; ^Whitten & Bennett 2002	*Sociology of hunting; ^benefits of duck hunting to wetland owners and hunters
Tourism and birds	*Jones & Buckley 2001; ^Connell 2009; ⁺ Burns 2006, ⁺ 2010; [#] Green & Jones 2010	*Characteristics of birdwatching tourism, its constraints and challenges; ^importance of birdwatching in wildlife tourism; ⁺ managing human-bird interactions in wildlife tourism settings; [#] practices, needs and attitudes of birdwatching tourists
Conservation volunteers	*Weston <i>et al.</i> 2003; *Weston <i>et al.</i> 2006; ^Wolcott <i>et al.</i> 2008	*Socio-demographic characteristics of volunteers and motivations for participation in threatened bird conservation programs in general ^and specifically for the OBP
Flagship birds	*Johnstone 2011	*Suitability of the Endangered Plains-wanderer <i>Pedionomus torquatus</i> as a flagship for threatened grasslands habitat
Threatened bird management	*Antos, Weston & Priest 2006; *Williams <i>et al.</i> 2009; ^Miller & Weston 2009; ⁺ Weston, Antos & Glover 2009; [#] Weston <i>et al.</i> 2012; *Maguire, Rimmer & Weston 2013	*Public awareness of, and attitudes towards, shorebird conservation projects; ^attitudes of ornithologists regarding priority issues facing birds; ⁺ social support for wetland buffers as a conservation tool for birds; [#] landholder attitudes towards conservation of the OBP

2.4 Conclusions

This review of key literature contextualised the research by describing how world views, cultural values and socialisation processes can influence attitudes towards nature and wildlife. It discussed how values are established in individuals and groups and explained some of the major complexities in attempting to understand the relationship between values, attitudes and behaviour regarding wildlife.

A review of research on wildlife values and attitudes described the influence that Kellert's research has on this study in terms of developing a relevant framework for describing the ways Australians value native birds (Chapter 3). An exploration of WVO research in the USA further informed the study with regard to examining societal attitudes and behaviour based on a cognitive hierarchy structure. Franklin's (2007a) Australian study of 'human-animal relations' set a baseline for this research by describing some of the many ways Australians interact with birds and alluding to the bio-political tension evident in values-based conservation strategies adopted in Australia.

Finally, an examination of Australian HDW research on attitudes towards threatened birds demonstrated that interest in birds among HDW researchers is relatively high when considered in the context of HDW studies of wildlife more broadly, but the scope of research conducted was typically limited to a small range of stakeholder groups and species types. Although some studies investigated the attitudes of a range of threatened bird conservation stakeholders, including the public, none explored attitudes towards the conservation of specific threatened bird species indepth and it appears that no-one has previously tried to value birds as a collective or class, as is attempted here.

CHAPTER 3: A Mixed-methods Approach

This chapter describes the methodological approach employed by the study to answer the research questions. Because of the inherent complexity involved in valuing threatened wildlife, and the nature of the research questions, a combination of research methods was deemed appropriate and these were implemented in three stages. This chapter provides a summary of some pertinent strengths and weaknesses of qualitative and quantitative methods in the context of human dimensions of wildlife research; justification for the use of an integrated mixed-methods approach; and a detailed description of the methods used.

3.1 Method selection

This research sought to describe and understand which values for Australian threatened birds are held by members of the public and those with most influence on conservation of threatened birds, to discover what those perspectives mean for threatened bird conservation. This required both a measure of attitudes within the Australian community and an in-depth exploration of the values and attitudes of various stakeholder groups involved in the conservation of threatened birds, meaning that both quantitative and qualitative methods were necessary. Before deciding upon which research methods were most appropriate, major strengths and weaknesses of relevant quantitative and qualitative methodological approaches, particularly in the context of human dimensions of wildlife, were reviewed.

3.1.1 Strengths and weaknesses of the quantitative approach

A major strength of quantitative research in the social sciences compared with qualitative is the possibility of studying large numbers of people and collecting precise, quantitative numerical data which allow quantitative predictions to be made. Quantitative data may have higher credibility compared with qualitative data for biophysical scientists and policy makers who often use numerical studies to assign priorities and make decisions. By studying a statistically representative sample of individuals from a study population of interest or an entire population, quantitative researchers can aim to discover common patterns and relationships across respondents to provide generalised statements about the study topic (Gable 1994). Applying inferential statistics to the data may demonstrate the statistical significance of a finding at a certain level of confidence meaning research results can be relatively independent of the researcher (Stake 2010).

Many different methods can be applied in quantitative research, including the survey. Internet and email surveys are becoming increasingly popular in western nations, probably due at least partly to electronics-driven lifestyles and widely accessible internet connections (Gideon 2012). These kinds of surveys offer some advantages over other survey methods, including: ease of creating and posting, low cost of administration, speed with which data can be gathered and low cost per respondent (Gideon 2012).

However, a major criticism of research that attempts to ascertain people's values and attitudes towards wildlife is the traditional use of surveys which employ affectively neutral, direct question-answer formats rather than direct behavioural observation or in-depth interviews (Dietz, Fitzgerald & Shwom 2005; Satterfield 2001). Surveys tend to elicit expressions of attitudes from participants by asking them to recognise and respond to statements reflecting a particular position on an issue. This may require participants to state their opinion or make 'snap judgements' about things they may not have consciously considered before, and once a position is taken they may feel pressure to continue furnishing responses that demonstrate internal consistency. For a survey to succeed, the right questions must be asked in the right way. For these reasons, the traditional survey has been described as a 'methodology of verification rather than discovery' (Gable 1994, p.3). Further, when conducting one-off surveys or surveys applied at one point in time, only a 'snap-shot' of the situation can ever be recorded, which may yield little information about the underlying meaning of the data (Gable 1994).

3.1.2 Strengths and weaknesses of the qualitative approach

Qualitative research in the social sciences aims to interpret and understand human experience through the viewpoints of individuals, and qualitative methods are often appropriate when studying a phenomenon about which little is currently known (Deruiter & Donnelly 2002). Qualitative methods are particularly useful when there is a need to explore people's various interpretations and understandings of the world (Section 1.3.3). Stake (2010) suggests the best qualitative research is not about how people feel but about how things happen and how things are working. Further, an epistemological strength of 'experiential' research (qualitative research using personal judgment as the main basis for assertions about how something works) is the belief that a range of social factors influence what an individual does. Describing these factors explains how things work from the viewpoints of individual participants and affords the reader a better opportunity to decide for themselves how things work (Stake 2010).

Many different methods can be applied in qualitative research and a key method applicable to this research is the case study. Gable (1994) highlighted three strengths of case study research: the researcher can study a natural setting, learn about the state of the art and generate theories from practice; the method allows the researcher to understand the nature and complexity of the process taking place; and valuable insights can be gained into new topics emerging in the rapidly changing field. Qualitative studies of environmental values may offer a more articulated and profound interpretation of human relationships with, and values for, nature than similar quantitative studies (Campbell & Smith 2006).

Criticisms of the qualitative approach include: it can be subjective and personalistic; its contributions towards an improved and disciplined science may be slow and tendentious; new questions sometimes emerge more frequently than new answers; the results may contribute little to the advancement of social practice; and the ethical risks and the cost can be high (Stake 2010). Further weaknesses include: inability to manipulate independent variables; and risk of improper interpretation (Gable 1994).

Five common misunderstandings about case study research include: theoretical (contextindependent) knowledge is more important than practical (context-dependent) knowledge; one cannot generalise from a single case, therefore the single case-study cannot contribute to scientific development; the case study is most useful in the first stage of a total research process for generating hypotheses, whereas other methods are more suitable for hypothesis testing and theory building; the case study contains a bias towards confirming the researcher's preconceived notions; and it is often difficult to summarise and develop general propositions and theories on the basis of specific case studies (Flyvbjerg 2006). However, Flyvberg concluded that the case study is a 'necessary and sufficient method for certain important research tasks in

the social sciences' (Flyvberg 2006, p.241). Further, the limitations described above can be minimised by conducting multiple case studies where appropriate (Section 3.4.2).

'Value literacy'³⁷ is a particular difficulty in qualitative research examining values whereby study participants are generally not very practiced at identifying or articulating values that are deeply held, privately defended, ethically-charged or not available to consciousness at a moment's notice (Satterfield 2001). This is considered a significant problem because it relegates opportunities for in-depth discussions of environmental values to more experienced debaters such as policy-makers or public agency managers (Satterfield 2001). Added to that is the problem that such lack of ability to be articulate can be perceived, not as a poverty of opportunities for expression, but as a poverty of values on the part of the stakeholder (Satterfield 2001).

3.1.3 Interactive mixed-methods approach

Data for this research were collected using a mixed-methods approach, a key feature of which is 'its methodological pluralism or eclecticism, which frequently results in superior research (compared to monomethod research)' (Johnson & Onwuegbuzie 2004, p.1). To better understand the topic being studied, the research methods were consciously used in an interactive way to study the research phenomenon (Stake 2010). The main methods applied in this research were implemented in three stages (Figure 3.1), including:

- developing an avifaunal attitudes typology by undertaking content analysis of Australian news media stories to ascertain which values are held for Australian birds;
- 2. undertaking a quantitative survey of the Australian public; and
- undertaking multiple qualitative case studies with stakeholders in the conservation of particular threatened bird taxa.

Although the research design followed a social science tradition, it included an examination of ecological and biological literature relating to conservation of threatened wildlife. In this way, the research acknowledges the importance of western scientific knowledge and its influence on the conservation process but does not see it as the only relevant kind of knowledge or values.

³⁷ 'The ability for study participants to verbalise the non-utilitarian qualities and values that best express why nature matters' (Satterfield 2001, p.332).

Stage 1 included conducting a news media content analysis of social values for native bird taxa across Australian society. This research set out to develop an 'avifaunal attitudes typology' (Section 3.2) which could be employed to better understand the various ways in which Australians value native birds. This typology is used descriptively in the remainder of the research to describe Australian attitudes towards threatened birds.

Stage 2 included conducting three quantitative surveys of the Australian public to measure attitudes towards threatened birds. Attitudinal questions included in the survey were informed by the avifaunal attitudes typology so that findings could supplement data collected by the qualitative case studies and provide opportunities for triangulation of research findings from both stages. These data further contributed towards addressing research question 1b.

Stage 3 involved a phase of qualitative case studies including interviews with those directly involved in recovery efforts for specific threatened bird taxa. This reviewed the ways that conservation practitioners talk about particular threatened birds, and an examination of the attitudes they expressed confirmed which held values were most relevant to them. Data from the qualitative interviews contributed towards answering the majority of the research questions (1a; 2a-c; 3a-e). An examination of ecological and biological literature relating to conservation of threatened wildlife was conducted to identify which media were utilised by conservation stakeholders to communicate their conservation messages to policy makers and the public.



Figure 3.1: The three stages of the interactive mixed-methods approach used in this research. Main branches show the three research stages and the chapters in which they are discussed; boxes identify the research questions addressed in each stage; sub-branches summarise the data gathered. Arrows indicate that the typology developed in Stage 1 was subsequently applied in Stages 2 and 3.
In relation to combining data from multiple methods, according to Bazeley (2009, p.204):

'All mixed-methods research involves, as a minimum, integrating conclusions that are drawn from various strands in the research. Meshing of multiple data sources used to reach those conclusions is commonly employed, but blending data or meshing analyses has been much less common...'

Bazeley continues by saying that, where integration during analysis does occur, this is the 'key to unfolding the complex relationships in the topic of the study', and that such integration 'encourages serendipity, stimulates theoretical imagination and initiates new ideas' (Bazeley 2009, p.205). Bazeley cites several examples of strategies for integrating data specifically through analysis rather than as a conclusion and this research has implemented three of the most relevant strategies to facilitate a holistic analysis of findings from the various methods employed (Figure 3.2).

One consideration to note is the sequence in which the qualitative and quantitative phases of this research were conducted. In 2010, an opportunity arose to conduct quantitative surveys of the Australian public, surveys which had not previously been considered feasible due to economic and logistical limitations. This opportunity resulted from the researcher being awarded a small research grant and the opportunity to collaborate with BLA in surveying its network of members. This happened early enough in the research program to allow the quantitative survey methods to be integrated into the overall methodological approach to support the main qualitative findings. Due to the requirements of BLA, the quantitative surveys were conducted prior to the qualitative case studies whereas the reverse would have been preferable as it would have allowed the case study findings to inform the survey aims and focus. The implications of this are considered to be minor, however, given the contribution of new knowledge the survey data provides.



Figure 3.2: Examples of relevant strategies for integrating data through analysis, based on text from Bazeley (2009). Boxes show comparable strategies employed in this research.

3.2 Developing the typology

An important issue in wildlife management and other resource planning is that '...the issue of held social values fits directly into goal-setting processes in which it is necessary to decide what we want, those objects we want being those objects for which we have strong held values' (Brown & Manfredo 1987, p.20).

As discussed in Chapter 2, the categories identified by Kellert related to wildlife in general and Campbell and Smith's related to turtles in particular, therefore it was necessary to determine whether they were applicable to the 1,239 currently recognised bird taxa in Australia (Garnett, Szabo & Dutson 2011). The following process was therefore implemented:

- develop a set of potential categories to most appropriately describe human attitudes towards birds, informed by knowledge of previous wildlife typologies;
- develop methods for obtaining measures of representations of individual native bird taxa in Australian society against each potential category;
- take initial measures of those representations and record which taxa are represented within each attitude category; and
- confirm the relevance of each category for the new typology based on the diversity of measures for which quantitative data could be gathered.

The typology of relevant attitude categories applied in this research and definitions for each category are shown in Table 3.1.

Table 3.1: Avifaunal attitudes typology (as modified from Campbell & Smith 2006; Kellert 1976, 1985; Kellert & Clark 1991).

Attitude	Definition
Aesthetic	appreciation of physical characteristics of birds, including appearance and song; appreciation of birds as objects of beauty (e.g. as represented in artworks)
Biophysical	physical attributes and biological functioning of birds e.g. taxonomy, bird migrations, use of habitat, life history, conducting science
Conservation	birds as threatened species; increase or decrease in bird populations; loss of habitat or nesting ground; contributing to conservation; financial costs associated with conserving threatened species
Ecological	interrelationships between bird species and natural habitats; contribution to well-being and continuity of interrelated flora, fauna and biochemical processes
Experiential	direct contact with, or specific exciting or moving experiences with, birds in their natural habitat; opportunities to encounter rare birds in their natural surroundings
Humanistic	strong affection for or concern for the well-being of individual birds such as pets or wild iconic or rare birds; birds have a strong personal and symbolic meaning, such as association with place, time of day or year
Mastery	mastery and control of birds either literally or metaphorically, typically in sporting situations such as 'twitching' and hunting; may also refer to a sense of getting to know birds well or better; being a good naturalist
Moral	concern for right and wrong treatment of birds, with strong ethical opposition to presumed over-exploitation or cruelty towards birds; belief that birds have inherent rights; responsibility for conserving bird taxa (e.g. via legislation)
Negative	active avoidance of birds due to disinterest, dislike or fear; conflict between birds and humans possibly through competition for resources
Spiritual	birds possessing spiritual significance (e.g. links to Indigenous creation stories or other religious philosophy, such as Buddhism)
Symbolic	symbolic characteristics of birds; transference of bird qualities to human artifacts such as emblems or mascots; expressions of group identity or social experiences and objects of specialised attachments; birds as flagship species
Utilitarian	material benefit of birds and bird products to human society (e.g. food, clothing); material benefit of bird habitat to human society (e.g. development); material benefit of bird characteristics to human society (e.g. professional opportunities)

3.2.1 Media content analysis

The process of developing the typology involved conducting an observational study to look for cultural artefacts reflecting how people value birds in wider society. Kellert (1989) previously identified that a content analysis of newspaper articles is a good source of data that 'adequately reflects the views and behaviours of average 20th century Americans' and can be a reasonably good indicator of public perceptions and use of animals (Kellert 1985, p.19). Media content analysis is considered 'useful, and even irreplaceable, in the study of mass communication, since few other methods yield the unobtrusive and relatively cheap access to synchronic patterns and diachronic trends which it allows' (Franklin & White 2001, p.225).

A media content analysis of bird-related stories in the Australian news media seemed an appropriate method for identifying patterns in Australian perceptions about birds and detecting the existence or not of the suggested avifaunal attitude categories (Table 3.1). Therefore, an analysis was conducted of news media content published in Australia between January 1988 and December 2010. News media content was sourced using 'NewsBank Inc Australia's Newspapers'³⁸. Complete full text content included: news reports, features, opinion/editorials, letters, event listings and reviews. Paid advertisements were excluded. Content sampled is hereafter referred to as an 'article'. Individual database searches were conducted for all known Australian bird taxa using their established common names as per Christidis and Boles (2008), resulting in a total of 67,155 articles which featured the names of 916 individual taxa. The number of articles per taxon name varied significantly: 179 taxa names were not associated with any articles; 268 taxa names were associated with between one and four articles each; 419 taxa names were associated with between 101 and 999 articles each; and 11 taxa names were associated with between 1,000 and 24,572 articles each.

Given the scale of this project and the number of taxa involved, it was decided to analyse a maximum of five articles per taxon name to determine the main attitudes expressed. Where there were more than five articles for a taxon they were sorted using the database's 'best

³⁸ A full-text online newspaper database covering 162 national, regional and local newspapers from all states and territories around Australia (Newsbank Newspapers 2013).

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matches first'³⁹ sort option and every second article was content analysed. If an article was published in more than one source and therefore appeared more than once in the search results list, the duplicate was excluded and the next unique article in the list selected. A total of 2,829 articles was analysed for content (4% of the 67,155 articles identified for all taxa names).

The text of each article was coded using one of the categories in the avifaunal attitudes typology according to the context in which the taxon name was discussed. In many articles more than one attitude was expressed for an individual taxon in which case the attitude with greatest prominence was selected and, if any further doubt remained, the title of the article was deemed to signify the overall intended emphasis. Overall, conservation and ecological attitudes were most frequently recorded for all articles analysed. To illustrate, four out of five articles analysed for the Swift Parrot *Lathamus discolor* were coded as 'conservation' attitudes because of their references to birds as threatened species, increase or decrease in bird populations, loss of habitat or nesting ground or contributing to conservation, as this extract from an article in the *Hobart Mercury* demonstrates:

'Andrew Hingston and Stephen Mallick told the annual gathering in Hobart of Birds Australia (BA) that an explosion in the population of introduced bumblebees was starving the swift parrots of nectar and pollen at vital times' (Knowler 2003).

The following 'Letter to the Editor' of the *Gold Coast Sun* newspaper about the taxon 'Laughing Kookaburra' *Dacelo novaeguineae* was coded as a 'humanistic' attitude because of its reference to concern for the well-being of individual birds and the writer's strong association between the Kookaburra and sense of place, and time of day:

'They call it urban development in downtown Surfers Paradise and fast extending to other suburbs on the coast. To me it's nothing but a concrete jungle. I no longer wake up to a laughing kookaburra and my neighbour's two

³⁹ In the 'best matches first' option the most relevant articles appear at the top of the search results list. Relevancy is determined by a number of different factors including the total number of search terms that appear in the article, a statistical weighting of terms based on their frequency in the database as a whole, and a proximity factor that evaluates where the search terms appear in relation to each other in the article (Newsbank Newspapers 2013).

wise old owls. Hopefully they have moved on to where there is some sunlight to enjoy' (Mitchell 2006).

Some taxa names were used metaphorically, for example as expressions of group identity, and were therefore coded as a 'symbolic' attitude, e.g. a Melbourne band named *Wild Turkey* (Thow 2002).

3.2.2 Refining the typology

The typology was originally developed for examining values and attitudes to Australian birds in general and was refined and verified through application to a broadly-based media content analysis. In this way it was established that the 12 categories initially identified were relevant and applicable to Australian birds since examples of them were readily found, all attitudes expressed could be sorted into these categories and no additional categories were evident. The process of developing the typology revealed three important differences regarding the avifaunal attitudes typology applied here as compared with those of Kellert (Kellert 1976, 1985; Kellert & Clark 1991) and Campbell and Smith (2006) in terms of category names and some definitions.

3.2.2.1 Category names

Most of Kellert's category names (Table 2.1) have been amended slightly in the avifaunal attitudes typology (Table 3.1) and some names have been replaced with terms deemed more appropriate to the newly refined definitions. For example, 'moralistic' has been replaced with 'moral.'

3.2.2.2 Definition of 'negative'

Czech and colleagues (1998) suggest that Kellert's use of the term 'negativistic' is a misnomer when applied to examples of the dispositions he describes as fitting within it (e.g. being afraid to touch a snake, an aversion to insects in the home or a fear of stinging insects, spiders, and scorpions) because his description allows for a 'healthy distancing and even respect' for non-human species. Kellert also described the term 'negativistic' in terms of a desire to avoid animals, including feelings of indifference, dislike, fear and superstition (Kellert 1976). In the avifaunal typology, a 'negative' attitude includes attitudes towards bird taxa that have been formally identified as 'pest' species (e.g. they are listed in national guidelines as a species which can damage horticultural crops) or their behaviour has been regarded as a nuisance or dangerous to humans (e.g. media stories describing Australian Magpies attacking people during their breeding period). Therefore the 'negative' attitude has as its major emphasis a fear or dislike of birds, and includes indifference to birds as a subsidiary emphasis; although evidence for the latter attitude could not be specifically detected during the typology development process it is likely to exist.

3.2.2.3 Definition of 'conservation'

Of note is that some attitudes were expressed about costs associated with conservation efforts for threatened bird taxa; these are an aspect of conservation, hence they have been incorporated into the definition of 'conservation' in the typology.

3.3 Quantitative surveys

3.3.1 Aims and objectives

The aim of this survey research was to increase understanding about how the Australian public values threatened birds and how these values relate to socio-demographic characteristics.

3.3.2 Overall research design

This stage of the research aimed to survey a sample of 500 members of the Australian public about their attitudes towards birds (henceforth called the 'Social Values' or 'SV' survey; Section 3.3.3.2.1). A target of 500 respondents was chosen because this was the largest affordable Australia-wide sample given the funds available. Due to the limited feasibility of reaching chosen target audiences with limited personnel, time and financial resources it was decided to recruit PermissionCorp⁴⁰, an industry-certified online research panel company, to administer an

⁴⁰ PermissionCorp claims to have 'the most accurate representation of the population' with a membership of more than 550,000 active participants who have been recruited via a broad range of online and offline media including television, radio, print, search engines, banners and email (PermissionCorp 2013).

electronic survey which reached a broad cross-section of the Australian public (PermissionCorp 2013).

Empirical social-psychological approaches to measuring attitudes towards wildlife (e.g. Franklin 2007a; Kellert 1976; Manfredo, Teel & Bright 2003) tend to involve: constructing a survey instrument containing questions about values, attitudes and motivations; conducting surveys with groups of interest; and analysing responses, often by factor or cluster analysis, especially to see if particular responses can be statistically grouped into attitude or value scales. An alternative approach is to administer an attitude or value scale already developed by others to test whether responses confirm the validity of the scales.

For this research, a structured, electronic survey instrument comprising 13 precisely worded and ordered questions was specifically designed using Qualtrics Survey Software (www.qualtrics.com) (Appendix 1). It aimed to gather data about attitudes and behaviour relating to birds and the natural environment during a 10 minute online survey.

During the planning stage, an opportunity arose to collaborate with BLA staff members who were interested in conducting online research with members of the public who had joined their Birds in Backyards (BIBY) program and with the general public (henceforth called the 'BIBY' and 'BLA' surveys respectively) about their knowledge and behaviour regarding native birds. BLA intended to distribute their BIBY survey electronically via a database of BIBY program members' email addresses (Section 3.3.3.2.2) and to use a panel company to recruit their general public sample (Section 3.3.3.2.3). Since the objectives, distribution methods and timeframes of both parties' research were similar, some level of collaboration was deemed possible. Therefore the researcher was able to insert a small subset of questions from the SV survey into the BIBY and BLA surveys to take advantage of access to a larger sample of the general public and to compare results of these questions across the three survey samples. Consequently, three online surveys were conducted in early 2011 (Section 3.3.3.2.).

3.3.2.1 Survey limitations

There are certain limitations to the approach described above which are relevant to this research: coverage, non-response rates, sampling and measurement errors (Dillman & Bowker 2001; Duda 2012; Laborde 2012).

In terms of coverage, as opposed to an open web survey which has little or no control over the characteristics of those who voluntarily participate, all three surveys targeted closed populations where all email addresses were available, i.e. members of two online research panels and of the BIBY program. All members of these populations were therefore given an 'equal or known nonzero chance' of participating in the survey (Dillman & Bowker 2001). However defining these survey populations is problematic. For instance, panel members cannot be said to accurately represent the Australian population since they were a subset of Australian households with broadband internet access (73% of households, ABS 2011) who had opted to participate for remuneration in online surveys via the MyOpinions⁴¹ research panel (MyOpinions 2013). Similarly, BIBY members had opted to participate in the BIBY program and were not deemed representative of the entire population of Australian birdwatchers, about which no data currently exist. In other words, both samples were to some extent self-selecting rather than random.

It is well-recognised that responses to mail and telephone surveys are declining but that internet surveys often suffer from lower response rates than mail or other survey modes (e.g. Dillman, Smyth & Christian 2007; Duda 2012; Gigliotti 2011; Laborde 2012) and response rates were found to be low in this survey research (Table 3.3; Appendix 2). However, in mixed-mode surveys comparing both internet and mail survey results, no significant differences between internet and mail survey responses to questions regarding attitudes and policy preferences have been found (Gigliotti 2011; Laborde 2012). Socio-demographic characteristics of the panel members were known prior to distribution of the SV and BLA surveys, therefore it was possible to determine whether those who participated differed significantly from those who did not. However, socio-demographic characteristics of BIBY members have never been collected therefore it is impossible to establish how the final sample differed from the entire BIBY population. The large sample sizes attained from all three surveys (total of 3,823 participants) help to reduce sampling error however inference from survey respondents to any larger

⁴¹ MyOpinions is one of the largest research-only panels in Australia (PermissionCorp 2013). Membership of MyOpinions is free to Australian residents aged 14+ with a valid email address. On completion of a survey, members are rewarded with points which can be redeemed for money (MyOpinions 2013).

population through inferential statistics may not be scientifically justified (Dillman & Bowker 2001). Therefore, contingency table analyses were conducted on the data to identify significant differences between socio-demographic characteristics of the survey samples and those of the Australian population (Section 3.3.4). Further, survey results are discussed in Chapter 4 in terms of their relationship to the samples surveyed, rather than with inference to the national population.

Measurement errors and non-response rates may be increased by difficulties with navigating the electronic survey or with accessing the survey due to incompatible hardware or software (Dillman & Bowker 2001). This was partly countered by using Qualtrics survey software which enables researchers to create sophisticated, user-friendly surveys using a range of pre-tested 'off the shelf' question options, colour schemes and internal logic (e.g. display and skip logic and choice randomisation). Qualtrics software is also compatible with all recent versions of the major internet browser programs, making it accessible to most internet users. Some steps were taken to control for how the survey would appear on individual participants' computer screens given the range of different operating systems, screen configurations and hardware options available.

3.3.3 Methods

3.3.3.1 Key survey questions

For the purposes of this thesis, only the results of some questions were analysed because they were particularly important for addressing one of the major research questions (Q1b). The results discussed in Chapter 4 focus on data from a question relating to attitudes towards threatened birds and associated socio-demographic information.

3.3.3.1.1 Attitudes towards threatened birds

Participants in all three surveys were presented with exactly the same question and were asked to indicate their attitudes towards conservation of threatened birds by stating their level of agreement with 10 attitudinal statements using a five point Likert-type scale (Table 3.2). Statements were designed following the approach developed by Kellert in his research on attitudes towards animals in the USA (Kellert 1976, 1980, 1985; Kellert & Clark 1991) and

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Miller's (2003) study on attitudes towards wildlife in Australia. The questions are not the same as Kellert used, nor has this research attempted to validate Kellert's scales in the Australian population today. Instead, statements were worded to reflect, in very general terms, an attitude from the avifaunal attitudes typology, which was informed by results of the news media content analysis conducted (Section 3.2.1).

Generally, one statement was designed for each of the avifaunal attitudes in the typology, but there were some exceptions to this (Section 4.1.2). For example, there are no statements relating to spiritual and symbolic attitudes because the media content analysis indicated they would not be relevant in the survey context. To explore issues around morality and responsibility for conserving threatened birds, two questions were designed to elicit attitudes towards the moral avifaunal attitude: 'moral-obligation' and 'moral-government'.

The 'curiosity' item represents a combination of the biophysical and ecological categories in the avifaunal attitudes typology; it relates to learning about the biology and ecology of Australian birds (after Miller 2003). The decision to combine these two attitudes into one statement was made based on methods used by others in existing studies on Australian attitudes, and at the time of designing the survey instrument it was not considered necessary to explore biophysical and ecological attitudes separately. On reflection, this made it difficult to directly compare research results about biophysical and ecological attitudes towards threatened birds within the survey respondent and key informant findings.

	Attitudinal Statement
Attitude	If I saw an endangered bird, I might
Aesthetic	think the bird only has a right to live if it's beautiful or unusual
Conservation	regret that humans had caused the bird to become endangered
Curiosity	want to learn more about the bird
Experiential	feel privileged or spiritually uplifted
Humanistic	feel upset if the bird became extinct
Mastery	add it to my birdwatching list
Moral-obligation	think there's a moral obligation to protect the bird
Moral-government	think government is responsible for the bird's survival, not me
Negative	feel it's a nuisance when an endangered bird stops development
Utilitarian	feel the needs of people come before those of endangered birds

Table 3.2:	Relationship	between	avifaunal	attitude	categories	and	attitude	statements
included in quantitative surveys.								

3.3.3.1.2 Socio-demographic characteristics

Socio-demographic information on gender, age, location, income and education was gathered in all three surveys. Although the way these questions were posed differed slightly between the SV and the BLA and BIBY surveys it was still considered possible to compare responses.

3.3.3.2 Individual survey design, sampling strategy and survey administration

A comparison of survey characteristics, methods of survey distribution and data collection, and topics covered is provided in Table 3.3. Survey response rates are presented in Table 3.3 and Appendix 2.

3.3.3.2.1 Social Values survey (SV)

Survey design

The SV survey instrument, as described in Section 3.3.2, was distributed in full to the SV survey sample.

Sampling strategy

A genuinely representative sample of the population is both difficult and costly to achieve, and cannot be unambiguously validated as representative. To match the national population as far as possible given limited financial resources, the SV sample was selected using a 'nonprobability sampling' method. Quotas were set to match the national population for gender, age and geographic location (Proctor 1997). PermissionCorp distributed the survey to panel members with appropriate socio-demographic characteristics, according to the national averages. Some sampling biases are anticipated to exist among respondents: self-selection to join a panel; likely participation in previous panel surveys; and financial motivation to complete surveys.

3.3.3.2.2 Birds in Backyards survey (BIBY)

Survey design

BIBY is a key educational program administered by BLA. Participation in the BIBY program demonstrates an interest in Australian native birds, however active participation in the program varies significantly and members cannot be said to represent the birdwatching community

therefore they are treated as members of the public for the purpose of this research. During 2011, BLA staff conducted an online survey with *c*. 11,500 BIBY members and three key questions from the SV survey were incorporated into this survey (Section 3.3.3.1).

Sampling strategy

BIBY staff recruited participants using a 'probability sampling' method (Proctor 1997) whereby the survey was distributed to all members of the program who had previously agreed to receive information from BLA.

3.3.3.2.3 BirdLife Australia survey

Survey design

As part of their BIBY program evaluation, BLA wanted to compare responses from BIBY participants with those of the broader community; therefore BIBY staff also surveyed the general public. Three key questions from the SV survey were integrated into the BLA survey, as per the BIBY survey (Section 3.3.3.1).

Sampling strategy

As with the SV survey, the BLA survey sample was selected using a 'non-probability sampling' method with quotas set to match the national population for gender, age and geographic location.

Survey characteristic	Social Values	Birds In Backyards	BirdLife Australia
Original sample size	5,839	11,480	4,105
Final sample size (n)	638	2,670	513
Response rate	11%	23%	12%
Target population	General public	General public	General public
Administered by	Researcher via MyOpinions	BLA	BLA via MyOpinions
Distribution	Email invitation	Email invitation	Email invitation
Incentive	Yes	No	Yes
Survey period	16-21 February 2011	7-19 July 2011	6 July-11 August 2011

Table 3.3: Comparison of quantitative survey characteristics and data collection methods.

3.3.4 Analysis

Data were analysed using SPSS (v. 20, SPSS Inc., Chicago, IL, USA), statistiXL (v1.7, statistiXL, WA, Australia) and PRIMER (v6, PRIMER-E Ltd., Plymouth, UK). Descriptive statistics, chi-squared analyses, reliability analysis (Cronbach's α) and General Linear Models (GLMs) were used with an α level of 0.05. Untransformed means \pm one standard error are reported. Non-responses to particular questions were excluded from analyses. It was considered that responses to the same questions in the three different surveys were comparable. Therefore, for these questions, it was decided to pool data for the three survey samples and control for any inter-survey differences by using a three-level fixed factor called 'survey' in the GLMs.

Contingency table analyses were conducted to determine if there were any significant differences in socio-demographic characteristics between the survey samples and the Australian population. A Principal Component Analysis (PCA) with varimax rotation was conducted on the three pooled survey samples to characterise respondents' attitudes towards threatened birds, as revealed by the 10 attitudinal statements (Table 3.2). Two key components were identified in the PCA (which were termed 'avicentric' and 'anthropocentric'). Factor weights were considered substantial if they exceeded 0.5. Two univariate GLMs used factor scores of the avicentric and anthropocentric components from the PCA (as dependent variables) to explore the relationship between attitudes towards threatened birds and socio-demographic characteristics. Results of the quantitative stage of the research are reported in Chapter 4.

3.4 Qualitative case studies

3.4.1 Aims and objectives

The aim of this stage of the research was to provide insight into the social influences at work in threatened bird conservation in Australia. The objective, therefore, was to explore how a range of social factors, including stakeholder attitudes and institutional, policy and operational aspects might affect conservation efforts for particular species of threatened birds. To achieve this, it was necessary to understand how conservation of particular threatened birds worked in practice and to experience conservation efforts as they occurred in particular situations (Stake 2006). This required a review of both natural science and social science literature. This was followed by an examination of the attitudes and motivations of a particular set of stakeholders, who have directly experienced relevant conservation efforts but who were not intended to represent the whole population. Due to the exploratory nature of the research, the small number of potential participants and the complex nature of values, a qualitative multiple case study approach was deemed most appropriate (Campbell & Smith 2006; Proctor 1997; Stake 2006; Yin 2003).

The research aimed to inform future conservation activities, therefore it was necessary to examine how the phenomenon performed in different environments by drawing a purposive sample of cases that would build in variety and create opportunities for intensive study (Stake 2006). Since the objective was to compare social influences on threatened bird conservation efforts, rather than the characteristics and ecology of particular taxa as interpreted by the experts, the taxa themselves were kept as the constant factor within any given case study. Three multiple case studies were selected (Section 3.4.2.1), with each case study focusing on a 'matched pair' of threatened taxa which were similar in their biology, ecology and appearance, but which were considered to have contrasting levels of conservation investment (i.e. six taxa were studied in total). In this way, the analyses could highlight the role of societal and stakeholder attitudes and values on conservation decision-making processes.

3.4.2 Case study design

A case study is defined as a phenomenon of some sort occurring in a bounded context (Miles & Huberman 1994). It is not a specific technique but a way of organising social data so as to preserve the unitary character of the social object being studied (Goode & Hart 1952; cited in Punch 2009). The case may be simple or complex; it can be an individual, a role, an organisation, a policy or process, an incident or event or some other thing (Punch 2009). In multicase research, the cases need to be similar in some ways and can be used as 'an arena or host or fulcrum to bring many functions and relationships together for study' (Stake 2006, p.2).

There are many factors to consider in case study design. Since it appears from the literature reviewed to be the first time an attempt has been made to compare the social context of different threatened birds, protocols for defining the case studies and the methods applied (for example, whether to examine three sets of matched pairs of bird taxa) were based upon

detailed exploration of several features identified and described by Yin (2003). These were: exploratory, descriptive or explanatory case study; literal versus theoretical replication logic; and embedded or multiple case study design.

This research employed an *exploratory* approach which aimed to develop pertinent hypotheses and propositions for further inquiry. Relevant types of questions for this type of case study include 'what' (how many, how much), 'who' and 'where'. These types of studies favour survey strategies or analysis of archival records and are advantageous when the research goal is to describe the incidence or prevalence of a phenomenon, or when the case study aims to generalise to context or predict certain outcomes, for example investigation of prevalent political attitudes (Yin 2003).

To make comparisons across the cases it was vital to replicate key elements of the methodology, such as the use of key informant interviews, as well as the criteria applied when selecting potential candidate species. Further, Yin (2003) suggests that each study should be replicated so it either:

a) predicts similar results (literal replication); or

b) predicts contrasting results but for predictable reasons (theoretical replication).

Both types of replication theory are appropriate to this research. Literal replication theory can be applied within groups of case studies, for example studying individual taxa as 'matched pairs'. Theoretical replication theory can be applied across groups of case studies, for example to generalise findings across the three case studies (Yin 2003) (Figure 3.3).

The rationale for designing multiple case studies can derive from prior hypothesising about different types of conditions and the desire to have subgroups of cases covering each type. Yin (2003) recommends a study should have at least two individual cases within each subgroup so that theoretical replications across subgroups are complemented by literal replications within each subgroup. A multiple case study may consist of multiple holistic cases or multiple embedded cases, depending on the type of phenomenon being studied and the research questions. If the case study examined only the global nature of an organisation or program, a holistic design would have been used here (Yin 2003). In this research, embedded cases were employed because each case study involved more than one unit of analysis, for example where attention was given to a subunit or subunits (the social contexts of two threatened bird taxa). This called for research to be conducted at the main sites for each threatened bird studied and data from key informant interviews became part of the findings for each individual case.



Figure 3.3: Case study design. Pale arrows between case studies 1-3 indicate theoretical replication; dark arrows between matched pairs of threatened bird taxa indicate literal replication.

3.4.2.1 Selection of case study taxa

Since there were 248 threatened bird taxa in Australia (Garnett, Szabo & Dutson 2011) which could qualify to be included in the case study phase, but only scope within the PhD program to examine six, it was necessary to define a set of criteria to assess candidate taxa for inclusion.

Patton (1990) lists 15 strategies for 'purposeful sampling' (in contrast to 'random sampling') and of these, 'maximum variation' sampling was deemed the most appropriate for the purposes of this research because the inclusion of very different cases can deliver the broadest insights into the cases being studied. Therefore, two similar threatened bird taxa existing in contrasting social contexts were deemed most likely to provide valuable insights into the impacts of societal values on conservation success. Patton (1990) also stipulates that the underlying principle should be to select 'information rich' cases, that are worthy of in-depth study. Stake (2006) suggests that when selecting case studies, balance and variety are important, but relevance to the phenomenon being studied and an opportunity to learn are usually of greater importance.

Three main criteria were applied to select appropriate taxa: taxa should be able to be analysed in pairs, thus maximising the opportunity to gain insights from people with common institutional or social interest in both taxa in the pair and examine the ways in which their language and actions differ with respect to the different taxa; the taxa should have contrasting societal investment (e.g. funding, recovery plans, recovery actions, voluntary actions); and taxa should have broadly similar biology/appearance, thus reducing the influence of visual responses to a taxon, for example, that may influence other social responses.

These criteria helped refine the selection process by suggesting a series of questions to be asked about each potential case study candidate. This common linkage is important because it helped make cross-case comparisons during the data analysis stage. The criteria were applied in roughly the following order: family/genus should be consistent within case studies; level of conservation status should vary within case studies; geographic location and jurisdictional overlap should be consistent within case studies; resources invested in recovery should vary within case studies; and amount of data available on species should vary within case studies. Further practical factors involved in selection of case study candidates included: whether key informants could be identified and were willing to participate, whether a wide range of stakeholders was accessible, whether sites where populations of the taxa were located were accessible to make personal observations of them in the field, and whether the time and expense involved in effectively collecting the information was considered appropriate. Between them, the case studies allowed for taxa to be studied in all eight Australian state and territory jurisdictions (Table 3.4; Figure 3.4).

Table 3.4: Six case study taxa, including jurisdictional distribution and key reasons for their selection.

Case Study Name	Taxa studied	Distribution	Key reasons for selection
Yellow Chats	Yellow Chat (Alligator Rivers)	NT	Similar family and genus
(Chapter 5)	Epthianura crocea tunneyi		Different conservation status
	Yellow Chat (Capricorn)	Qld	Different geographic locations / no jurisdictional overlap
	E.c. macgregori		Contrasting levels of resources invested in recovery
			Differing amounts of data available
Migratory Parrots	Orange-bellied Parrot	SA, Tas., Vic.	Similar family and genus
(Chapter 6)	Neophema chrysogaster		Different conservation status
	Swift Parrot	ACT, NSW, SA, Tas., Vic.	Some jurisdictional overlap
	Lathamus discolor		Contrasting levels of resources invested in recovery
			Differing amounts of data available
White-tailed Black-cockatoos	Baudin's Black-cockatoo	WA	Similar family and genus
(Chapter 7)	Calyptorhynchus baudinii		Different conservation status
	Carnaby's Black-cockatoo	WA	Same geographic location
	C. latirostris		Contrasting levels of resources invested in recovery
			Differing amounts of data available



Figure 3.4: Geographic distribution of the six case study taxa. Red (dark) shading indicates main breeding range; grey (light) shading indicates main non-breeding range. (Taxa maps: G. Ehmke, adapted with permission from Garnett, Szabo & Dutson 2011).

3.4.3 Methods

To address the research questions it was necessary to incorporate a mixed-methods approach within each case study including: a desktop analysis of literature pertaining to the case study taxa, a stakeholder analysis and key informant interviews. Each method and its purpose is described below.

3.4.3.1 Desktop analysis

An important part of exploring the multiple constructions of reality that may exist is to study *documentary* or textual constructions of documents produced by different sources. These may include documents such as institutional reports, peer-reviewed scientific articles, organisational newsletters, website content and campaign materials and news media stories. These documentary sources construct 'facts', 'records', 'diagnoses', 'decisions' and 'rules' that are crucially involved in social activities and are an integral part of the everyday lives of conservation practitioners (Hammersley & Atkinson 2007). These documents can provide information about the settings being studied or about their wider contexts. Sometimes this information is not available elsewhere. Indeed, documents can play a central role in the activities taking place within a particular social setting. For this reason it is important to take account of these kinds of documents as part of the social setting under investigation (Hammersley & Atkinson 2007).

A desktop analysis of peer-reviewed scientific literature about both taxa within each case study was conducted to review current knowledge relating to the biophysical, institutional/regulatory and social-structural systems described in the threatened bird conservation policy framework (Section 1.3.9). Data was gathered about the biology and ecology, conservation status and governance⁴², major stakeholders, levels of conservation investment and social and economic considerations for each species. Differences in levels of conservation investment between the two case study taxa were investigated by comparing: recovery program effort, major conservation and recovery projects, research publications listed

⁴² 'The physical exercise of determining influence, and for endangered species where legislation provides for their conservation, government is the instrument that does it' (Martin *et al.* 2012, p.5).

on the Commonwealth Government Species Profile and Threats (SPRAT) Database⁴³, funding levels and key stakeholders involved in conservation of the taxa. Social and economic considerations for the case study taxa were also examined to identify competing interests and values, including: managers of important habitat; contribution of affected parties to conservation of the taxon; impacts of industrial or urban development; availability and sources of recovery effort funding and support; extent of social capital⁴⁴ (e.g. volunteer and landholder engagement); direct economic benefits (e.g. tourism) and risks (e.g. limitations on land-use activities); public profile (e.g. portrayal by the media); and level of public interest.

3.4.3.2 Stakeholder analysis

An important strategy in selecting interview candidates was to identify which individuals within a cross-section of society were deemed to hold the most appropriate knowledge about, and experience in, the conservation of each taxon so their particular attitudes could be analysed and the research questions addressed. A stakeholder analysis was therefore conducted to identify the major stakeholders and their institutions; it drew on a range of sources including advice from experts, published literature, institutional websites and personal knowledge. This process identified the final group of 'key informants' who were invited to participate in the study because they were considered experts in relation to conserving the case study taxa in question; they are a highly selective sample and do not necessarily represent the full range of possible stakeholders.

Some taxa selected for the case studies have a geographic range covering more than one land tenure type, including that under Aboriginal and/or Torres Strait Islander people's ownership. Aboriginal people may contribute to bird conservation through traditional cultural and land practices and Indigenous ranger programs, as well as in other ways. Some of the case study taxa occur on Indigenous Protected Areas⁴⁵ (IPAs) and implementation of management

⁴³ SPRAT provides information about species and ecological communities listed under the *EPBC Act 1999* (DOE 2012).

⁴⁴ 'Social capital' in the context of conservation biology 'captures the idea that social bonds and norms are important for sustainability' (Pretty & Smith 2004).

⁴⁵ An area of Indigenous-owned land or sea where traditional owners have entered into an agreement with the Australian Government to promote biodiversity and cultural resource conservation (Central Land Council [CLC] 2014).

plans for them is reliant on assistance from the Indigenous groups with management responsibility for the lands in question. However, the stakeholder analysis did not identify any Indigenous groups or individuals who were closely involved in the conservation of any of the six case study taxa, hence no Aboriginal people were interviewed in this research.

3.4.3.3 Key informant interviews

Key informant interviews were conducted with appropriate individuals identified during the stakeholder analysis. It was intended to interview approximately 15 key informants per case study (i.e. seven people per taxon or approximately 45 in total). For some taxa however, such as the Alligator Rivers Yellow Chat, it was difficult to find individuals who were sufficiently involved to discuss the matters in hand. For others, such as the Orange-bellied Parrot, it was challenging to narrow down the field of candidates to a manageable number of interviews. In the end, 74 interviews were conducted in total. Although there was an uneven distribution of interviews across the three case studies, the number of interviews conducted per taxon within a case study was reasonably similar. Further details of the key informants interviewed for each taxon and the sectors they represented are provided in Chapters 5 to 7.

Once identified as a potential interviewee, participants were provided with a plain language statement (Appendix 3) and consent form and asked to provide their consent prior to being interviewed. Interviews were conducted either in person or by telephone, April - December 2011. All interviews lasted approximately one hour. To confirm the accuracy of interview transcriptions, participants were provided with an electronic transcription of their interview for approval prior to inclusion in the analysis.

Interview questions were designed to provide answers to the research questions and general contextual information (Appendix 4). Several variations of the interview guide were designed to suit the different types of stakeholders. Although the majority of questions were the same across all interview guides, each version explored the interviewee's role regarding conservation of the case study taxon in slightly different ways depending on the type of stakeholder being interviewed, e.g. landholder, media representative, conservation practitioner or volunteer. Questions were asked about four main topics: role regarding conservation of the case study taxon; values and attitudes towards the case study taxon; values and attitudes

towards birds in general; and how the framing of species as flagships or rare was perceived to affect conservation outcomes.

Direct questions regarding participant values were generally avoided because of the difficulty with 'value literacy' (Section 3.1.2) and to avoid participants potentially overstating the strength of their views in a possible desire to socially conform (Campbell & Smith 2006). Questions were asked in a way that was thought would be meaningful to participants and would allow for subsequent qualitative content analysis, for example: 'What is most important to you about Carnaby's Cockatoo conservation?' The term 'value' was minimally used, but where it was referred to, it was used in a common language sense that participants were expected to understand in general terms.

3.4.3.3.1 Case study sites

As a result of institutional and governance arrangements and distribution of key informants, the following locations were visited during fieldwork:

- Yellow Chat Case Study: Darwin (NT); Rockhampton (Qld);
- Migratory Parrot Case Study: Canberra (ACT); Hobart (Tas); Melbourne (Vic); and
- White-tailed Black-cockatoo Case Study: Perth and surrounding region (WA).

During fieldwork it was also possible to visit key areas of habitat for each of the case study taxa, which provided the researcher with a better understanding of the case study context.

3.4.3.4 Key document analysis

In addition to the desktop analysis (Section 3.4.3.1), a key document analysis was conducted within each case study to identify communication messages issued by stakeholder groups in regard to the case study taxa. This was an analysis of expert opinion and how it is expressed in formal institutional and corporate documents and, by their nature and source, these documents principally represented the views of conservation experts. The analysis examined documents that included the most relevant management strategy for each taxon, including the national

recovery plan⁴⁶ (where one existed), SPRAT profile and a major research publication. These were selected for their specific focus on the case study species (e.g. the taxon's name featured in the title), they exemplified the range of documents available about the taxon and, where possible, were the most up to date record of their type. Sources of documents included: state or territory government agencies responsible for conservation of the taxon; Commonwealth Government SPRAT database; natural resource management agencies; ENGOs; and peer-reviewed scientific literature.

Following Hammersley and Atkinson (2007), all key documents were analysed with the following questions in mind: how are the documents written?; how are they read?; who writes them?; who reads them?; for what purposes?; on what occasions?; with what outcomes?; what is recorded?; what is omitted?; what does the writer seem to take for granted about the reader?; and what do readers need to know to make sense of them? A summary of the key document analysis findings are discussed in Section 8.2.2.

3.4.4 Analysis

3.4.4.1 Case study reports

The three matched pairs were treated as three multiple case studies for the purposes of analysis. Advice was obtained to the effect that this was the appropriate treatment (pers. comm. Stake 2012). Each case study was analysed as a multiple case study and written up as a single report on the pair of threatened birds it covered (Chapters 5 to 7). These reports summarise what was found from each case study about the answers to the major research questions. To gather data for the valuational system identified in the threatened bird conservation policy framework (Section 1.3.9), a set of key questions from the key informant interviews was analysed for their capacity to contribute towards learning about the case study taxa in particular and to identify how differences in stakeholder attitudes may affect the success of threatened bird conservation strategies more generally (Table 3.5).

⁴⁶ It was anticipated that recovery plans for the case study taxa would contain similar content since they were written to a prescribed set of guidelines with specific content requirements (DSEWPaC 2011).

All studies were treated as even-handedly as possible so that all relevant aspects of the cases were presented without over-emphasising either the positives or negatives (Stake 2010). Part of the analysis process involved interpreting responses to key questions in terms of the attitudes expressed within comments made and with reference to the specialised way the term 'value' is used in the social sciences. This process was carried out in a systematic way for each question in turn by examining participants' responses and identifying similar views so the concepts discussed could be summarised and interpreted according to the context. In this way the most prevalent opinions and attitudes expressed by participants could be presented in the case study report. An attempt was made to identify and present a diversity of views within the limitations of the case study methods. The aim of this process was to discover contextual factors that may be important influences on outcomes of future similar cases, i.e. to generalise to context.

For consistency and to assist with cross-case analysis, the three case studies are reported in the same way and in the same order. Results are reported, according to the four major systems identified as influencing threatened bird conservation policy (Section 1.3.9) in two main sections:

- 'Desktop analysis and nature of the fieldwork undertaken' presents data relevant to the biophysical, institutional/regulatory and social-structural systems. Data are derived from an analysis of key literature pertaining to the case study taxa. The section includes socioeconomic profiles of the two case study taxa and describes the nature of the fieldwork undertaken and interviews conducted; and
- 'Key informant interview analysis' presents data relevant to the valuational system. It addresses each of the three major research questions in turn and describes key informant responses to specific interview questions (Table 3.5).

Major research question	Key informant interview question
Background information	Who or what were the major influences on your attitudes
How do Australians value threatened birds?	How would you describe your attitudes towards birds and threatened bird compared with other kinds of wildlife?
	Is conservation of threatened birds important to the Australian public?
Who is involved in threatened bird conservation and how do	Who would you consider to be the key organisations involved in conservation of the case study species?
they communicate their values?	Who has most influence on threatened bird conservation and what are their motives for conserving threatened birds?
	What messages do stakeholders communicate to the public?
Do the values held for particular species of	How did you get involved with the case study taxon?
threatened birds affect the success of strategies to conserve them?	What is most important to you about conservation of the case study taxon?
	Do you personally believe that conservation efforts for the case study taxon will succeed or fail?
	Is it important to you that a population of the case study taxon exists in the wild?
	Can the local community influence conservation of the case study taxon?
	Which significant characteristics lead to a species' status as a key or iconic threatened species in terms of political decision making, significant events and social attitudes?
	Do you think use of flagship birds is an effective way to educate the public about broader conservation issues?
	Would the case study taxon make a good flagship bird for your region?

Table 3.5: Key informant interview questions analysed in the three case study chapters.

3.4.4.2 Analytical techniques applied

Three principal techniques were applied in the analysis of the case studies: analytic induction, coding and triangulation.

Analytic induction involves the systematic examination of similarities to develop concepts or ideas (Punch 2009). Among other things, Hammersley and Atkinson (2007) define it as a process of framing a hypothetical explanation on the basis of analysis of the data designed to identify common factors across the cases. However, this assumes that social phenomena are governed by deterministic laws and denies the capacity of people to make decisions about how to act. Consequently, the validity of a hypothesis can never be known with absolute certainty, the hypothesis can only be supported or refuted (Hammersley & Atkinson 2007).

The case study data were analysed using the software program NVivo (v. 10, QSR International Pty Ltd, Doncaster, Victoria, Australia). Transcriptions of key informant interviews were imported into NVivo then manually coded by the researcher to identify patterns and theories of attitudes and the attitude categories they represented. Individual coding nodes⁴⁷ were created in NVivo for each of the 12 attitudes defined in the avifaunal attitudes typology (Table 3.1) and text was coded under one or more nodes depending on the attitude(s) expressed. Stake (2010, p.151) defines coding as: '...a common feature of ... all qualitative analysis and synthesis. Coding is sorting all data sets according to topics, themes and issues important to the study.' During the process of coding a researcher may impart their personal bias and/or interpretations on the coding process. However, the data may be rendered less subjective by looking at many cases of the same phenomenon (e.g. comparing much data from many different participants) and, through a process of correcting for bias, corrections are conceptualised into categories and their properties become abstract of researcher interpretations (Glaser 2007). To give some examples of coding, this comment: 'Personally I'd miss hearing the cockatoos around here' can be interpreted as reflecting a sense of loss associated with losing the personal experience of individual living birds and was therefore

⁴⁷ A collection of references about a specific theme, place, person or other area of interest. References are gathered by 'coding' sources such as interviews, focus groups, articles or survey results (NVivo 10 2014).

primarily coded under the 'humanistic' node. Meanwhile, the following comment discusses the ecological relationship between a taxon and its habitat and was primarily coded under the 'ecological' node: '...they actually fill a niche that no other bird fills, which is interesting... there's no other bird living in that particular exact habitat in the region.'

To ensure that valid information and interpretations were obtained, findings were triangulated by highlighting where similar views of the same thing were described by multiple observers. Different views were also reported where they were deemed to contribute important information about the phenomenon. In some cases, themes were illustrated by direct quotations with the participant's job description used to label their words (e.g. C#12 State government). Exact job titles were not used to ensure anonymity. The triangulation process helped to clarify meaning by identifying the multiple contexts within which the stakeholders lived and the diversity of opinions they held about the case study taxa (Stake 2006).

In this way, it was possible to make assertions about the influence of social context on success of conservation efforts for each pair of taxa and to examine how the phenomenon performs in different environments (Stake 2006).

3.4.4.3 Cross case study synthesis

To further understand the phenomenon being studied, findings from the three case studies were analysed to explore both the similarities and differences within and between the three studies and to identify the most important findings from each (Chapter 8). For these purposes, the method 'Track II: Merging Case Findings' described by Stake (2006) was applied.

Chapter 8 synthesises key findings from the various research strategies employed in the mixed-methods approach, for example exploring patterns in key informant perspectives and key documents arising from the three case studies and integrating public perspectives as identified in the surveys. Findings are reported in much the same way and order as the individual case study reports. The synthesis is presented in the context of the major research questions and in this way it was possible to generalise about how threatened birds were valued by those directly involved in conserving them.

Two additional analyses were conducted on the synthesised case study findings (Section 8.2.1.2). During the analysis stage, individuals' responses were transcribed then attitudes were

coded in NVivo by the attitude(s) expressed. Hence, it was possible to calculate the percentage of individual interviews coded by each attitude and identify which attitudes were most commonly expressed by individual key informants. To rank the overall expression of attitudes by all key informants combined, the average occurrence of individual attitude percentages was calculated then sorted in order of highest to lowest frequency of expression. Key informant attitudes were grouped by the relevant case study to allow for cross-case comparisons to be made (Figure 8.2). This treatment was applied a second time to the key informant interviews but in this case similar types of key informants were grouped into the five societal sectors they represented, including government, non-government, scientific, public and private. In this way, the overall expression of individual attitudes could be compared across the different stakeholder groups (Figure 8.3).

3.5 Statement of ethical clearances

This thesis is created from original studies and investigations sourced from quantitative, qualitative and mixed-methods approaches. Other than the research presented in Chapters 4 to 7, all empirical data was derived from publicly available secondary sources and did not require ethical clearances for their access and use. Ethical clearances were obtained for the quantitative and qualitative research and data presented in Chapters 4 to 7 of this thesis by formal application to the Charles Darwin University Human Research Ethics Committee (HREC) using the National Ethics Application Form. The HREC approval number and date of approval were: H10030, 16/07/2010.

3.6 Conclusions

This chapter outlined the methodological approach used to address the major research questions. In describing the process of selecting the approach, the chapter has reviewed some key strengths and weaknesses of quantitative and qualitative methods and justified employing an interactive mixed-methods approach. The chapter described the main methods employed across three stages of the research and the strategies used to integrate findings from different methods. Importantly, the chapter has described the process of developing an avifaunal attitudes typology which is used descriptively throughout the thesis to describe Australian attitudes towards threatened birds. Use of the typology throughout the research facilitated triangulation of findings from the three research stages. The aims and objectives, design strategy and methods of gathering data and conducting analysis were presented for the three stages.

The next chapter presents data gathered via three quantitative social surveys conducted with members of the Australian public and demonstrates how Australians value threatened birds.

CHAPTER 4: Public Attitudes towards Threatened Birds
This chapter discusses key findings from an attitudinal study conducted to examine the relationship between attitudes of the general public towards threatened birds and sociodemographic characteristics. It addresses the major research question 'How do Australians value threatened birds?' and the sub-question 'How do the values held for threatened birds relate to socio-demographic characteristics?' Key findings from three quantitative surveys of members of the Australian public are presented here.

4.1 Results

4.1.1 Survey sample characteristics

Three online surveys (Appendix 1) were conducted to examine how Australians value threatened birds by gathering quantitative data on public attitudes. The following samples were obtained using methods described in Chapter 3: Social Values (SV) sample (n = 638 respondents); BirdLife Australia (BLA) sample (n = 513); and Birds in Backyards (BIBY) sample (n = 2,667). Response rates of 11%, 12% and 23% were achieved for the SV, BLA and BIBY surveys respectively (Appendix 2). To examine the representativeness of the survey samples, socio-demographic characteristics of the respondents to each survey were compared with those of the national population as recorded in the last Australian Census of Population and Housing (ABS 2011a, b, c) (Figures 4.1 to 4.5). Contingency table analyses demonstrated an overall sample bias towards females, older age groups, NSW residents, the more highly educated and people not in the labour force (e.g. helpers, homemakers, primary caregivers, retirees and the unemployed) (Appendix 2). This bias was especially evident in the BIBY sample.



Figure 4.1: The gender of survey participants in relation to gender of the Australian population (ABS 2011a) (in this and the following figures sample size is present in brackets on the horizontal axis).



Figure 4.2: The age of survey participants in relation to age of the Australian population (ABS 2011a).



Figure 4.3: The geographic location of survey participants in relation to the geographic distribution of the Australian population (ABS 2011b).



Figure 4.4: Highest level of education of survey participants in relation to the Australian population (ABS 2011c).



Figure 4.5: Current employment status of survey participants (49 respondents overall did not answer this question; comparable data was not available for the Australian population).

4.1.2 Australian attitudes towards threatened birds

To identify attitudes towards threatened birds, participants from all survey samples read the following statement and indicated their level of agreement with 10 attitude statements (Section 3.3.3.1.1) (Table 4.1):

'Many of Australia's birds are endangered (1 in 5 species) and it's uncommon to see an endangered bird in the wild. Thinking about how you would feel if you knew you had seen an endangered bird, how much do you agree or disagree with these statements?'

Attitude	Attitude statement	
	If I saw an endangered bird, I might	
Aesthetic	think the bird only has a right to live if it's beautiful or unusual	
Conservation	regret that humans had caused the bird to become endangered	
Curiosity ⁴⁸	want to learn more about the bird	
Experiential	feel privileged or spiritually uplifted	
Humanistic	feel upset if the bird became extinct	
Mastery	add it to my birdwatching list	
Moral-government	think government is responsible for the bird's survival, not me	
Moral-obligation	think there's a moral obligation to protect the bird	
Negative	feel it's a nuisance when an endangered bird stops development	
Utilitarian	feel the needs of people come before those of endangered birds	

Table 4.1: Relationship between avifaunal attitude categories and attitude statements in quantitative surveys.

On the whole, survey respondents expressed concern about threatened birds (Figure 4.6). In particular, they agreed with statements relating to humanistic (90%), conservation (89%), moral-obligation (86%), curiosity (83%) and experiential (77%) attitudes most strongly. Further, 61% disagreed that 'government is responsible for the bird's survival, not me', while 10% would delegate responsibility to government (moral-government). Finally, 59% thought the needs of threatened birds can come ahead of those of people while 14% thought otherwise (utilitarian).

⁴⁸ For the purposes of this question, the curiosity statement represents a combination of biophysical and ecological attitudes from the avifaunal attitudes typology (Table 3.1).



Figure 4.6: Percentage of all survey participants from the three quantitative surveys combined who agreed or strongly agreed with statements relating to attitudes towards threatened birds (n=3,689).

4.1.3 Two value orientations of threatened birds

A Principal Component Analysis (PCA) explored patterns of responses to the 10 attitudinal statements. Data from the three survey samples were pooled and any non-responses to this question were removed (leaving a combined sample size of n = 3,689). The PCA revealed eight components explaining > 5% of the variation in the data (combined 91%). Rotated component scores of > 0.5 were used to examine relationships and assign labels to components. Two components with eigenvalues greater than 1.0 were selected because they represented 49% of the total variance, were internally consistent and contained associations with at least two component scores (Table 4.2).

Table 4.2: Results of the Principal Component Analysis. Rotated component scores for pooled survey data are shown for the two components selected for further analysis, in order of highest to lowest component loading (n = 3,689). Values in bold are those with a loading of > 0.5.

Attitude Attitude statement (variable)		Component score	
	If I saw an endangered bird, I might	Avicentric	Anthropocentric
Curiosity	want to learn more about the bird	0.795	-0.118
Experiential	feel privileged or spiritually uplifted	0.724	-0.145
Humanistic	feel upset if the bird became extinct	0.720	-0.157
Moral-obligation	think there's a moral obligation to protect the bird	0.715	-0.141
Mastery	add it to my birdwatching list	0.697	-0.007
Conservation	regret that humans had caused the bird to become endangered	0.675	-0.185
Negative	feel it's a nuisance when an endangered bird stops development	-0.147	0.679
Aesthetic	think the bird has a right to live only if it's beautiful or unusual	-0.087	0.654
Utilitarian	feel the needs of people come before those of endangered birds	-0.123	0.620
Moral-government	think government is responsible for the bird's survival, not me	-0.068	0.535

Component 1 can be summarised by the label 'avicentric', with higher scores indicating greater avicentrism. Component 1 explained 35% of the variation in the data and contained six positively loaded statements that are indicative of a range of attitudes that promote the interests of threatened birds before those of humans. Component 2 can be summarised by the label 'anthropocentric'⁴⁹ with higher scores associated with greater anthropocentrism. Component 2 explained 13% of the variability in the data, and contained four positively loaded statements that are indicative of attitudes promoting the interests of humans before those of threatened birds.

The avicentric and anthropocentric components identified by the PCA suggest that two broad and distinct value orientations (Section 2.2.2) of threatened birds exist among respondents.

4.1.3.1 Avicentrism

Of the six statements substantially positively associated with the avicentric component, the curiosity statement was most strongly associated overall, followed by the experiential, humanistic, moral-obligation, mastery and conservation statements (Table 4.2). Based on the attitudinal statements presented, this suggests that among those expressing an avicentric value orientation, there is a keen interest to learn more about threatened birds which is characterised by a complex mix of attitudes including: on an individual level, a sense of wonder, fear of loss and elitism (e.g. seeking status among other birdwatchers by sighting a threatened bird); and on a societal level, guilt, obligation and a desire to make amends.

4.1.3.2 Anthropocentrism

Of the four statements substantially positively associated with the anthropocentric component, the negative statement was most strongly associated with anthropocentrism followed by the aesthetic, utilitarian and moral-government statements. These results indicate that those expressing an anthropocentric value orientation would put the needs of humans before those of threatened birds and reveal a personal disconnection from nature as suggested

⁴⁹ 'Anthropocentric' is used here specifically in regard to attitudes towards threatened birds.

from the lack of concern for non-aesthetically pleasing birds and willingness to delegate to government responsibility for the survival of threatened birds.

4.1.4 Characterising those who express avicentric and anthropocentric value orientations

4.1.4.1 Characterising avicentrism

To investigate any relationships between avicentrism and socio-demographic factors, a General Linear Model (GLM) of the avicentric component scores (where higher values reflect higher levels of avicentrism) was conducted on four fixed factors: gender, age category, education and survey type (including all interactions; adjusted $R^2 = 0.245$). Two significant terms (age by survey, F _{10, 3549}= 5.917, p < 0.001; and a main effect of survey, F _{2, 3549}= 205.637, p < 0.001) were not of primary interest. A main effect of gender was significant, indicating males and females differed in relation to avicentrism (females, -0.284 ± -0.141; males, -0.649 ± -0.493; F _{1, 3549}= 37.939, p < 0.001) and a three way interaction was significant (gender by age by education, F _{15, 3549}= 1.818, p = 0.027).

Three way interactions can be very difficult to understand and describe intuitively; to aid interpretation, estimated marginal mean scores of gender as a function of age and level of education were plotted to highlight patterns of avicentrism within the three factors (Figure 4.7). Once plotted, socio-demographic patterns became clearer: women were typically more avicentric than men, and avicentrism tended to increase with age and level of education, although the relationship between age and likelihood of avicentrism, particularly for those aged between 25 to 54 years, was complex.

These findings indicate that, on average, those who expressed an avicentric point of view were more likely to be female, older, and more highly educated.

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Public attitudes towards threatened birds



Figure 4.7: Estimated marginal mean scores from the three way interaction 'gender by age by education' showing 'level of avicentrism' (Principal Component scores, where high scores indicate high level of avicentrism), (n = 3,689).

Examining the percentage of agreement with statements by respondent age can further clarify underlying socio-demographic patterns in attitudes towards threatened birds. Bearing in mind a slight bias in the survey samples towards older respondents (Figure 4.2), expression of avicentrism (i.e. agreement with curiosity, experiential, humanistic, moral-obligation, mastery and conservation attitudinal statements) towards threatened birds increased with age but was particularly strong among those aged 35 upwards (Figure 4.8). The opposite was typically true regarding expression of anthropocentrism (i.e. agreement with negative, aesthetic, utilitarian and moral-government attitudinal statements).

Some exceptions to these trends were seen amongst the youngest (18-24) and oldest (65+) age groups, where respondents' levels of agreement often differed from those in other age groups. This was especially true of the oldest participants (65+) who were slightly less likely than those aged 55-64 to agree with statements relating to avicentrism, except in relation to agreement with the statement '...regret that humans had caused the bird to become endangered.' Although a tendency to agree with the statement '...an endangered bird only has a right to live if it is beautiful or unusual' was expressed by only a small percentage of respondents overall, and increased with age, it was young adults who were most likely to strongly agree with the statement '...government is responsible for the bird's survival, not me.' The youngest and oldest age groups were most likely to agree with the statement '...it's a nuisance when an endangered bird stops development.'

Public attitudes towards threatened birds



Figure 4.8: Percentage of respondents in each age group from pooled survey data who agreed or strongly agreed with statements relating to avifaunal attitudes (n=3,689).

4.1.4.2 Characterising anthropocentrism

To investigate any relationships between the measure of anthropocentrism and sociodemographic factors, a GLM of the anthropocentric component scores (where higher values reflect higher level of avicentrism) was conducted on four fixed factors: gender, age category, education and survey type (including all interactions; adjusted $R^2 = 0.057$). A three way interaction bordered on significance (age by education by survey, F _{29, 3549}= 1.459, p = 0.054), however, three main effects were clearly significant (survey, F _{2, 3549}= 22.961, p < 0.001, which was not of primary interest), gender (females, 0.028 ± 0.132; males, 0.164 ± 0.338; F _{1, 3549}= 11.279, p = 0.001) and level of education (Year 12 or below, 0.209 ± 0.378; vocational qualification, 0.062 ± 0.268; bachelors degree, -0.148 ± 0.084; postgraduate degree, 0.013 ± 0.341; F_{3, 3549}, =6.600, p < 0.001). Post hoc comparisons revealed that only those with bachelors and postgraduate degrees did not differ significantly in terms of anthropocentrism (p = 0.552), while all other educational categories differed from one another (Appendix 2).

Thus, males tended to be more anthropocentric than females. Respondents educated only to Year 12 or below were more anthropocentric than those with vocational training, who themselves were more anthropocentric than those with a university education.

4.2 Discussion

4.2.1 Values held for Australian threatened birds

A key finding of this study is the existence of two broad value orientations regarding threatened birds within the survey samples: avicentrism, which tends to place the needs of threatened birds before those of humans; and anthropocentrism, which tends to place the needs of humans before threatened birds. The existence of avicentric and anthropocentric value orientations implies there are two broad patterns of attitudes towards threatened birds within the broader community. There is potentially a continuous spectrum of value orientations but people tend to be positioned towards one end or the other of this spectrum. Hence it is legitimate to say they have primarily an avicentric or an anthropocentric value orientation – as confirmed in this study.

Avicentrism was associated with attitudes that support conservation of threatened birds, including curiosity, experiential, humanistic, moral-obligation, mastery and conservation avifaunal attitudes. Although it is difficult to make direct comparisons with other studies, because of differences in objectives and methods used, it is worth comparing the results of this study with those of others conducted on public attitudes towards wildlife in Australia. An assessment of five key studies (Aslin 1996; Fitzgibbon & Jones 2006; Franklin 2007a; Franklin & White 2001; Miller 2000) (Section 2.3.1) revealed that attitudes towards wildlife in general were very similar to those held by respondents expressing higher levels of avicentrism, in particular relating to experiential, curiosity, moral and humanistic attitudes.

Anthropocentrism was associated with attitudes relating to personal disconnection from nature and willingness to delegate to government responsibility for the survival of threatened birds as reflected by a correlation with negative, aesthetic, utilitarian and moral-government attitudes. The five key attitudinal studies explored in Section 2.3.1 support the existence of such attitudes in Australian society (Aslin 1996; Fitzgibbon & Jones 2006; Franklin 2007a; Franklin & White 2001; Miller 2000), particularly with regard to negative and utilitarian attitudes. Section 1.2.7 introduced some examples of human-bird conflict that may engender fear or dislike of birds and that could shed further light on expressions of anthropocentrism.

Although people expressing higher levels of anthropocentrism are not necessarily against conservation of threatened birds, the occurrence of two differing views could lead to conflict in certain situations, for example where decisions about prioritising the needs of humans over threatened birds, or vice versa, must be made. Two broad value orientations regarding societal attitudes towards wildlife and nature have been found in major North American studies among those holding opposing wildlife value orientations (Kellert 1980; Teel & Manfredo 2009) (Sections 2.2.1; 2.2.2). These studies suggested the greatest potential for conflict and misunderstanding on animal and wildlife-related issues existed primarily between those who treat animals or wildlife in companionate or moral terms and those who prioritise human wellbeing over animals or treat wildlife in utilitarian terms (Kellert 1980; Teel & Manfredo 2009).

Teel and Manfredo (2009) describe this approach to categorising people via their value orientations as providing many advantages over using more traditional socio-demographic

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characteristics. They considered it particularly useful for enhancing understanding of different wildlife-related interests, bridging the gap between wildlife agency culture and public values, and addressing the challenge of increased social conflicts on wildlife issues.

4.2.2 Relationship between values held for threatened birds and sociodemographic characteristics

Levels of avicentrism were higher among females who were older aged and tertiary educated while levels of anthropocentrism were highest among males who were younger aged and non-tertiary educated. This is broadly consistent with other studies investigating relationships between socio-demographic characteristics and 'pro-environmental'⁵⁰ attitudes and behaviour (Section 2.1.3). It is likely that levels of ecological concern and avicentrism are affected by social norms and expectations, available knowledge and skills or access to resources (Claus, Chan & Satterfield 2010; Dietz, Fitzgerald & Shwom 2005; Leiserowitz 2006; Leiserowitz & Fernandez 2008).

Reflecting attitudes expressed by those with higher levels of avicentrism and anthropocentrism, studies have shown that women are more likely than men to express a desire to learn about and interact with wildlife, to express a love of animals, and to demonstrate moral concern for animals (e.g. Herzog 2007; Kellert & Berry 1987; Miller 2000). Teel and colleagues (2006) found that Americans described as traditionalists or utilitarians possessed similar socio-demographic and lifestyle characteristics which differed from those of mutualist individuals, including a greater likelihood to be male (Teel, Dayer & Bright 2006; Teel & Manfredo 2009).

The relationship between age and wildlife attitudes is complex and some age-related findings in this study vary from other similar studies discussed in Section 2.1.3.2. For example, the finding in this study that the youngest participants (18-25) strongly agreed with statements regarding placing the needs of threatened birds before those of humans, contrasted with the findings of Kellert (1993) and Miller (2000) which linked these kinds of attitudes to older age groups. There was greater consistency between the findings of this study and others regarding

⁵⁰ Consciously seeking to minimise the negative impact of one's actions on the natural and built world (Kollmuss & Agyeman 2002).

strong expression of humanistic attitudes towards wildlife across all age groups as well as an association between youngest and oldest groups and interest in learning about and interacting with wildlife (e.g. Miller 2000). Both Miller's 2000 study and this one are consistent with Blaikie's Australian study that found middle aged people showed strongest commitment to an ecological world view (Blaikie 1992; Miller 2000).

The relationship between attitudes towards wildlife and level of education appears to be relatively straightforward, with higher levels of education being positively associated with higher levels of avicentrism. These findings are consistent with many others discussed in Section 2.1.3.3 (e.g. Franklin 2007a; Kellert 1993; Miller 2000; Tranter & Pakulski 1998).

Finally, according to Franklin's studies of post-colonial attitudes towards birds in Australia, Australians who support environmentalism are not the same Australians who keep native birds as companions and this separation can be explained by Australian class cultures (Franklin 2007b). Franklin found that those who actively supported environmentalism tended to be higher paid, white-collar professionals, tertiary educated and living in capital cities, and believed that a bird's life is better if it is wild, free and undisturbed by humans (Franklin 2007b). Conversely, those who kept birds tended to be lower class, blue-collar or retail workers, nontertiary educated and rural living, and seemed to focus on close relationships with birds that are based on mutual care (Franklin 2007b). Socio-demographic distinctions between these two groups appear to resemble the distinctions between avicentrics and anthropocentrics, although further research is required to draw any firm conclusions in this regard.

4.3 Conclusions

This study has contributed to our understanding of how Australians value threatened birds and how the values held relate to socio-demographic characteristics. The findings indicate that concern for threatened birds was widespread among survey respondents, suggesting they are important stakeholders in threatened bird conservation strategies. Secondly, two broad and distinct value orientations were found to exist: avicentrism and anthropocentrism, which were characterised by clear patterns of socio-demographic characteristics that help to socially locate individuals holding these value orientations. The findings inform us about how those holding high levels of avicentrism and anthropocentrism among the Australian population may have

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different priorities concerning threatened bird conservation. This information may assist managers of threatened birds to develop effective conservation strategies that appeal at a public interest level. **CHAPTER 5: Yellow Chat Case Study**



Image 5.1: Male Capricorn Yellow Chat *Epthianura crocea macgregori* perched in native vegetation, Bajool, Queensland. Credit W. Houston.



Image 5.2: Male Capricorn Yellow Chat *Epthianura crocea macgregori* caught for banding at Glenprairie, Queensland. Credit W. Houston.

This case study focuses on two subspecies of Yellow Chat: the Alligator Rivers subspecies *Epthianura crocea tunneyi* and the Capricorn subspecies *E. c. macgregori* (Image 5.1; Image 5.2). Both occur in tropical Australia; the former is restricted to the Top End of the Northern Territory and the latter is restricted to the Capricorn region of Queensland. They are similar in appearance, biology and ecology and are listed as threatened under Commonwealth and state/territory legislation. This chapter explores the attitudes held by key stakeholders towards these two subspecies and investigates whether attitudes are correlated with achieving conservation outcomes. A summary of key differences between the two subspecies is provided in Appendix 5.

5.1 Desktop analysis and nature of the fieldwork undertaken

5.1.1 Biophysical system

5.1.1.1 Biology and ecology

The Yellow Chat is an endemic Australian bird of the honeyeater family (Meliphagidae) and is one of five chat species occurring in Australia. There are now considered to be three subspecies of *E. crocea* which are widely dispersed across northern Australia: the nominate subspecies *E. c. crocea* (northern arid Australia); the Alligator Rivers subspecies *E. c. tunneyi* (coastal Top End, Northern Territory [NT]); and the Capricorn subspecies *E. c. macgregori* (Capricorn coast, eastern Queensland [Qld]) (Schodde & Mason 1999). The latter is still sometimes referred to as the Yellow Chat (Dawson) following Garnett and Crowley (2000).

Yellow Chats are small birds, approximately 11cm long and about 9g in weight. The adult male breeding plumage is bright yellow with a black band across the chest while females are paler lemon in colour and without the chest band (Department of Sustainability, Environment, Water, Population and Communities [DSEWPaC] 2013a, b; Woinarski & Armstrong 2006). Their diet is mostly invertebrates. They are thought to have a life expectancy of about three years or more and may breed two or three times per year. Both subspecies inhabit coastal saltpans and use shallow drainage channels and depressions supporting a mosaic of vegetation such as samphire shrublands (DSEWPaC 2013a, b; Woinarski & Armstrong 2006). They differ marginally

in the colour of their plumage and width of the male breast band from the more widespread inland subspecies (Schodde & Mason 1999).

5.1.2 Institutional/regulatory system

5.1.2.1 Conservation status and governance

A summary of distribution, population, status, threats, conservation objectives, management actions, conservation investment and affected parties for both chat subspecies is provided in Table 5.1. Legislative responsibility for the taxa lies with both the Commonwealth and the relevant state or territory governments. The Alligator Rivers subspecies is listed as 'Endangered' under both the *Environment Protection and Biodiversity Conservation Act 1999* (*EPBC Act 1999*) and the NT *Territory Parks and Wildlife Conservation Act 2000* (TPWCA) (Department of Land Resource Management [DLRM] 2012; DSEWPaC 2013a). The Capricorn subspecies is listed as 'Critically Endangered' under the *EPBC Act 1999* and 'Endangered' under the Qld *Nature Conservation Act 1992* (*NCA 1992*) (DSEWPaC 2013b; Houston & Melzer 2008). Both subspecies face some common threats and it would appear that early European settlers may have introduced some of the threatening processes including the impacts of water buffalo *Bubalis bubalis* (Natural Resources, Environment, The Arts and Sport [NRETAS] 2007a), cats *Felis catus* (NRETAS 2007b; Pest Animal Management Queensland [PAMQ] 2008) and domestic pigs *Sus scrofa* (Department of Employment, Economic Development and Innovation [DEEDI] 2010; NRETAS 2007c).

Alligator Rivers subspecies

The Alligator Rivers subspecies has been recorded in three conservation reserves: Harrison Dam Reserve, Kakadu National Park (KNP) and Mary River National Park (Woinarski & Armstrong 2006). Occasional records occur between Oenpelli and Darwin but these are thought to be dispersed individual members of a single subpopulation (Garnett, Szabo & Dutson 2011).

The subspecies was identified as endangered by contributors to BLA's Atlas of Australian Birds because of its apparent decline in population numbers between surveys conducted over a number of years; few recordings between its first (1984) and second (2003) surveys led to its proposed nomination for listing under the *EPBC Act 1999* (Armstrong 2004). The most systematic assessment of its status in 2004 found 96 individuals (Armstrong 2004). No individuals were found during a monitoring program in KNP between 2007 and 2009 (Woinarski *et al.* 2012) and the population is estimated to be less than 300 individuals (Garnett, Szabo & Dutson 2011).

Although six of the NT's threatened birds currently have recovery plans, there is no recovery plan in existence for this subspecies. However, a two page Threatened Species Information Sheet describing its status and conservation and management priorities was produced by the NT Department of Land Resource Management (DLRM) in 2006 (Woinarski & Armstrong 2006). A Commonwealth Conservation Advice was approved in 2008 by the Federal Environment Minister under s266B of the *EPBC Act 1999* (Threatened Species Scientific Committee [TSSC] 2008).

Important habitat is managed within Kakadu and Mary River National Parks. Although both park management plans list this subspecies, among many, as in need of protection within the respective parks, specific management activities for the chats are not currently undertaken in either park (Director of National Parks 2007; Parks and Wildlife Service of the Northern Territory [PWSNT] 2011).

Capricorn subspecies

The Capricorn subspecies population is restricted to Capricornia, a small area of the central Queensland coast near the Fitzroy River. It has been recorded at 15 sites but only regularly at five locations: St Lawrence East, Herbert West, Northern Fitzroy Delta, Southern Fitzroy Delta and Torilla Plain, where it is most abundant (Garnett, Szabo & Dutson 2011). The subspecies was once believed extinct but populations are now considered to fluctuate, increasing in wetter years, and it is estimated to have an average population of around 250 mature individuals (Garnett, Szabo & Dutson 2011). Management documentation includes the national recovery plan (Houston & Melzer 2008).

Yellow Chat case study

Table 5.1: Comparison of status, threats and management actions for the Yellow Chat subspecies (Source: DSEWPaC 2013a, b; Garnett, Szabo & Dutson 2011; Houston & Melzer 2008; Houston *et al.* 2004a; Houston *et al.* 2004b; Jaensch *et al.* 2004; Woinarski & Armstrong 2006).

	Alligator Rivers Yellow Chat	Capricorn Yellow Chat
Scientific name	Epthianura crocea tunneyi	Epthianura crocea macgregori
Distribution	NT, Australia; Floodplains of the Adelaide River, Mary River, Wildman River, South and East Alligator Rivers	Qld, Australia; Curtis Island, Torilla Plain and Fitzroy River Delta
Population	< 300 adults (unconfirmed)	~250 adults
Status	International - IUCN Red List: Endangered, B2ab(ii,iii,iv,v), C2a(ii) National - <i>EPBC Act 1999:</i> Endangered NT – <i>TPWCA</i> : Endangered	International - IUCN Red List: Endangered, B2ab(i,ii,iv,v), C2a(i), D National - <i>EPBC Act 1999:</i> Critically Endangered Qld – <i>NCA 1992</i> : Endangered
Management plan	Woinarski & Armstrong 2006	Houston & Melzer 2008
Threats	 Habitat damage by grazing, feral pigs and water buffalo Saltwater intrusion and declining water quality Exotic woody weeds and invasive grasses Inappropriate fire regimes Predation by feral cats 	Habitat damage by grazing and feral pigs Invasive pasture grasses Alteration of water flows Expansion of industrial operations Wildfire

	Alligator Rivers Yellow Chat	Capricorn Yellow Chat
Conservation objectives	A viable population; evidence-based management of chat habitat	Increasing population size
Management actions	Survey populations and establish a monitoring protocol	Maintain unregulated surface flows and current drainage patterns
	Maintain grazing at levels that do not cause habitat deterioration	Maintain grazing at levels that do not cause habitat deterioration
	Manage pests, particularly feral pigs	Manage fire
	Control or eradicate invasive weeds that are affecting taxon	Manage pests, particularly feral pigs
		Consider fencing around key habitat
		Establish habitat management strategies on Curtis I.
Affected interests	KNP, including various Aboriginal Land Trusts; Mary River National Park (proposed)	Torilla Plain; Twelve Mile Creek; Raglan Creek; special, mineral & grazing leases in the Fitzroy Delta area; Curtis Island marine plain with grazing lease

5.1.2.2 Conservation investment

Because bird fauna in Australia are so well studied compared with most plant and animal groups, the state of taxonomy means it is possible to conserve Australian birds at a subspecies level. Levels of government support for subspecies conservation as a result of public pressure demonstrate the subspecies is the unit of conservation with most popular appeal (Garnett 1993). Consequently, both Yellow Chat subspecies came to prominence as taxa to be conserved because of Garnett and Crowley's (2000) systematic review of the conservation status of all subspecies of Australian birds, which was based on the taxonomy summarised in Schodde and Mason (1999).

Of the three Yellow Chat subspecies, the Alligator Rivers remains the least studied. The Capricorn subspecies has been reasonably well surveyed compared with its NT counterpart; it is endemic to the Capricorn region and a 'high priority' for conservation under the Queensland 'Back on Track' species prioritisation framework (DEHP 2013c). The Capricorn subspecies was the focus of a Birds Australia (BA) (now BirdLife Australia [BLA]) conservation project (Birds Australia [BA] 2011) and is promoted by the local group, BirdLife Capricornia, as the only endemic bird in the region. Many birdwatchers have expressed their interest in seeing the bird on the 'Birding Aus' online birdwatching forum.

Table 5.2 provides examples of major investments made in the conservation of the two case study taxa.

Table 5.2: Conservation investment for the Yellow Chat subspecies (Armstrong 2004; DEHP 2013c; Department of Environment and Resource Management [DERM] 2013; DSEWPaC 2013a, b; Houston & Melzer 2008; Woinarski & Armstrong 2006).

	Alligator Rivers Yellow Chat	Capricorn Yellow Chat
Formal recovery program	None	Informal recovery team
Expert groups	None	BLA conservation project
		Back on Track – 'high priority for conservation'
Major research	Distribution and abundance within KNP	3 major studies on incidence, ecology and rediscovery
Publications	0 species profile references (SPRAT)	29 species profile references (SPRAT)
Funding	None	\$535,150: estimated cost to implement five year recovery program
		\$22,816: Threatened Species Network Grants received (2003-2005)
Stakeholder involvement	DLRM	BLA including BirdLife Capricornia
	KNP and Mary River NP (proposed)	DEHP, state government agencies and shire councils
	Aboriginal Land Trusts	Environment Protection Agency
		Australian universities
		Pastoral leaseholders and freeholders
		Fitzroy Basin Authority (FBA) and other NRM agencies
		Defence Department
		Indigenous groups

5.1.3 Social-structural system

5.1.3.1 Social and economic considerations

The Alligator Rivers subspecies has been recorded in national parks managed by the Commonwealth (Kakadu) and NT Governments (Mary River) but neither government provides dedicated funding to manage the subspecies. In 2010, a record 23,000 people visited Shady Camp, one of the few places where the Alligator Rivers subspecies is seen regularly and a popular and nationally known recreational fishing spot in Mary River National Park. However, little is done to facilitate sightings of chats by park management (PWSNT 2011). There is no coordinated bird conservation group in the NT region although there is an online forum about birds and birding in the NT where one sighting of the taxon has been recorded in recent years.

The Capricorn subspecies' habitat occurs across a range of tenure types including freehold, leasehold (special, mineral and grazing) and protected areas (Curtis Island marine plain) (Houston & Melzer 2008). Most of the known breeding habitat at Twelve Mile Creek (Fitzroy Delta) lies within the upper extent of leasehold land used for salt extraction (Houston & Melzer 2008). Known mineral reserves here include copper, zinc and gold. Development applications that have the potential to significantly impact Capricorn subspecies habitat must be referred to DSEWPaC under the *EPBC Act 1999*. Grazing practices on freehold grazing properties and grazing lease areas in Curtis Island Conservation Park must be monitored (Houston & Melzer 2008).

Funding of recovery efforts in Qld flows mainly from the Qld government, but Central Queensland University (CQU), FBA and BirdLife Capricornia have also contributed funds (BA 2011; Fitzroy Basin Authority [FBA] 2007; Houston & Melzer 2008;). Important habitat is managed by affected interests such as staff of Curtis Island National Park, a salt refinery, pastoral landholders and grazing leaseholders, all with Capricorn subspecies habitat on their land. In addition, the birdwatching and fishing communities access some areas of habitat for recreational purposes (Houston & Melzer 2008).

5.1.4 Nature of fieldwork undertaken and primary data collected

Eleven semi-structured interviews were conducted between 14th April and 12th May 2011 with key informants identified in the stakeholder analysis (Table 5.3). The stakeholder analysis revealed more practitioners working on the Capricorn subspecies (7 interviewed) than on the Alligator Rivers subspecies (4 interviewed). Interviews were conducted with key informants representing the following: academia (2); business/industry (2); state/territory government departments (2); birdwatchers (1); environmental non-government organisations (ENGOs) (1); landholders (1); national park management agencies (1); and natural resource management agencies (1).

Table 5.3: Key informants interviewed in the Yellow Chat case study.

Case Study Taxon	Key informant identifier	Sector represented	Scale of interest	Connection to case study taxon
Alligator Rivers Yellow Chat (AR)	AR#1 Bird tour operator	Private	International	Commercial use of habitat
	AR#2 State government	State government	Regional	Governance
	AR#3 Birdwatcher	Public	International	Recreational use of habitat
	AR#4 National park	Commonwealth government	National	Management of key habitat
Capricorn Yellow Chat (C)	C#1 Academic	Scientific	National	Research on case study taxon
	C#2 Academic	Scientific	National	Research on case study taxon
	C#3 Salt producer	Private	National	Management of key habitat
	C#4 Pastoralist	Public	Local	Management of key habitat
	C#5 ENGO-birding	Community	National	Research; Recreational use of habitat
	C#6 NRM	State government	Regional	Research funding
	C#7 State government	State government	Regional	Governance

5.2 Key informant interview analyses

5.2.1 Valuational system

5.2.1.1 How do Australians value threatened birds?

5.2.1.1.1 Major influences on attitudes towards nature

All key informants described how their interest in the natural world stemmed from an early age and developed as they grew older. Some described their interest as 'innate' or not guided by anything in particular, while others identified individuals, such as family members or teachers, who played an important role in encouraging their interest. All but two either grew up in a rural environment which allowed their interest to grow through regular contact with wildlife or they regularly took part in family activities such as bushwalking and camping as children. The two who had neither of these experiences were both spurred to conservation interest by reading books depicting the detrimental impact of human activities on the natural world (e.g. Rachel Carson's 'Silent Spring' and Alan Moorehead's 'The Fatal Impact'). Nature documentaries were also important for several key informants (e.g. those presented by Britain's David Attenborough, Australia's Harry Butler 'In the Wild' series, or the American series 'Wild Kingdom').

5.2.1.1.2 Attitudes towards birds and threatened birds compared with other kinds of wildlife

Birds were described by key informants as being the most visible and accessible of all wildlife groups; they provide a relatively easy way to interact with the natural environment. Their physical beauty, variety and interesting behaviours made them particularly attractive to key informants. It followed that those with greater experience of birds said they had cultivated an interest in bird groups with more complex life histories (e.g. migratory birds) or are especially excited by rare or unusual birds.

Half of the key informants described being more interested in birds than other kinds of wildlife and these tended to be people interacting directly with birds on a regular basis. This interest was described in terms of love, fascination, familiarity and a sense of protectiveness. Most of the others considered all types of wildlife to be of equal interest, while one considered

bird life as less important than plant life. Mammals and reptiles were described by some as providing a more satisfying wildlife experience than birds, due to the added difficulty of seeing them in their natural environment, 'behaving as they should'. Overall, key informants mainly held experiential and humanistic avifaunal attitudes towards birds (Table 5.4).

Responsibility for conserving threatened birds was an evident theme amongst key informants because of their belief in these birds' integral role in complex ecosystems or their feeling of having a moral obligation to prevent species' extinctions.

An interest in birds was thought to have influenced the professional lives of all interviewees. Although one key informant described how they would like to work across a range of wildlife types, they found that opportunities to work on bird-related projects were more common; another key informant relocated his birding tour company to the NT to be situated in a 'world class birding destination'. Overall, key informants particularly held conservation, humanistic, mastery, moral and utilitarian avifaunal attitudes towards threatened birds (Table 5.4)

'Just seeing species out in their natural habitats gives me pleasure. It gives me some confidence that humanity hasn't totally lost it, and I think it's a rejuvenating and positive experience' AR #2 State government. Table 5.4: Yellow Chat key informant statements about birds and threatened birds by avifaunal attitude categories (number of statements shown in brackets where more than one similar statement made; blank cells indicate no statements were made), (n=11).

Attitude	Statements about birds	Statements about threatened birds
Aesthetic	Value their beauty (2); colourful parrots are special	
Biophysical	Interesting life histories, e.g. migration (2); took part in bird surveys	
	and netting; abundance; variety	
Conservation	Popular tool to effect change in wildlife conservation; community	If knew more about them could raise awareness with my tour groups
	involvement in bird censuses useful to other species too	
Ecological	Enjoy reading about ecological aspects; keen naturalist	
Experiential	I/people enjoy/interested in seeing/watching birds (5); visibility an	
	advantage (2); easy way to interact with environment (2); got more	
	interested via work/experiencing large numbers, abundant species;	
	been around birds all my life; got more interested due to work;	
	exciting to find little known, rare bird	
Humanistic	Fond childhood memories (2); engaging behaviour; public relate to	Gouldian Finch popular because magnificent; some think birds more
	birds more easily than other groups; got interested via girlfriend	important than anything else; threatened birds huge concern
Mastery	Field guides available; like to see new birds, add them to my list	Exciting trying to find them; tour groups want to see, I'm interested
Moral	There's a place for all of it	Should know more about threatened birds in region because of work
Symbolic	More emblematic than other wildlife	
Utilitarian	More research opportunities for birds than other wildlife	Can use them to sell my bird tours

5.2.1.1.3 Is conservation of threatened birds important to the Australian public?

When considering the public as a single entity, several key informants suggested that the broader Australian public is not interested in conservation. This was partly attributed to a widespread lack of awareness of conservation issues and a climate of self-interest where concern about conservation of other species is a low priority:

'Simply because there isn't wide community awareness... if it went extinct, there would be a local news item and everybody would go: "Oh what a shame," then just get on with their life' C#5 ENGO-birding.

The perceived challenge for conservation practitioners of communicating relevant information to the public was seen as contributing to this dilemma:

'If people knew what was going on it would be very important to them, but people don't have a clue and there's no way of telling them' C#6 NRM.

Some found it helpful to think of the public as consisting of different interest groups and in this way could see how sectors of the public could be more actively engaged in conservation, particularly on a local level. For example, it was suggested that birdwatchers, fishermen and similar groups who have an existing connection to the taxa could be encouraged to participate in various practical ways, from managing habitats to communicating with stakeholder groups. Key informants highlighted that individuals could participate through various strategies depending on their situation, for example as landholders maintaining critical habitat, urban dwellers planting bird friendly gardens, or birdwatchers creating a demand to see a particular bird. The key was to identify opportunities for awareness-raising and engagement that target specific behaviours to be changed or actions to be taken. Some admitted that certain groups may be more difficult to engage than others. For example, 'red-neck' elements of society were described as being particularly unreceptive in both the NT and QLD.

5.2.1.2 Who is involved in threatened bird conservation?

5.2.1.2.1 Who would you consider to be the key organisations involved in conservation of the case study species?

In addition to the 11 key stakeholder representatives interviewed in this study, key informants suggested a small number of other local, regional and national organisations were important, mostly for governance processes or management of key habitat (Table 5.5).

5.2.1.2.2 Who has most influence on threatened bird conservation and what are their motives for conserving threatened birds?

Overwhelmingly, birding ENGOs such as BLA or its local branches (e.g. BirdLife Capricornia), were thought to have greatest influence on conservation of threatened birds due to their potential to lobby government, engage with the community and conduct their own research. BLA was perceived as being a group of like-minded people with a love of birds and a desire to see them preserved. Part of its success was seen to derive from encouraging local ownership of threatened birds, while its campaigns were thought to give value to particular species which increases their importance to society.

The Commonwealth and state/territory governments were described as influential due to their role in policy-making and administering legislative requirements through the *EPBC Act 1999* and state/territory threatened species legislation, which can result in the development of recovery plans and funding for a listed taxon.

Groups that administer funding and research support such as CQU were also considered important, as were those who manage critical habitat such as national parks staff and landholders.

Key informants said the community can also play a role in driving demand for conservation efforts and participating in appropriate conservation activities. Table 5.5: Main organisations identified by key informants as involved in conservation of the Yellow Chat subspecies (n=11).

Case Study Taxon	Key organisation	Role
Alligator Rivers Yellow Chat	BirdLife Australia	Conservation
	DSEWPaC	Funding, governance
Capricorn Yellow Chat	Australian Defence Force Environmental Advisory Committee (Torilla Plain)	Management of feral species on ADF land
	BirdLife Capricornia	Conservation
	DSEWPaC	Funding, governance
	Local catchment group at 12 Mile Creek (Fitzroy Delta)	Habitat management
	Queensland Parks and Wildlife Service	Habitat management
	Wetlands International	Population surveys

Table 5.6: Messages communicated by Yellow Chat key informants about the importance of conserving threatened birds, by attitude category and frequency of mentions (n=11).

Attitude	Message	Key informant expressing attitude
Aesthetic	Attractive physical characteristics (e.g. appearance or song)	1 x National park manager
Conservation	Promote awareness of status and consequences of losing biodiversity	1 x Birdwatcher
Ecological	Importance of the taxa's role in an ecosystem	1 x State government; 1 x Business/Industry
	Importance of protecting the taxa's habitat or life support system	1 x Academic
Experiential	Wonder and enjoyment of the natural world	1 x Academic
Mastery	Tempting birdwatchers by exploiting rarity value	1 x National park manager
Moral	Personal responsibility through own actions	1 x Pastoralist
	Federal government responsibility through legislation	1 x ENGO-birding; 1 x Natural resource manager
Symbolic	Highlighting cultural importance to Traditional Owners	1 x National park manager

5.2.1.2.3 What messages do stakeholders communicate to the public?

When asked to describe what message they would give to the general public about the importance of conserving threatened birds, interviewees suggested a range of different strategies which were consistent with individual interests and priorities rather than with organisational goals (Table 5.6).

5.2.1.3 Do the values held for particular species of threatened birds affect the success of strategies to conserve them?

5.2.1.3.1 Which values are held for particular species of threatened birds?

How did you get involved with the case study taxon?

At the time of writing, none of the Alligator Rivers subspecies key informants had seen the bird in the wild and they implied that potential interest in the taxon rests with a handful of local individuals.

Management of the Alligator Rivers subspecies was described as being the responsibility of DLRM. However, it was said that a very small team is responsible for managing it along with around 200 other threatened species. It is perceived to be rare due to its small population and limited distribution, and since it is not known to be in crisis, it is not a priority for conservation effort. A similar situation was described in KNP where management of the main population is led by an individual with a very broad research and monitoring remit but no particular role regarding the birds. Both individuals said they are involved purely as part of their role rather than any broader personal initiative.

'It's a listed threatened species and therefore I had to address it as I have to every other threatened species' AR#2 State government.

One key informant described how his birding tour business could contribute to conservation efforts for the taxon by recording sightings and generating demand among his local, national and international tour guests, if he had more accurate information about where it could be found. Another key informant, a local birdwatcher, intimated how keen he is to add this difficult to see bird to his list of Top End sightings but also that he appreciates the symbolic role it plays in highlighting efforts required to conserve what is generally considered to be a pristine wetland landscape.
'I didn't know about Yellow Chats really until I moved to the Territory... I knew it was a bird I'd have to go to some strange places to look for... (but) I found it difficult to find information on, so my quest to see one hasn't succeeded yet' AR#3 Birdwatcher.

In contrast, most of the Capricorn subspecies key informants stated they see the bird on a regular basis or know where the birds can be sighted. One key informant explained he got involved when Birds Queensland funded QPWS to investigate the conservation status of the Curtis Island population in 2000. A second key informant said he became involved when two mainland populations were discovered at Torilla Plain and the Fitzroy Delta in 2004 and that this acted as a catalyst for much of the conservation effort on the taxon.

'(C#2 Academic) realised how accessible the 12 Mile Creek ones were and that we really had the opportunity to study a bird that was little known in the whole of Australia, in any subspecies, more easily than anyone else. It's been a famously difficult bird to access before this... I don't think I knew enough about the significance of them at the time...it was a bird I'd never seen... I devoured everything about them after we did' C#1 Academic.

Key informants mentioned that after the rediscovery, a range of opportunities resulting in several new research partnerships with individuals and organisations in the Rockhampton area subsequently presented themselves. They also pointed out that individuals can significantly influence conservation efforts. For example, in 2008 one key informant started working at a salt refinery with key Capricorn subspecies habitat and, due to a general interest in birds and of threatened bird conservation in particular, he granted permission to CQU to survey the salt pans. He explained how this decision resulted in a personal affection for the birds and an interest in their survival. Conversely, another key informant replaced a local NRM agency staff member in 2010 and, as a result of an administrative oversight, ceased annual funding to conduct population surveys and monitoring.

Another key informant who owns a property where the Torilla Plain population was discovered described how they were found during a routine wetland bird survey on his property:

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'A fellow from Brisbane was up here doing bird counts and he actually found the Yellow Chat. He asked me about them and I just said to him I'd been here all my life and I see them on a regular basis. He was kinda knocked over when I told him that and... that's how they started coming up here and counting them' C#4 Pastoralist.

Another key informant got involved with the subspecies through BirdLife Capricornia, which promotes it as the region's only endemic bird thereby creating demand among birdwatching tourists to see this iconic taxon.

What is most important to you about conservation of the case study taxon?

A greater focus on the Alligator Rivers subspecies, in the form of gathering superior biophysical and threat impact data, was recognised as most important to its conservation by key informants. The partnership between the NT Government and the Commonwealth governmentmanaged KNP was identified as a conduit, or barrier, for this flow of information. Better community engagement was also raised as important. However, this was seen by some key informants as being neither supported by the authorities, nor desired by the community:

'I know that places like Shady Camp are somewhere where birders will go to try and see the species because they want to tick another species off. To be honest, I don't see that as a big imperative: "twitchers"⁵¹. What I want to know is that the species is relatively secure and those sorts of things' AR#2 State government.

Discussion about the importance of conserving the Capricorn subspecies focused more around its inherent right to exist and society's responsibility for preventing its disappearance. Reasons given included the bird's attractive appearance, its engaging behaviour and niche role in a fascinating landscape. Protection of its habitat and management of threats were identified as key actions that could be implemented.

⁵¹ 'A birdwatcher whose main aim is to collect sightings of rare birds' (Oxford Dictionaries Online 2014b).

Do you personally believe that conservation efforts for the case study taxon will succeed or fail?

There were no conservation efforts being conducted for the Alligator Rivers subspecies at the time of the research. Population monitoring was infrequent and had not been conducted since 2004. This appeared to result in a 'false sense of security' for those working on the taxon and a concern for those who were not. Climate change was perceived as being the major unknown factor, with the potential to impact either positively or negatively on the taxon.

Opinions about the success of conservation efforts for the Capricorn subspecies were more positive. However, some of this was attributed to finding additional populations rather than the efficacy of conservation efforts. One area of major concern was identified as the ongoing preservation of suitable habitat, which was thought to be reliant in the short term on the 'precarious' support of landholders and government in the face of economic pressure, and 'at the mercy' of climate change in the longer term. It was suggested that CQU's survey and monitoring research could provide justification for key habitat protection.

Is it important to you that a population of the case study taxon exists in the wild?

Ongoing existence of a wild population of the Alligator Rivers subspecies means different things to the individuals involved, including: the important ecological function the birds play in their wetlands habitat and as an indicator of the health of that system; their intrinsic right to persist where they belong; and their psychological or other contribution to humanity.

The connection of the Capricorn subspecies to its habitat, its intrinsic right to exist and the benefit it provides to people as an interesting, unique and attractive bird were all given as reasons for preserving a wild population of this taxon.

'These species have got a huge financial benefit for the community. If we just take tourism as an example, people are prepared to spend a lot of money to go to where there are threatened species or endemic species that can't be seen anywhere else, and that kind of thing is totally ignored as compared to having a new coalmine or some other infrastructure built' C#5 ENGO-birding.

Can the local community influence conservation of the case study taxon?

Limited opportunities were identified for local communities to contribute practically to conservation of either Yellow Chat subspecies, mainly due to their restricted ranges and remote

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habitats. It was pointed out that the Alligator Rivers subspecies exists within two national parks, inhabiting areas considered inhospitable to most people. Little has been done to promote the bird to the broader community, however it was suggested that the proximity of one sub-population to an estuarine fishing spot at Shady Camp in Mary River National Park could mean that, if suitably informed, fishermen could potentially contribute by recording sightings of the birds. It was also suggested more interest could be generated among the birding community, which could play a similar role if more up to date information were available about where it could be found.

'We have definitely started awareness campaigns for threatened species, but the Yellow Chat hasn't been focused on just yet... Its environment is not (accessible), apart from a small and very enthusiastic, rabid group of fishermen, who are generally interested in something else and prepared to wear the mud and mosquitoes and the midges and the tidal rivers and the crocodiles. So, from that sense it wouldn't be the easiest of species' AR#4 National park.

The Capricorn subspecies exists mostly on private land, so the perceived conservation community involves a handful of pastoral landholders and grazing leaseholders as well as a salt refinery manager, all of whom were considered to be effectively engaged in the management strategy. It was suggested that 12 Mile Creek, an important breeding site and regular fishing spot, could be better managed by users of the area.

5.2.1.3.2 Which significant characteristics lead to a species' status as a key or iconic threatened species in terms of political decision-making, significant events and social attitudes?

The Alligator Rivers subspecies was considered by a couple of key informants as a potential mangrove and tidal area icon due to its threatened status. In contrast, the Capricorn subspecies is promoted by BirdLife Capricornia as an iconic threatened subspecies because it is the only endemic bird in the region and consequently is the only bird that birdwatchers cannot see anywhere else. It was suggested that, being iconic, people get 'hooked into it' because they want to help it.

As an example of political decision-making, one key informant described how the Qld Government's biodiversity strategy has three components, one aspect of which is to 'brand' an activity relating to conservation of the endangered and iconic Northern Hairy-nosed Wombat *Lasiorhinus krefftii*. This flagship campaign is co-sponsored by an international resource extraction company, Xstrata, and is intended to not only benefit the recovery of the wombat but to raise awareness of threatened species more generally in the Qld media. The government – industry partnership is deemed successful because it is very clearly focused on a particular project with a specified outcome which both partners have agreed upon.

5.2.1.3.3 Do you think use of flagship birds is an effective way to educate the public about broader conservation issues?

Public education was seen by key informants as being important for improving conservation outcomes and they thought promoting a flagship species as a communication tool can be a useful way of bringing attention to important issues:

'Absolutely. I think most successful awareness campaigns need something to focus on. Just to say our intertidal environment is possibly at threat from future climate change impacts would not mean much to the general public, unless we could say: "Well we could lose this cute little or pretty little critter." So I think it's an essential way of bringing attention to broader issues' AR#4 National park.

5.2.1.3.4 Would the case study taxon make a good flagship bird for your region?

Several factors were mentioned as detracting from the Alligator Rivers subspecies' potential to serve as a flagship bird, including: a lack of awareness about it, its restricted range and difficulty in encountering it in the wild. However, one key informant found support for promoting it as the face of the mangrove and tidal area of KNP to conserve the broader landscape.

On the other hand, the Capricorn subspecies is already promoted as a flagship bird by BirdLife Capricornia due to it being the only endemic bird in the region. As a result, it is known that many birdwatchers are keen to see it in the wild. Major aspects perceived to make it suitable for its flagship status include: relative accessibility, rarity, eye-catching appearance and

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typifying their marine plain wetland environment. However, limited distribution and small size make it difficult to see, and may detract from its potential.

'People get more involved with something that they think: "Because it looks beautiful, well that's worth preserving," as opposed to some little brown bird that doesn't look very attractive and they think: "Oh well, we won't worry about that one. We'll let that one go extinct"' C#5 ENGO-birding.

Overall, key informants indicated that flagship species should be chosen to have sufficient public appeal to reach the target audience, including being attractive or colourful; be able to be used to convey the complexity of its situation in simple terms; and represent an appropriate range of habitat and species. Most importantly, they thought, the communication strategy around the flagship must have clear objectives from the outset for the species and the ecosystem as well as for any sponsors supporting their promotion.

Other potential flagship bird species nominated included: Gouldian Finch *Erythrura gouldiae*, mentioned by two key informants, and the Crimson Finch *Neochmia phaeton*, mentioned by one informant.

5.2.1.3.5 Is the perception of rarity alone sufficient to influence attitudes and behaviour that lead to effective conservation action?

Among key informants, rarity was considered important for influencing attitudes and behaviour that lead to effective conservation programs and it was thought to make rare species more attractive to birdwatchers, but it was not the only driving factor. Most importantly, key informants tended to be aware of many competing rare taxa and felt a responsibility to protect all biota. An example of this is the Alligator Rivers subspecies which was listed because its population was perceived to be declining but was perceived by some key informants to be rare due to its small population and limited distribution, hence was not a priority for conservation. Other important factors mentioned include: physical beauty, fascinating behaviour and an unusual name. 5.2.1.3.6 Which characteristics of rare species are important to their conservation?

Key informants made many spontaneous references to characteristics of rarity when discussing conservation efforts for the Yellow Chats (Figure 5.1), as exemplified by this key informant's comment about isolated populations:

'It's an interesting species with regard to its disconnection from the nominate subspecies and its isolation over a long period of time. There is some speculation that it may well have evolved into a separate species by now and there were some plans to take some DNA and have that analysed to see if that proved to be the case' C#5 ENGO-birding.



Figure 5.1: Characteristics of rarity mentioned by Yellow Chat key informants, shown according to their corresponding attitude category.

5.2.1.3.7 Summary of values held for the Yellow Chat subspecies

Attitudes expressed by key informants during their interviews about the Alligator Rivers and

Capricorn Yellow Chats are summarised and compared in Table 5.7.

Table 5.7: Summary and comparison of attitudes expressed by key informants during their interviews about the Yellow Chat subspecies, according to the avifaunal attitude categories (ticks indicate attitudes expressed), (n=11).

	Alligator Rivers	Capricorn
Attitudes		
Aesthetic		\checkmark
Biophysical		\checkmark
Conservation	\checkmark	\checkmark
Ecological	\checkmark	\checkmark
Experiential		\checkmark
Humanistic		\checkmark
Mastery	\checkmark	\checkmark
Moral	\checkmark	\checkmark
Negative		
Spiritual		
Symbolic		\checkmark
Utilitarian		

5.3 Conclusions

Clearly the two case study taxa existed in very different human social contexts, as indicated by the difference in types of attitudes expressed about them. Very few people were known to have seen the Alligator Rivers subspecies in the wild, not even those who manage it, hence a 'vicious circle' effect appeared to be in play whereby little experience with the taxon contributed to its ongoing obscurity. Conversely, as a consequence of opportunities for key informants to engage directly with the Capricorn subspecies and the resulting bank of knowledge, affection and support, this subspecies was valued more highly and more diversely across a broader cross-section of society than the Alligator Rivers. It therefore appeared better placed to receive support, and thus persist, in the face of future conservation challenges. **CHAPTER 6: Migratory Parrot Case Study**



Image 6.1: Orange-bellied Parrots *Neophema chrysogaster* in a captive breeding facility, Taroona, Tasmania. Credit G. Ainsworth.



Image 6.2: Swift Parrot *Lathamus discolor* feeding in native vegetation. Credit C. Tzaros.

This case study focuses on two species of Australian migratory parrot: the Orange-bellied Parrot *Neophema chrysogaster* (OBP) (Image 6.1) and the Swift Parrot *Lathamus discolor* (Image 6.2). The species are broadly similar to each other in appearance and biology and both are listed as threatened under Commonwealth and state/territory legislation. This chapter explores the attitudes held by key stakeholders towards these two parrot species and investigates whether attitudes are correlated with achieving conservation outcomes. A summary of key differences between the two species is provided in Appendix 6.

6.1 Desktop analysis and nature of the fieldwork undertaken

6.1.1 Biophysical system

6.1.1.1 Biology and ecology

Orange-bellied Parrot

The OBP is a small, migratory, seed-eating, 'grass parrot'. Adults weigh 45-50g and are around 21cm in length. They have bright green upper body parts and light green to bright yellow underbodies with an orange patch on their belly and wings edged with royal blue (DSEWPaC 2013c). The species is endemic to south-eastern Australia including Tasmania. Formerly, its mainland range extended along the coast from Adelaide, east through South Australia and coastal Victoria and north to near Sydney in New South Wales. Now, they are rarely recorded from west of the Murray River in South Australia or east of Jack Smith Lake in South Gippsland (Orange-bellied Parrot Recovery Team [OBPRT] 2006a). Their current breeding range is a narrow coastal strip of southwest Tasmania and most breeding occurs within 20km of Melaleuca, a remote settlement protected within the Tasmanian Wilderness World Heritage Area (OBPRT 2006a). They are thought to use diverse habitats including buttongrass plains, eucalypt forest (breeding range), saltmarshes, coastal dunes, pastures, estuaries, islands, and moorlands, usually within 10km of the coast (OBPRT 2006a). During the Australian winter they migrate to the mainland and a key factor affecting population dispersion is thought to be availability of food in saltmarshes in mid-winter (OBPRT 2006a). Research into the ecology of the species has led to the detailed mapping of plant communities across their range (OBPRT 2006a).

Swift Parrot

The Swift Parrot is a small, fast-flying, nectarivorous, migratory parrot in the genus Lathamus (DSEWPaC 2013d; Saunders et al. 2010). The parrots are mostly bright green in colour, with dark blue patches on the crown, a prominent red face and the chin and throat are narrowly bordered with yellow (DSEWPaC 2013d). Adults weigh about 65g and are approximately 25cm in length with a wingspan of 32-36cm. They are sometimes confused with lorikeet species but can be distinguished by their call, slimmer build and distinctly long, pointed tail (DSEWPaC 2013d). The Swift Parrot breeds in Tasmania and migrates to mainland Australia in the Australian autumn where it disperses across a broad landscape to forage in eucalypt forests. On the mainland they occur mostly in Victoria and New South Wales although small numbers are recorded in the ACT, SA and southern Qld (Saunders et al. 2010). The breeding season coincides with the flowering of Tasmanian Blue Gum Eucalyptus globulus and its nectar is their main source of food at this time. Black Gum E. ovata is also widely used as a food source for recent arrivals from the mainland (Saunders et al. 2010). The distribution and occurrence of breeding and nesting habitat can be very patchy across the landscape due to major wildfires and land-use activities that have destroyed natural habitat over the last two centuries. In addition, flowering of food plants occurs on an irregular basis with the result that, in many years, the majority of the breeding population may be concentrated within, and dependent upon, a limited area where both nesting and food resources are available (Saunders et al. 2010).

6.1.2 Institutional/regulatory system

6.1.2.1 Conservation status and governance

A summary of distribution, population, status, threats, conservation objectives, management actions, conservation investment and affected parties for both parrots is provided below (Table 6.1).

Orange-bellied Parrot

The OBP is protected throughout its range by state and Commonwealth governments. It is listed as 'Critically Endangered' under the *EPBC Act 1999*, and 'Endangered' or 'Threatened' under threatened species legislation in NSW, SA, Tas., and Vic. (Table 6.1). It was generally considered widely common until the 1920s, when anecdotal observations of many thousands of

birds were recorded (OBPRT 2006a). Initial concerns for the species' plight were voiced in 1917 and its abundance has apparently declined steadily ever since (OBPRT 2006a). It was originally identified as at risk by a team of researchers representing birdwatchers, industry and a range of state government conservation agencies, which was commissioned by ICI (Australia) Pty Ltd to investigate potential impacts of an industrial development on a critical part of its habitat (OBPRT 1998). A number of major threats have been identified (OBPRT 2012; Garnett, Szabo & Dutson 2011), including:

- fragmentation and degradation of over-wintering habitat by drainage, grazing, agriculture or urban development;
- inappropriate fire regimes in the breeding range;
- stochastic factors such as disease, loss of genetic variation, storms during migration and destruction of nest sites, eggs and chicks by wildfire;
- introduced predators (e.g. fox Vulpes vulpes and cat Felis catus);
- competition for food and nest sites (e.g. European Goldfinch Carduelis carduelis and Sugar Glider Petaurus breviceps);
- Psittacine Circoviral Disease; and
- potential collision with wind farm turbines in Tas., western Vic. and south-eastern SA.

The OBP is currently one of Australia's most threatened species. The population declined sharply between 2008 and 2010 and is now estimated at less than 50 individuals in the wild (OBPRT 2012; Weston *et al.* 2012). Only one breeding population is known to exist although some birds are known to spend summer beyond the Melaleuca observation area, where there could be others (OBPRT 2012). Population models suggest extinction in the wild by 2015 (BLA 2013b; Martin *et al.* 2012; OBPRT 2010). A captive breeding program was established in 1986 and, as of July 2012, around 205 birds were held in facilities at Taroona (Tas.), Healesville Sanctuary, Melbourne Zoo, Hall's Gap Zoo and Moonlit Sanctuary (Vic.), Adelaide Zoo (SA) and Priam Parrot Breeding Centre (NSW). The target is to reach 350 birds by 2016/17 (OBPRT 2006a, 2013). The recovery team is currently developing a Translocation Strategy to guide future decision-making for the captive breeding program (OBPRT 2012), including the management of Psittacine Beak and Feather Disease (PBFD) in captive-breed and wild OBPs (OBPRT 2013).

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Conservation of the OBP is managed under the 'National recovery plan for the Orangebellied Parrot (*Neophema chrysogaster*)' (OBPRT 2006a). The plan is implemented by the Orange-bellied Parrot Recovery Team (OBPRT) which was established in 1983, consequently having the longest running formal recovery program in Australian history (Martin *et al.* 2012; Weston *et al.* 2012). A new recovery plan has been developed and is currently undergoing a process of consultation and endorsement by the relevant governments (OBPRT 2012).

At the time of fieldwork, the OBPRT comprised the following 17 representatives, as well as a number of informal members: Department of Primary Industries, Parks, Water and Environment – Tasmania (DPIPWE) (2 including Chair); BLA (2); Department of Environment, Water and Natural Resources – South Australia (DEWNR) (1); Department of Sustainability and Environment - Victoria (DSE) (3); Department of Sustainability, Environment, Water, Population and Communities – Commonwealth (DSEWPaC) (1); Latrobe University (1); Zoos Victoria (1); and six regional volunteer coordinators.

Swift Parrot

The Swift Parrot is also protected throughout its range by state and Commonwealth governments. It is listed as 'Endangered' under the *EPBC Act 1999* and 'Vulnerable' or 'Endangered' under threatened species legislation in the ACT, NSW, Qld, SA, Tas. and Vic. (Table 6.1). The total population of Swift Parrots is estimated to be 'at best stable' at no more than 1,000 breeding pairs (Saunders & Tzaros 2011; Saunders *et al.* 2010). Its decline, which was first recorded in 1917, is considered likely to continue given the continued mortality of birds and ongoing loss of habitat (Saunders & Tzaros 2011). Major threats to the species include (Garnett, Szabo & Dutson 2011; Saunders & Tzaros 2011):

- loss and alteration of foraging and nesting habitat through forestry activities, including firewood harvesting, residential and industrial development, agricultural tree senescence and dieback, regeneration suppression and frequent fire;
- loss of nesting and foraging habitat from climate change;
- collision mortality (wire netting, mesh fences, windows and cars);
- competition for food and nesting resources from introduced and invasive species;
- PBFD; and

• illegal wildlife capture and trading.

Conservation of the Swift Parrot is managed under the 'National Recovery Plan for the Swift Parrot *Lathamus discolor*' (Saunders & Tzaros 2011). At the time of fieldwork, the Swift Parrot Recovery Team (SPRT) comprised 12 representatives from the following organisations: Australian National University (1 representative); BLA (Chair); DPIPWE (3); DSE (1); DSEWPaC (1); Office of Environment and Heritage – NSW (OEH) (1); Tasmanian Conservation Trust (TCT) (1); and three corresponding members from: DEWNR-SA; Department of Environment and Heritage Protection – Qld (DEHP); and Department of Environment and Sustainable Development - ACT (ESD).

Migratory Parrot case study

Table 6.1: Comparison of status, threats and management actions for the Migratory Parrot species (Source: BLA 2013b, c; Caldwell 2006; DSEWPaC 2013c, d; Garnett, Szabo & Dutson 2011; OBPRT 2006a; Saunders & Tzaros 2011; Saunders *et al.* 2010).

	Orange-Bellied Parrot	Swift Parrot
Scientific name	Neophema chrysogaster	Lathamus discolor
Distribution	NSW (possibly); SA; Tas.; Vic.	NSW/ACT; Qld; SA; Tas.; Vic.
	Breed in Tasmania in summer in a mosaic of eucalypt forest, rainforest and moorland and sedge plains, then migrate in winter to the mainland to feed on coastal saltmarshes and grassy/weedy pastures or dune systems	Breed in Tasmania in summer in Blue Gum and Black Gum forests, then migrate to mainland Australia in autumn where they disperse in winter to feed in a range of eucalypt habitats
Population	200 - 250 (includes captive population)	2,000 (excludes captive birds)
Status	International - <i>IUCN Red List</i> : 'Critically Endangered A2abc+3bc+4abc, B1ab(I,ii,iii,iv,v), C1+2a(I,ii),D,E' National – <i>EPBC Act 1999</i> : 'Critically Endangered' NSW - <i>Threatened Species Conservation Act 1995</i> : 'Endangered' SA - <i>National Parks and Wildlife Act 1972</i> : 'Endangered' Tas <i>Threatened Species Protection Act 1995</i> : 'Endangered' Vic <i>Flora and Fauna Guarantee Act 1988</i> : 'Threatened'	International - <i>IUCN Red List</i> : 'Endangered C2a(ii)' National - <i>EPBC Act 1999</i> : 'Endangered' ACT – Nature Conservation Act 1980: 'Vulnerable' NSW - <i>Threatened Species Conservation Act 1995</i> : 'Endangered' Qld - <i>Nature Conservation Act 1992</i> : 'Endangered' SA - <i>National Parks and Wildlife Act 1972</i> : 'Endangered' Tas <i>Threatened Species Protection Act 1995</i> : 'Endangered' Vic <i>Flora and Fauna Guarantee Act 1988</i> : 'Endangered'
Management plan	OBPRT 2006a	Saunders & Tzaros 2011
Threats	Inappropriate fire regime at breeding habitat Degradation and loss of non-breeding habitat Invasive weeds Introduced predators and competitors	Loss and alteration of foraging and nesting habitat Climate change impacts Competition for foraging and nesting resources Mortality from collisions with human-made objects
	wind energy developments	DISEase

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	Orange-Bellied Parrot	Swift Parrot
	Disease	Illegal bird capture and trade
	Illuminated boats and structures	Introduced predators
	Trapping	
Conservation	Monitor population size, productivity, survival and life history	Prevent further decline of population
objectives	Identify all sites used and better understand migration	Achieve demonstrable sustained improvement in quality and
	Increase carrying capacity of habitat by actively managing sites throughout range	quantity of habitat to increase carrying capacity
	Identify, measure and ameliorate threats, particularly in migratory and winter habitats	
	Increase number of breeding sub-populations/groups	
	Maintain a viable captive population	
Management	Protection and restoration of key non-breeding habitat:	Identify extent and quality of habitat
actions	Placement and management of wind farms	Manage and protect habitat at the landscape scale
	Estuary management	Monitor and manage impact of collisions, competition and disease
	Decommissioning and land use of Melbourne Water's Western Treatment Plant	Monitor population and habitat
		Increase community involvement in, and awareness of, the
	Removal of stock / modification of grazing practices	recovery program
	Effective reduction of predators and competitors	Coordinate, review and report on recovery process
	Better understanding and management of toxic food plants / herbicides	
	Effective control of recreational activities at key sites	
	Effective implementation of Commonwealth and state government legislation	
	Within breeding range:	
	Successful implementation of prescribed burning	

	Orange-Bellied Parrot	Swift Parrot
	Effective reduction of introduced predators and competitors	
	Effective control of visitor and development activities	
	Careful management of founder stock to support captive breeding program	
Affected interests	Government: Commonwealth, state, territory	Government: Commonwealth, state, territory, local
	Conservation and land management agencies	Agricultural land managers
	Indigenous people	Community organisations
	Mining and other natural resource extraction	Conservation land managers
	NRM organisations	Indigenous people
	Tourism	NGOs
		NRM organisations
		Universities
		Urban, rural residential and industrial developers

6.1.2.2 Conservation investment

Table 6.2 provides examples of major investments made in the conservation of the two case study taxa.

Orange-bellied Parrot

The OBP's recovery team is a multi-agency, multi-government recovery team including members from universities and non-government organisations. Several founding members are still directly involved today and their combined knowledge and experience of the species, together with landholders, researchers and volunteers, is considered to be a major strength of recovery efforts (Martin *et al.* 2012). Unusually, the recovery team also has a dedicated Recovery Program Coordinator, appointed for the life of the current recovery plan to manage the plan's coordination (Martin *et al.* 2012; OBPRT 2006a). The recovery plan also explicitly acknowledges the importance of the recovery team and includes actions aimed at increasing recovery effectiveness (Martin *et al.* 2012).

In 1986, a captive breeding program was commenced to: act as a safeguard against catastrophic decline of the wild population; augment the wild population through reintroductions; and provide opportunities for research and public education (OBPRT 1998; Smales *et al.* 2000). The reintroduction to the wild of 264 captive-bred birds between 1994 and 2006 failed to re-establish a viable wild population at a formerly abandoned site and in March 2010 it became evident that the species would be extinct in the wild within three to five years unless drastic action was taken (Martin *et al.* 2012). The recovery team responded quickly and 21 wild juveniles were taken into captivity in the 2010-2011 breeding season to 'increase genetic diversity and enhance the possibility of future conservation options, including population augmentation and reintroduction once threats are managed' (Martin *et al.* 2012, p.4).

Swift Parrot

The Swift Parrot is a flagship for the BLA 'Woodland Birds for Biodiversity' project, along with the Regent Honeyeater Anthochaera phrygia. As a flagship, recovery efforts for the Swift Parrot

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are anticipated to also benefit at least 38 other threatened woodland birds, 18 endangered ecological communities and numerous threatened plant species (BLA 2013c).

The plight of the Swift Parrot was brought to national attention when it became the focus of then Australian Greens Senator Bob Brown's controversial court case to prevent Forestry Tasmania (which has statutory responsibility to manage Tasmania's state forest) from logging in Wielangta forest (Austin & Douglas 2008). In 2006, the Federal Court found that Forestry Tasmania's Regional Forest Agreement (RFA) was damaging to the natural habitat of the Swift Parrot and two other threatened species (the Tasmanian Wedge-tailed Eagle *Aquila audax fleayi* and the Wielangta [Broad-toothed] Stag Beetle *Lissotes latidens*). Logging was halted, but instead of changing industry practices to meet the law, the law was changed to describe practices in place at the time. In 2007, then Prime Minister John Howard and Tasmania's state Premier, Paul Lennon, changed the RFA and 'undermined' the court's finding (Austin & Douglas 2008) by agreeing that Forestry Tasmania's management plan did protect endangered species and ultimately this made logging exempt from the provisions of the *EPBC Act 1999*. The court case confirmed that RFAs and the *EPBC Act 1999* were ineffectual for protecting wildlife (Austin & Douglas 2008).

Table 6.2: Conservation investment for the Migratory Parrot species (Caldwell 2006; DSEWPaC 2013c, d; OBPRT 2006a, 2010, 2013; Saunders & Tzaros 2011).

	Orange-Bellied Parrot	Swift Parrot
Formal recovery	Orange-bellied Parrot Recovery Team	Swift Parrot Recovery Team
program	1984 to date	1998 to date
Major projects	BLA Orange-bellied Parrot Recovery Project	BLA Woodland Birds for Biodiversity Project
	3 community conservation and recovery projects (SPRAT)	18 community conservation and recovery projects (SPRAT)
Publications	104 species profile references (SPRAT)	53 species profile references (SPRAT)
	OBPRT newsletter 'Trumped Up Corella' (1999 to date)	BLA 'The Wing Thing – Woodland Birds'
Funding	\$4,365,100: 5 year recovery program	\$4,822,352: 5 year recovery program
	\$41,073: Threatened Species Network Grants (2005 – 2009)	\$365,357: Threatened Species Network Grants (2002 – 2009)
	>\$5m: Australian, Tas., Vic. governments (1996 – 2006)	
	Wildcare Save the Orange-bellied Parrot Fund	
Stakeholder	Government: Commonwealth, state	Government: Commonwealth, state, territory, local
involvement	Australian universities	Agricultural land managers
	Conservation and land management agencies	Conservation and land management agencies
	Indigenous people	Indigenous people
	Mining and other natural resource extraction	NRM organisations
	NRM organisations	Non-government and community organisations
	Non-government and community organisations	Urban, rural residential and industrial developers
	Tourism	Volunteers
	Volunteers	

6.1.3 Social-structural system

6.1.3.1 Social and economic considerations

Orange-bellied Parrot

Recovery efforts for the OBP were initially slow to gain momentum. The species' plight was recognised as early as 1965 but the first actions taken to conserve it did not happen until 1978 when an ICI (Australia) Pty Ltd proposal to construct a petrochemical plant threatened one of its main over-wintering refuge sites (OBPRT 2006b). The first two recovery plans targeted habitat protection for the species across its range, particularly from industrial development projects, and establishment of a captive breeding and release program (OBPRT 2006b) but implementation of recovery actions was ad hoc until a formal, costed strategy was proposed in 1991. The 1998-2002 plan continued in the same vein, but increased community engagement through the establishment of regional working groups to assist with recovery program tasks and increased awareness of the OBP and degradation of its coastal habitat (OBPRT 2006b).

A major focus of the current (2006) OBP recovery program has been to engage the community through public information and education programs. As a result, considerable social capital for the species has been identified in the form of school sponsorship of nest-boxes, tertiary and postgraduate studies, community-based habitat restoration programs and a high level of volunteer participation in annual survey and monitoring programs across its mainland range (OBPRT 2006a; Weston *et al.* 2012). Economic benefits include tourism ventures providing guided tours to the OBP observatory at Birch's Inlet in the Tasmanian World Heritage Area and businesses associated with implementation of the recovery program. Economic risks are associated with wind energy developments in Tasmania and southern Victoria, which coincide with the parrot's migratory and winter range, and habitat disturbance from cattle stocking practices (OBPRT 2006a).

Importantly, the OBP has a high, and often negative, profile in relation to land-use planning (Weston *et al.* 2012). For example, it was famously called a 'trumped-up corella'⁵² by the then

⁵² Corella species are considered a pest in many agricultural areas. Mr Kennett provided approval to use 'trumped-up corella' as the name of the recovery program's newsletter soon after this project was abandoned (OBPRT 2006b).

Valuing birds

Victorian premier Jeff Kennett when he wanted to move the Coode Island chemical storage facility to one of its most crucial wintering grounds at Point Lillias in 1994; although the parrot was blamed, the project was shelved for financial reasons (Dooley 2008; OBPRT 2006b; Starks & Holdsworth 1999). Former Federal Environment Minister Ian Campbell controversially 'back-flipped' with his decision to block the Bald Hills wind farm in Victoria, apparently because of its potential impact on the OBP's survival. However, given an imminent state election at the time of the decision, the change has been attributed to a bid for votes (Caldwell 2006; Dooley 2008; Topsfield 2006). In 2012, the parrot was again cited by the Victorian Environment Department as a reason for referring a development to the *EPBC Act 1999*, this time for the Yaringa Boat Harbour expansion, despite the birds not having been recorded in the area since 1987 (Maher 2012). A combination of notoriety and the significant amounts of Australian and tax-payer's money invested in the conservation of this 'pampered parrot' (Caldwell 2006; Dooley 2008; Hudson 2010) mean it is sometimes the brunt of humour (e.g. Inkcinct 2006).

Swift Parrot

The Swift Parrot is a charismatic species which is used as a flagship for the broad-scale conservation of woodlands to benefit a multitude of additional threatened and declining birds and ecological communities (BLA 2013c). Recovery efforts are reliant on identification of known and potential habitat and a large network of around 1,000 community volunteers who currently participate in annual surveys across its mainland range (Saunders & Tzaros 2011; Saunders *et al.* 2010). Volunteers also conduct habitat restoration programs and attend educational workshops. Involvement in these activities is described as providing social benefits to community spirit and pride whilst gaining enjoyment and appreciation of their natural environment' (Saunders & Tzaros 2011, p.36). Economic impacts are associated with preventing or restricting activities which may result in the loss or degradation of habitat across a range of tenure types (Saunders & Tzaros 2011).

The Swift Parrot's situation with regard to land-use planning differs significantly from that of the OBP. The Swift Parrot has been identified as the most commonly cited species for referral under the *EPBC Act 1999*, with 57 referrals up to 2009. However, none of the 57 referred

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projects was rejected and nine required no approval as long as they were conducted in a particular manner, while Ministerial approval was required for the remainder (Allchin, Kirkpatrick & Kriwoken 2013).

6.1.4 Nature of fieldwork undertaken and interviews conducted

Thirty-two semi-structured, qualitative interviews were conducted between 2nd August and 21st September 2011 with key informants identified in the stakeholder analysis (Section 3.4.3.2). Fifteen interviews were conducted with experts on OBPs and twelve with experts on Swift Parrots. Three interviews were conducted with experts on both species (Table 6.3). As a result of institutional and jurisdictional arrangements, the majority of stakeholders were based in Canberra (ACT), Hobart (Tas.) and Melbourne (Vic.) and face to face interviews were conducted in these locations. During fieldwork it was also possible to visit an OBP captive breeding facility and Swift Parrot habitat to gain a better understanding of the case study context.

Interviews were conducted with key informants representing the following: Commonwealth and state/territory government departments (10 stakeholders); ENGOs (6); business/industry (3); academia (2); consultants (2); landholders (2); media (2); volunteers (2); aviculture (1); catchment management agencies (1); and scientific organisations (1).

Taxon	Key informant identifier	Sector represented	Scale of interest	Connection to case study taxon
Orange-bellied	OBP#1 Landholder	Public	Local	Management of key habitat
Parrot	OBP#2 Consultant	Private	Regional	Research on taxon; Member: OBPRT
	OBP#3 Volunteer	Public	Local	Research on taxon; Member: OBPRT
	OBP#4 CMA	State government	Regional	Research funding
	OBP#5 State government	State government	Regional	Governance; Member: OBPRT
	OBP#6 State government	State government	Regional	Governance; Member: OBPRT, SPRT
	OBP#7 Museum/zoo/breeding	Scientific	National	Research on taxon; Member: OBPRT
(OBP#8 Academic	Scientific	National	Research on taxon; Member: OBPRT
	OBP#9 State government	State government	Regional	Governance; Member: OBPRT
	OBP#10 State government	State government	Regional	Governance; Member: OBPRT
	OBP#11 State government	State government	Regional	Governance
	OBP#12 ENGO-birding	Community	National	Advocacy for taxon
	OBP#13 Media	Private	Regional	Publicity for taxa
	OBP#14 Industry	Private	International	Commercial use of habitat
	OBP#15 Industry	Private	International	Commercial use of habitat
	OBP#16 ENGO-birding	Community	National	Advocacy for taxon
	OBP#17 ENGO-birding	Community	National	Advocacy for taxon

Table 6.3: Key informants interviewed in the Migratory Parrot case study.

Taxon	Key informant identifier	Sector represented	Scale of interest	Connection to case study taxon
Swift Parrot	SP#1 Industry	Private	International	Commercial use of habitat
	SP#2 ENGO-birding	Community	National	Advocacy for taxon; Member: SPRT
	SP#3 Academic	Scientific	National	Research on taxon; Member: SPRT
	SP#4 Volunteer	Public	Local	Advocacy for taxon
	SP#5 Volunteer	Public	Local	Advocacy for taxon
	SP#6 Museum/zoo/breeding	Scientific	Regional	Research on taxon
	SP#7 Consultant	Private	Regional	Research on taxon
	SP#8 State government	State government	Regional	Governance; Member: SPRT
	SP#9 State government	State government	Regional	Governance; Member: SPRT
	SP#10 State government	State government	Regional	Governance; Member: SPRT
	SP#11 ENGO	Community	National	Advocacy for taxon; Member: SPRT
	SP#12 ENGO	Community	National	Advocacy for taxon
Orange-bellied	OBP-SP#1 Media	Private	Regional	Publicity for taxon
Parrot and	OBP-SP#2 State government	State government	Regional	Governance; Member: OBPRT
Swift Parrot	OBP-SP#3 Cwlth government	Commonwealth	National	Governance; Member: OBPRT, SPRT
		government		

Migratory Parrot case study

*Note: 'OBP' = Orange-bellied Parrot; 'SP' = Swift Parrot. OBPRT = OBP Recovery Team; SPRT = Swift Parrot Recovery Team.

6.2 Key informant interview analyses

6.2.1 Valuational system

6.2.1.1 How do Australians value threatened birds?

6.2.1.1.1 Major influences on attitudes towards nature

All key informants described having a strong interest in the natural world and alluded to nature as a significant part of their identity. For most, this connection developed at a very young age and was nurtured by a key family member who either regularly took them on nature-based activities such as camping, bushwalking, fishing and birdwatching, or encouraged them to explore their own interests through caring for native animals (e.g. aviary birds) or studying the natural world around them. Television documentaries (e.g. those presented by Britain's David Attenborough or Australia's Harry Butler) sometimes supplemented their growing passion while books such as Douglas Adams' 'Last Chance to See' and Rachel Carson's 'Silent Spring' prompted a desire in some to work in a conservation related field. Other major influences included mentors, university degree programs, interest groups such as naturalist and birding groups, or nature-based fieldwork. Several key informants grew up in a rural setting and continue to enjoy a rural lifestyle.

'As a child I spent an enormous amount of time with my grandfather who had a great love of nature... he used to take me fishing and mushrooming and yabbying out in the bush and that's where I got my love of it... Then I had a teacher in high school who taught us environmental science and... that (was when) I started to think about how the thing that I loved was in serious danger from all these factors...' SP#9 State government.

6.2.1.1.2 Attitudes towards birds and threatened birds compared with other kinds of wildlife

Key informants said that birds offer them a ready way to enjoy the natural world, whether in the city, out bushwalking or when conducting scientific fieldwork. Birds were described as an 'obvious' and 'vital' part of the landscape that anyone can see. Many described birds in emotional terms, explaining that birdwatching is a relaxing and pleasurable experience, and for some provided a 'sanity saver' or 'sense of place'. The variety of species, their ubiquitousness, diurnal habits and fascinating behaviour (e.g. migration) were all mentioned as contributing to the popularity of studying birds, both as a hobby and for research purposes. Consequently, key informants found there were more opportunities to work on bird-related projects than any other wildlife group. Although several key informants said they started out with a passion for another wildlife group (e.g. mammals), direct experience with birds has resulted in an appreciation for their unique place in the natural world and an understanding of why humans relate to them so well.

When asked to consider their attitudes towards threatened birds, most key informants described their involvement in either emotional or moral terms, e.g. 'passion', 'privilege' or 'responsibility'. Given their strong connection to nature through birds, many would feel sad or make it a personal duty to avoid extinction of a species because of the perceived loss to society:

'Although I try and use science to prevent extinctions, my reasons for doing that are not really scientific, it's an emotional thing' OBP#9 State government.

One key informant was critical of the 'military triage' approach to conservation because of its reliance on diagnosis and treatment of symptoms rather than taking a precautionary approach. Table 6.4: Migratory Parrot key informant statements about birds and threatened birds by avifaunal attitude categories (number of statements shown in brackets where more than one similar statement made; blank cells indicate no statements were made), (n=32).

Attitude	Statements about birds	Statements about threatened birds
Aesthetic	Being colourful is advantage (3); appreciate their beauty (2); beautiful when they fly; being beautiful is advantage; some species powerful	
Biophysical	Variety of species (2); good research animals; diurnal; variety of physical characteristics	Interested in breeding; biophysical similarity between species may help identify how to improve status; whole working life devoted to studying birds; interested in science and gaining knowledge on birds
Conservation	Birds are a key group to communicate conservation messages	Protecting bird habitat can protect habitat for many species; birds got me interested in conservation; must try but rational part of me says probability of conserving species very low
Ecological	Good research animals	Loss of any element from ecosystem weakens the whole ecosystem
Experiential	Visible (6), easier to detect than other wildlife (3); audible; always surprising and engaging to see what turns up; appeal to people who like to see/hear them in the wild; plenty of other people to get excited about birds with; vital/obvious part of landscape/ecosystem; most people engage with birds in some way; important part of people's experience of the world	Enjoy seeing a variety of species
Humanistic	Engaging behaviours (3); people very passionate about birds (2); awe inspiring; envy how they fly; fond childhood memories; connection with nature; charismatic; many people have aviary birds; like having birds around; important to sense of place	I get upset about loss of species, declines, extinctions; feel empathy because they are in trouble; many special species on threatened species list; try to use science to prevent extinctions but it's an emotional thing; planet's poorer for every species lost; shame to lose something if we haven't put enough effort into saving it; once it's gone every generation has lost something; my reasons vary depending on my mood from self-interest at a genetic level to a selfish superficial perspective

Migratory	Parrot	case	stud	У
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Mastery	Best known group of wildlife in Australia	Threatened birds attract your attention more; looking for rarity, different, most scarce
Moral		Should be part of landscape in perpetuity; nothing should go extinct; if I don't do anything can't expect anyone else to; not on my watch; I have a statutory responsibility to protect threatened bird species; I want to 'fight the good fight' and keep them here for future generations; people will look back and say 'I'm never going to get to see that thing' so that drives me to work in conservation; Australia has a poor track record for extinctions; we have a responsibility to look after the biodiversity of the planet; want to keep them for future generations because of intrinsic value
Symbolic	Majestic; freedom to move around	
Utilitarian		Need to act now to avoid pouring money into terminal projects (like the OBP); makes us think about whether to give up on species because they're not a good investment anymore; don't think we can ever get away from self-interest in nature and what we choose to conserve

6.2.1.1.3 Is conservation of threatened birds important to the Australian public?

The majority of key informants felt that conservation of threatened birds is important to a small section of Australian society, such as active birdwatchers or those already engaged in resource management activities. One key informant pointed to the proliferation of nature-based documentaries, magazines and news stories in the Australian media as an indication of society's growing interest in the natural world.

Some said most Australians would not necessarily want to see a species go extinct, however conservation would not 'rate very highly on their scale of things that are important' (*SP#12 ENGO*). Many reasons for a perceived lack of concern were given, for example:

- little awareness or understanding of key conservation issues;
- the media's role in influencing how people think about conservation;
- poor public profile of the conservation movement as groups of activists; and
- emphasis of conservation legislation on listing threatened species rather than curbing damaging processes.

Key informants suggested some solutions to these problems, most of which revolved around changing societal attitudes. It was generally felt that if the broader community could see the value in conserving biodiversity this could lead to them providing decision-makers with the political power to follow through on conservation action. It was suggested that personalising conservation by bringing it into people's sphere of consciousness and better 'marketing' of conservation activities (i.e. through distributing more positive conservation messages) would enlist greater public support.

6.2.1.2 Who is involved in threatened bird conservation?

6.2.1.2.1 Who would you consider to be the key organisations involved in conservation of the case study species?

When asked to consider which organisations contribute most to conservation of the case study taxa, key informants suggested a range of organisations for both species in addition to those on the recovery teams (Table 6.5). 6.2.1.2.2 Who has most influence on threatened bird conservation and what are their motives for conserving threatened birds?

Overall, government was nominated most frequently as having greatest influence on conservation of threatened birds. State and Commonwealth government agencies in particular were considered most influential because of their statutory and legislative responsibility to manage the environment. Additionally, the Commonwealth government was said to provide funding and recovery planning support to state agencies when the *EPBC Act 1999* is triggered. Local councils were thought to sometimes negatively impact on conservation through inappropriate planning processes. Politicians were said to make influential decisions about funding and legislation and it was suggested that a powerful politician at a national level could significantly contribute to threatened bird conservation, or divert conservation efforts in an inappropriate way:

"Campbell's Cash" was a good example of that because he (Environment Minister Ian Campbell) just decided he was going to give \$300,000 to King Island and we were saying: "But they don't need it, there's more of a priority over here" OBP#6 State government.

In the non-government sector, BLA was identified as a well-respected, high profile, effective lobby group with the ability to provide critical data for some species when needed. Their large, conservation-oriented membership was thought to influence policy as well as contribute to community projects. Other influential groups mentioned included field naturalist clubs and those managing habitat restoration programs.

Case study taxon	Key organisation	Role
Orange-bellied	State government (DPIPWE, DSE)	Governance
Parrot	BirdLife Australia	Advocacy
	Adelaide Zoo, Healesville Sanctuary and Taroona	Captive breeding
	Melbourne Water Werribee Treatment Plant	Management of key habitat
	Parks Victoria	Management of key habitat
	Environment Protection Agency	Governance
	Local government	Planning decisions
	Community groups (e.g. birdwatching, restoration, field naturalist groups)	Voluntary conservation programs
	Scientific experts/academics	Research and advice
Swift Parrot	BirdLife Australia / BirdLife Tasmania	Advocacy
	Industry partners (e.g. Forestry Tasmania)	Mitigation of threats
	Scientific experts/academics	Research and advice
	State government (DPIPWE, DSE)	Governance
	Environment Tasmania	Coordinate Tasmanian environment groups
	Tasmanian Conservation Trust	Advocacy (especially on private land)
	Local government	Planning decisions/clearing applications
	Community groups (e.g. field naturalist and 'Friends of' groups)	Community engagement
	Private landholders	Protection of habitat

Table 6.5: Main organisations identified b	v ke	informants as involved in conservation	n of the Migrator	v Parrot speci	es (n=32).
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Table 6.6: Messages communicated by Migratory Parrot key informants about the importance of conserving threatened birds, by attitude category and frequency of mentions (n=32).

Attitude	Message	Key informant expressing attitude
Aesthetic	Beauty of taxon	1 x ENGO
Biophysical	All species fascinating in own right	1 x Scientific
	Uniqueness of taxon	1 x ENGO; 1 x State government
Conservation	Conservation of threatened birds is possible	1 x ENGO-birding; 1 x State government
	Importance of individual action	1 x Consultant; 1 x ENGO; 1 x ENGO-birding; 1 x Scientific; 2 x State government;
		1 x Volunteer
	Importance of protecting habitat	2 x ENGO; 1 x Volunteer
	Importance of saving taxon	1 x Academic; 1 x Media
	Need for financial support	1 x Industry; 1 x State government
	Threats to focal taxon, birds in general	1 x ENGO; 2 x State government
Ecological	Birds are indicators of environmental health	1 x Commonwealth government; 1 x ENGO-birding
	Importance of role in ecosystem	2 x Academic; 1 x Consultant; 1 x Industry; 2 x Scientific; 2 x State government; 1
		x Volunteer
Experiential	Wonder and enjoyment of natural world	1 x Academic; 2 x State government
	World would be poorer to humans without diversity	1 x Consultant; 1 x Scientific; 1 x State government
Humanistic	Contribution of birds to 'sense of place'	1 x State government
Moral	Duty to preserve species for future generations	1 x Consultant; 1 x Landholder
	Obligation to share key resources with other species	1 x CMA
	Responsibility to care for other species	2 x ENGO-birding; 1 x Industry; 1 x Scientific; 2 x State government
Utilitarian	Benefit of conservation to human life	1 x Academic; 2 x ENGO-birding; 1 x Scientific; 1 x State government; 1 x
		Volunteer

Individuals representing the scientific and private sectors (e.g. developers and resource extractors) were also described as being influential, particularly if they have close connections with decision-makers. Members of the public were said to influence conservation through habitat conservation on private land, by lobbying the government or joining community groups.

Several key informants pointed out that developers, particularly of wind farms, can have a negative impact on biodiversity, despite claiming to be members of a clean, green industry.

6.2.1.2.3 Do the motivations people hold for conserving particular threatened birds affect the success of conservation strategies for them?

OBP key informants were fairly consistent in their views that personal motivations can affect the success of conservation strategies. One key informant summed up a range of sentiments:

'There are divergent views and fundamental philosophical differences in what people believe should be done... Disputes are part of the game' OBP-SP#3 Cwlth government.

Some key informants were critical of recovery efforts and pointed to three major periods in the recovery team's history where philosophical differences led to decisions that significantly influenced conservation efforts:

1. Purpose of captive population

Some members of the team were said to have lost sight of the original objective of the captive population, which was to act as an insurance policy for the species, not to supplement the wild population. Failing to address factors limiting the wild population meant that continual release of birds 'muddied the waters', gave a false sense of security in terms of how the wild population was faring and took up too much of the recovery funding and effort over the years.

2. Releasing captive birds to supplement the wild population

Once it was realised the captive population did not have sufficient genetic diversity for long-term survival and adaptation in the wild, team members said they were faced with the decision to take 'founder birds' from the wild to maintain genetic health and integrity of the captive birds, while simultaneously reducing the numbers of birds in the wild and therefore diminishing the wild population's capacity to survive. There were disagreements over
whether this was the right course of action, however it was said a 'comfortable majority' made a risk management decision and voted to ensure the existence of a long-term viable population, even if it must remain in captivity.

3. Conservation funding

Key informants said the source of funding and how funding may be expended had significantly influenced the direction of recovery efforts in spite of the recovery team's advice (e.g. "Campbell's Cash"):

'At the moment the (government) agencies are very, very much focused on making sure they bolster the captive population so it doesn't go extinct during their term. Whereas I think other people on the recovery team and in that space are really concerned about it staying in the wild. So the motivations are different and it's driving a tension between how we see how the recovery program should be implemented' OBP#12ENGO-birding.

Swift Parrot key informants were less cohesive in their thoughts about whether motivations can affect conservation strategies. Examples included:

- groups using the Swift Parrot for pro-development or pro-conservation purposes;
- groups behaving in a territorial way and trying to prevent others from working on a species;
- people are more likely to succeed if strongly motivated because they will keep trying to achieve their goal (e.g. Bob Brown's Wielangta court case);
- well-constructed, convincing arguments can hold a lot of sway in terms of public comments on conservation; and
- scientists must provide rational evidence for conservation actions when deep down they have emotional reasons for wanting to preserve their species or ecosystem.

6.2.1.2.4 What messages do stakeholders communicate to the public?

When asked to describe what message they would give to the general public about the importance of conserving threatened birds, key informants suggested a range of different strategies which were consistent with individual interests and priorities rather than with organisational goals. Most messages combined a mix of reasons and examples of statements are shown in Table 6.6.

6.2.1.3 Do the values held for particular threatened birds affect the success of strategies to conserve them?

6.2.1.3.1 Which values are held for particular species of threatened birds?

How did you get involved with the case study taxon?

Just one key informant acknowledged that his interest in the OBP was purely a requirement of his job. The remainder of OBP key informants recalled the main catalyst for getting involved with the species as an opportunity to work on its conservation, which either presented itself as part of an existing role or as a new position. Several key informants had been working on the species for a decade or longer. A third of OBP key informants chose to defend the species because of its entanglement in controversial circumstances. Given the species' rarity and the remoteness of its habitat, few had experienced the bird in the wild prior to formally working with it, so getting the chance to observe it made their job all the more attractive. One key informant, who was not a recovery team member but who has a strong personal connection to the birds, was critical of the recovery effort and described how his involvement became more serious as his concern for their plight grew:

'Over the last 20 years I've been involved with surveys of them... as a kind of punter we were still reassured that everything was fine. But then in the last five years I got more involved in the recovery efforts and more involved with people studying them. I realised that these birds weren't just somewhere else. The reason that we were seeing less birds was that there were less birds to see. So that's where my concern for them increased... trying to get to the bottom of that and dispel some myths...' OBP#13 Media.

The OBP's fidelity to specific sites and connection to wilderness areas such as Melaleuca in Tasmania and the coastal saltmarshes in Victoria added significantly to the experience of studying these birds in the wild and were described as hidden incentives to stay involved with them over several decades.

Swift Parrot interviewees got involved with the species via diverse routes. Some took on management of the species as part of their existing threatened species conservation work,

while others were motivated by the 'unacceptable' level of habitat destruction in Tasmania by commercial logging operations. A handful of key informants chose to get involved by virtue of a personal encounter with the birds, for example:

'The big surprise I had was seeing them in the cities... One spring I went shopping and there were Swift Parrots in a (flowering) gum, right in the Woolworth's car park. I hadn't seen them before and I thought: "Wow! This is amazing!' OBP-SP#1 Media.

What is most important to you about conservation of the case study taxon?

Most key informants working on the OBP mentioned actions that could help preserve the wild population, such as ensuring population surveys continue to deliver data about responses to changing environmental conditions and understanding the causes of population decline. The team was criticised by some key informants for having placed too strong an emphasis on winter habitat as the limiting factor on the species' survival rather than on breeding habitat. In particular, the lack of fire in the last 10 years was thought to have contributed to the demise of the breeding population.

The captive breeding program was described as an important 'safety net' to avoid losing the species completely, however continued financial support was considered essential for it to grow and perform better. The longevity of the recovery team and members' depth of species knowledge were considered to lend authority to management decisions within DPIPWE and DSE.

A handful of key informants were mindful of the economic investment in recovery efforts over the decades, saying this challenged society's values around when to 'give up' on a species, required the public to understand the value of what is being lost and compelled team members to use valuable lessons learned along the way to best advantage.

Several key informants strongly criticised the Commonwealth and state governments for negatively influencing recovery efforts. One key informant was particularly disparaging about government restrictions placed on how funding provided by government could be allocated:

'Diagnosing the proximate threats is just so important. And the fact that so much government money's put into on-ground works: the millions of dollars, "Campbell's Cash" and stuff that was put into the recovery of the species. All

people say is we've spent so much money on this species, but not very much of it was spent on research to diagnose what caused (the population decline). So we probably would have known about these declines 5 years ago if we'd been able to put those scientists on to do it then rather than have to do it as part of an adjunct to their day job' OBP#12 ENGO-birding.

Several key informants disapproved of the way local government managed OBP habitat in western Victoria, including a regimen whereby saltmarsh feeding areas were inundated and damaged by deliberate release of floodwaters from the Yambuk Lake and a proposal to build a wind farm development in the parrots' flight path.

One key informant was especially bitter about his experiences with government at all levels:

'I've just completely lost interest (in the OBP) now. The government wasn't very supportive at all in regards to conservation of the parrots... you're basically on your own. Once the government agencies got involved I think it went downhill. I've had regrets even telling them (catchment management agencies) I've seen these birds because everyone wanted a piece of them. I think a lot of the times they were used to get whatever funding or whatever it may be that different agencies wanted' OBP#1 Landholder.

Swift Parrot key informants faced a different set of conservation challenges and tended to focus more on protection of critical habitat across the species' range. Some referred to the difficulties of managing the species and its habitat due to its complex natural history and because its requirements change each year depending on weather and other circumstances.

'I think we need to focus more on preservation of foraging resources. Both nesting habitat and foraging habitat are critical, but we can be more strategic about management of nesting habitat, whereas because of the variability of flowering in the foraging habitat from year to year I think we need to ensure we maintain as much as we can across the range' SP#1 Industry.

A significant difficulty was a perceived lack of trust between two key Tasmanian stakeholders:

'There are a lot of good people working within the Department of Environment (DPIPWE) on understanding this bird and advocating on its behalf. It would be unfair to say no one's doing anything effective but the

effective outcome that we need to see is habitat protection and none of that is being delivered yet' SP#12 ENGO.

'What really lost me with them (a national ENGO) was just seeing how they operated with this forestry deal. It's nothing about biodiversity conservation from my perspective... I guess we all sort of sat around for quite a while thinking that they might come and ask us some questions and they never did... partly because there's this suspicion of the Tasmanian government' SP#8 State government.

The species' physical characteristics were also described as advantageous, making it emblematic for a range of species that are less obvious or interesting to the public. A handful of key informants described feeling an ethical responsibility to preserve the parrots, partly for future generations to experience and to avoid them suffering the same fate as the OBPs, but also because the birds have an intrinsic right to exist. Because of successful efforts by Tasmanian aviculturists to breed these parrots in captivity, diverse bloodlines were said to exist in case a captive breeding program is required.

Do you personally believe that conservation efforts for the case study taxon will succeed or fail?

Orange-bellied Parrot

On the whole, key informants were cautiously optimistic about the OBP's chances of survival. Most attributed this to the captive bred 'insurance' population which is intended to be released into the wild in the near future, however success was thought to be contingent upon genetic viability of this population and surmounting the challenges of reintroduction.

Opinions were divided about survival of the wild population and even those who were optimistic gave it low odds. They highlighted the significant amount of work being conducted by recovery team members, volunteers and the community to learn more about supporting the birds in the wild and encouraging them to breed, to provide habitat for birds should they 'rebound', and maintaining a positive attitude about continued investment in conservation effort.

Those who were pessimistic pointed to a range of factors, including:

 evidence of an extinction vortex taking place leaving the very small population in a highly vulnerable position;

- lack of understanding about the causes and rate of population decline and an inadequate response to its decline;
- whether the wild population will continue to breed sufficiently to maintain a viable population;
- whether captive bred birds can be released soon enough to supplement the existing wild population; and
- whether captive bred birds will instinctively navigate existing migration routes if there are no wild birds to lead them.

'If we're measuring success as (a) focal effort to bring people together to undertake some conservation activities that have social benefits and flow on conservation benefits then it will have successes. There is a chance that it will succeed and we're obliged to try by legislation so that's why we're trying. But it seems a dire situation and I would be surprised if we succeed in biological terms for the species in the long term' OBP-SP#3 Cwlth government.

When asked to consider what it would mean to them if conservation efforts were to succeed, key informants responded with strong emotions such as: 'enormous relief', 'very satisfied', 'extremely happy' and 'fantastic'. They would feel the considerable amount of effort and money expended on the species was justified, that the recovery team had done a good job in the face of great difficulties and that a very special and beautiful species was not being lost. Those who foresaw failure anticipated feeling 'devastated', 'very saddened', 'grief', 'anger' and 'disappointment'. Again, key informants attributed these emotions to the considerable investment in the species. For several, failure would indicate that efforts had not been invested in a timely or appropriate way:

'It's very, very sad on many levels, the loss of a lovely species, but I think it could be coloured by irritation, verging on anger, that a bunch of people responsible for looking after the recovery have failed so miserably and spent so much money in failing' OBP#15 Industry.

For others it would exemplify the difficulties inherent in the conservation triage approach:

'I'd be really very saddened to think that as a community we didn't see this coming, which we should have, and then invest appropriately well before.

We're always reactive... it makes you realise what sort of funds are required for conservation and we are not doing it for other species so it makes you think other species are on the same path on the longer term' OBP#4 CMA.

Only one key informant, whose interest in the OBP was purely a requirement of his job, thought the parrot's extinction would go unnoticed by the broader community:

'...because they're small, they are parrots and a parrot looks like a parrot to a layman' OBP#14 Industry.

Swift Parrot

Swift Parrot key informants seemed uncertain about its long-term survival. On the one hand, the population was said to appear stable, conservation efforts were considered to be on a positive trajectory and improved forest management practices in Tasmania were described in positive terms. On the other hand, many variables affecting the species' habitat were discussed, including a large number of stakeholders with competing objectives as well as the impacts of climate change and commercial logging, leaving several key informants with a sense of doubt about, and perceived lack of control over, the chances of conservation success. This was partly due to an implicit sense of separation between those working on either side of the Bass Strait. For example, some key informants working to protect Tasmanian forests from logging perceived mainland logging activities as the most significant threat, and vice versa. Local politics in Tasmania were also seen to hamper efforts to conserve the Swift Parrot somewhat. One key informant was highly critical of the Tasmanian government's attitude towards captive breeding of Swift Parrots by local aviculturists, despite those aviculturists developing significant knowledge about the species:

'We cracked the husbandry of the Swift Parrot to the extent that they dropped from about \$3,000 a pair to... about \$120 each. Once we did that basically there was no real demand for wild caught Swift Parrots... but we certainly got no thanks from Wildlife (DPIPWE)' SP#6 Museum/zoo/breeding.

Because of the parrots' unpredictable foraging behaviour and reliance on sporadic annual flowering events, some feared that crucial potential habitat will be cleared before it can be

regulated. Opinions were divided over whether the current Tasmanian 'peace deal' would deliver positive outcomes for the parrots because of its focus on public rather than private land, where many threats remain, and its emphasis on implementing a reserve system rather than managing the landscape.

When asked to consider what it would mean to them if conservation efforts were to succeed, key informant responses varied between feeling great satisfaction and pride at having personally contributed to the success, and the knowledge that co-dependent species would ultimately benefit from protection of the parrots' habitat across a vast range. Thoughts of failure generated moral outrage but also pragmatism:

'...a most appalling tragedy... a failure of state and federal government'SP#7 Consultant.

'I'd be very, very upset, but it is a practicality. If you're going to be in this business and working on a thousand species you will inevitably see at some point in time an extinction, and you've just got to shrug your shoulders and say: "Well, ok we had a go." Things will happen that are beyond your or anybody else's control' SP#9 State government.

Is it important to you that a population of the case study taxon exists in the wild?

From the OBP recovery team's perspective, existence of a viable wild population is the ultimate measure of success hence all efforts were focused on achieving this outcome. There was also a feeling of obligation to preserve the wild population because of its heritage value and its value to future generations. Several key informants raised concerns that loss of the species would have unknown consequences for the ecosystems it inhabits, while others pointed to the species' intrinsic value and uniqueness. A handful of key informants thought that seeing the parrots in the wild was enormously important, partly because the birds have introduced many people to a beautiful saltmarsh environment that they might otherwise never have visited, and partly because a bird that only exists in captivity is little more than a 'museum piece'.

'Absolutely. Why? I think if they only exist in captivity it's a really serious sign of how we have failed, not just conservationists but the human population generally, in looking after our biodiversity assets. I think there's a much, much, much bigger picture of species loss, species decline' OBP-SP#2 State government. Swift Parrot key informants described the experience of seeing and hearing the birds in the wild in emotional terms. Some would feel sad not to be able to encounter wild birds, while others strongly connected with the places Swift Parrots inhabit. A handful of key informants focused on the birds' intrinsic right to exist, and capacity to sustain themselves in the wild. A couple of others described their opposition to seeing this species caged, although aviculturists were not immune to their loss from the wild either:

'Every time the birds migrate, they stop off in (my friend's) aviaries. As they come through he holds the phone out the window and says: "The boys are back again. You've gotta listen to this!" A couple of times when they haven't dropped in he's said: "It's been really sad this year, the birds haven't dropped in to have a chat to mine on the way up or the way down," and he sort of misses it. So, I think anybody that's used to the noise and things they make would consider it a terrible state of affairs that they're disappearing' SP#6 Museum/zoo/breeding.

Maintaining a wild population was also described in light of available resources and knowledge:

'The recovery team has always actively avoided (captive breeding) because as soon as you set up a breeding program all your resources are used to manage that... I discovered that people know how to breed these birds very successfully... so we can with relative confidence work on keeping this bird alive in the wild instead of focusing on captivity' SP#3 Academic.

Can the local community influence conservation of the case study taxon?

Key informants were generally very positive about the role the community can play in influencing conservation of both the OBP and the Swift Parrot, although for both species it was suggested that more could be done in terms of people joining local community groups and participating in community action.

Two main actions were identified that could result in immediate benefit to both species:

 volunteer participation in population distribution surveys, which is vital for providing current data on population size and habitat use and adds weight to arguments for conserving key habitat sites; and landowners protecting habitat on private land and small communities looking after their local patch, although more attractive incentive programs are required where land is considered too expensive to set aside for conservation.

On a broader scale, it was said that the public could contribute to protection of threatened species by lobbying politicians:

'The amount of community interest means that there has been pressure to keep funding (the OBP). If it was a less well-known species it wouldn't have got the support that was needed, either from federal government money or state government agencies' OBP#12 ENGO-birding.

Communicating through the media or writing to companies with the potential to impact on species habitat were also suggested as powerful strategies for community action:

'Our core business isn't looking after wildlife. But if you have a community group saying: "You're an organisation and you've got money and you can look after it better than other people and we want you to look after that site," it does have an effect' OBP#15 Industry.

Community groups acting together were thought to present a stronger voice and be better able to implement more strategic conservation actions than those working in isolation. Longer term projects, such as community tree planting and habitat revegetation, were also mentioned as important activities, although this needs to be conducted on a massive geographic scale in the case of the Swift Parrot. Finally, maintaining a positive community attitude and keeping the species in the public eye (e.g. local businesses sponsoring the species) were also mentioned as important.

However, the community can also negatively influence conservation efforts:

'Two or three years ago we had some significant money provided by the Commonwealth, what we call "Campbell's Cash", to get himself out of a bit of a political bind over wind farms and \$300,000 odd was provided to conservation of Orange-bellied Parrots on King Island. It had to be around feral cat management... there was a political decision to give money to King Island... (but) virtually the whole thing was overridden by the politics and the local community's anger over... some suggestion to close off some beaches

and they saw that as a threat to their livelihoods... effectively the whole thing was watered down by that pressure' OBP#6 State government.

Does one of the case study taxa receive more in terms of conservation investment than the other?

Key informants agreed that the OBP has received far greater financial and conservation investment than the Swift Parrot. Major reasons focused around the stronger and longer level of community effort for OBPs which was thought to have been driven by the following:

- the opportunity to observe them in Melaleuca is a hidden driver for many mainlanders working on them;
- numerous champions have consistently worked on the species and directed conservation activities;
- the species shows fidelity to certain wilderness sites creating a special connection to place for many people;
- because they are unique and difficult to encounter, people feel they are seeing something unusual and very special; and
- the 'thrill of the hunt' is greater than for Swift Parrots because OBPs are more cryptic, difficult to distinguish from other *Neophema* species and getting a close sighting is challenging.

Key informants said that social interest in the birds has also driven investment, for example:

- OBPs have had a high profile in some decision-making events under statutory planning issues which has generated some investments;
- because parts of its range are discrete, issues have been concentrated into small areas which polarised views about them; and
- people care about the species and its struggle.

Recovery team members justified the perceived large investment in OBPs, by explaining that the money has also contributed to conservation of an entire ecosystem and that if it had not gone to the parrots, it would not have been enough to conserve any other species or group of species in the region. The following statement exemplifies how several key informants described conservation investment in Australia: 'I think Australian politics and the economy is underfunding conservation tremendously. We're nowhere near the mark what we should be putting into it and that's the fundamental problem' OBP#6 State government.

However, some felt quite strongly that not all the funds had been wisely allocated or acquitted. A handful of key informants referred to "Campbell's Cash" which they said was awarded as a result of 'political fallout'. Also, they said the OBP's high media profile gave the public the impression that a lot of money was being inappropriately invested in a 'pampered parrot' on the verge of extinction.

'We actually often joke about it saying how much money we're spending on preserving this habitat: "Well, when it all works and there are flocks of OBPs coming over, it'll be worth it." But at the moment we're protecting quite large areas for very, very few birds' OBP#15 Industry.

6.2.1.3.2 Which significant characteristics lead to a species' status as a key or iconic threatened species in terms of political decision-making, significant events and social attitudes?

Both OBPs and Swift Parrots were described by a handful of key informants as iconic because they draw attention to their particular habitats and other species that use the same habitat.

OBPs were suggested as being particularly important from a tourism perspective because they are part of the diversity and uniqueness of Tasmania, which people will fly to Melaleuca to see.

Swift Parrots were said to be symbolic of old growth Blue Gum forests due to their need for large nest hollows in these trees. The parrots make a 'good story' and are used by one key informant to convey broader messages about habitat protection. People 'either love them or hate them' (OBP-SP#1 Media) because they impact on people's lives in one way or another (e.g. through the forestry debate or because the birds must be considered in suburban planning proposals). One ENGO 'iconised' the Swift Parrot as a particularly special and threatened species by referring to it in media or other communications about protection of old growth forests. They had also made a human-sized Swift Parrot costume to be worn at public events to 'bring it into people's sphere of consciousness' (SP#12 ENGO).

'They're the longest migrating parrot in the world. They're the fastest flying parrot in the world. These are the sorts of things kids can get their heads around. They're sort of record breakers in those categories. Swift parrots come to you: they come to the primary school; to your house if you live in the right spot; to your supermarket car park. They're the parrot for the people really' SP#2 ENGO-birding.

Other iconic species mentioned spontaneously by key informants included the extinct Tasmanian Tiger⁵³ *Thylacinus cynocephalus*, the Koala *Phascolarctos cinereus*, Tasmanian Devil *Sarcophilus harrisii*, Southern Cassowary *Casuarius casuarius* and Gouldian Finch.

Characteristics contributing to iconic status were identified as: charisma, colour, size, voice, location, and sympathy for the species' plight. One key informant mentioned that the NSW Office of Environment and Heritage has a separate category for iconic species within its conservation protocols, which they said describes them as having 'important social or cultural values to the community', being 'well-loved' and 'well-studied.' Previous community investment in the species was also considered a key factor.

6.2.1.3.3 Do you think use of flagship birds is an effective way to educate the public about broader conservation issues?

Overall, key informants agreed that using flagship threatened birds is an effective way to educate the public and that education is necessary to improve conservation outcomes. Several key informants said people connected readily with colourful and charismatic species which can be used as a mechanism for broadening investment and political support. However, to be effective they thought the flagship must be able to be used to highlight broader issues around conservation of habitat and species that share the same habitat because there is a need to move public sentiment beyond individual animals:

'I think the public even in a fairly wealthy and well educated country like Australia has a very superficial understanding of biodiversity conservation. So, there's a tendency to think that conservation is about saving the OBP or even saving individual animals that have been hit by a car or something, rather than

⁵³ Declared extinct by the IUCN Conservation Monitoring Centre in 1986 (McKnight 2008).

conserving communities of flora and fauna, which is what our real target is' OBP#9 State government.

6.2.1.3.4 Would the case study taxon make a good flagship bird for your region?

The effort to conserve the OBP was described by many key informants as having contributed significantly to the conservation of threatened and under-represented coastal saltmarsh habitats, drawing attention to rare plants and birds which were otherwise of little interest to society, and for this reason it was considered to make a good flagship for these particular plant communities. They said the OBP has several physical characteristics which are desirable in a flagship, including: charisma, beauty, rarity, being of concern to communities across a number of states and having an interesting life history. The species also has a high public profile which can be used to gain further attention for conservation efforts, however some cautioned that those seeking to subvert conservation activities could use its previous 'bad press' against it.

The Swift Parrot was considered by many to be a good flagship for a number of threatened ecological communities and co-dependent threatened species across its vast range. Its unpredictable habitat requirements were thought to be a good example of why a holistic approach to conservation is important since a large and wide range of habitats need to be protected to ensure its survival. The species was described as physically engaging and easy for the public to relate to, being charismatic, brightly coloured, pretty, obvious in the landscape, and fairly readily encountered across several Australian states. Its migratory nature was also described as advantageous since people become excited about the concept of migration, the parrots catch the public eye across the country and their unpredictability adds to their appeal. Swift Parrots also have a relatively high profile after being a major focus of the Wielangta court case.

'The Swift Parrot is also a good flagship species from a climate perspective because it's so dependent on climate variables which are really changeable within and between years... and because it's a migrant it demonstrates that on an annual basis' SP#3 Academic.

Other potential flagship bird species nominated by key informants included: two waders, the Hooded Plover *Thinornis rubricollis*, and the Plains-wanderer *Pedionomus torquatus*, which is

already considered a successful local flagship for Victoria's northern plains grasslands (Johnstone 2011); Malleefowl *Leipoa ocellata*; Masked Owl *Tyto novaehollandiae*; Wedge-tailed Eagle *Aquila audax*; Forty-spotted Pardalote *Pardalotus quadragintus*; and the Beautiful Firetail *Stagonopleura bella*, as well as woodland birds in general.

6.2.1.3.5 Is the perception of rarity alone sufficient to drive attitudes and behaviour that lead to effective conservation action?

Many more allusions to rarity were made about the OBP than the Swift Parrot and on the whole rarity was viewed positively in some respects. The OBP's recent rapid population decline and critically small numbers were factors raised by many key informants as incentives for personal or institutional involvement with OBPs because of the sense of urgency inherent in the species' plight.

'I feel quite honoured to be looking after a site... we've got three birds down there at the moment... and to be able to say to people: "That's 6% of the entire world's population," is quite something' OBP#15 Industry.

Doubts about the genetic viability of the wild and captive populations created uncertainty for the species' chances for survival but this 'knife-edge' situation was said to lend it more importance to some key informants than other threatened species and engendered a sense of duty to carry on. Some described great satisfaction at being in a position to contribute to knowledge about such a rare species as well as excitement at being involved:

'...when you have a really rare bird on your doorstep like that, globally rare, it's a very unusual and very exciting situation' OBP#11 State government.

However, this was tinged with feelings of regret at not having acted sooner:

'The population is in an extinction vortex so a whole heap of complex factors are happening and I guess we've left it very late to diagnose the decline. I just don't think we've addressed it fast enough or well enough' OBP#12 ENGO-birding.

Key informants mentioned that rarity can lead to community interest too. The species was described as 'on the brink' which several suggested made it easier to generate funding and

community support. In fact, key informants said that a large number of community groups had been established to carry out conservation activities for the OBP across coastal Victoria (e.g. population monitoring and revegetation programs) however, challenges abounded with maintaining interest in a species that was so difficult for volunteers to see for themselves.

Rarity can also highlight challenges associated with 'expert knowledge':

'I have a property near Yambuk and I'd seen small grass parrots down there in the past... it turns out they were OBPs. It was a long process, no one believed they were until I took a lot of photos of them and sent some data to Birds Australia. They were doing things that normally all the literature said they wouldn't do... so it took a while before anyone came to identify them. It was a little bit of disbelief I suppose' OBP#1 Landholder.

6.2.1.3.6 Which characteristics of rare species are important to their conservation?

Key informants made many spontaneous references to characteristics of rarity when discussing conservation efforts for threatened birds. The characteristics described as important to their conservation, and their corresponding attitude categories, are shown in Figure 6.1.



Migratory Parrot case study

Figure 6.1: Characteristics of rarity mentioned by Migratory Parrot key informants, shown according to their corresponding attitude category.

6.2.1.3.7 Summary of values held for the Migratory Parrot species

The attitudes expressed by key informants during their interviews about the OBP and Swift

Parrot are summarised and compared in Table 6.7.

Table 6.7: Summary and comparison of attitudes expressed by key informants during their interviews about the Migratory Parrot species, according to the avifaunal attitude categories (ticks indicate attitudes expressed), (n=32).

	OBP	Swift
Attitudes		
Aesthetic	\checkmark	\checkmark
Biophysical	\checkmark	\checkmark
Conservation	\checkmark	\checkmark
Ecological	\checkmark	\checkmark
Experiential	\checkmark	\checkmark
Humanistic	\checkmark	\checkmark
Mastery	\checkmark	\checkmark
Moral	\checkmark	\checkmark
Negative	\checkmark	\checkmark
Spiritual		
Symbolic	\checkmark	\checkmark
Utilitarian	\checkmark	\checkmark

6.3 Conclusions

The OBP and Swift Parrot exist in very different human social contexts. Although similar types of attitudes were expressed for both taxa, values held for the Swift Parrot are more diverse and more positive than for the OBP. This is positively correlated with the diversity of stakeholder involvement with Swift Parrots and is undoubtedly a key factor in their chance for long-term survival.

OBP recovery team members were relatively consistent in their attitudes towards the OBP's conservation giving the impression they are 'on the same page'. Consequently, some risky decisions have been made and valuable lessons learned which will inform conservation of other species facing similarly dire circumstances. Nevertheless, some key informants were critical of the emphasis that recovery efforts have placed on the captive bred population rather than addressing the causes of recent decline in the wild; the latter might have secured freedom for the wild birds instead of guaranteeing the species' persistence in captivity. Government and

non-government stakeholders held different motivations for how the recovery program should be implemented and this was a source of significant tension. Indeed, the government agencies were heavily criticised by some for their role in hampering OBP conservation efforts.

The fate of the parrot in the wild may now be entirely dependent upon reintroduction of captive bred birds. A major key to successful reintroduction will be society's willingness to preserve suitable environment on the mainland. However, because parts of its range are discrete, some management issues have been concentrated into small areas which polarises views about the parrot and this has resulted in some sectors of the community holding strong negative attitudes towards it. Social capital, especially the amount of funds bestowed on OBP conservation, is a seemingly constant thorn in the recovery team's side and the level of investment in this one species challenges society's attitudes around appropriate funding of conservation and the value of a single species.

Management of the Swift Parrot is conducted on two main stages. On the mainland it stars as a powerful, charismatic flagship for conservation of woodland biodiversity throughout five jurisdictions. Across the Bass Strait it has a supporting role in the decades' long conflict over Tasmania's iconic old growth forests, where ongoing lack of trust between the state government conservation agency and an ENGO is evident and appears to hamper recovery efforts somewhat. Consequently, recovery efforts are constrained by jurisdictional priorities and some local efforts are heavily politicised. The over-arching strategy is complex and a perceived lack of control over management outcomes persists. Overall, the Swift Parrot population is perceived to be stable and conservation efforts on a positive trajectory. However, its complex natural history and management requirements make its survival in the wild uncertain.

There is strong social interest in the Swift Parrot due to it being readily encountered in both urban and rural settings across a broad geographic area and it engenders affection and a strong connection to place among those who encounter it. There is significant potential for community involvement in its recovery efforts which are heavily reliant on a large number of volunteers who conduct on-ground activities throughout its range. It is considered a more suitable flagship species than the OBP and is also considered a key or iconic species.

CHAPTER 7: White-tailed Black-cockatoo Case Study



Image 7.1: Male Baudin's Black-cockatoo *Calyptorhynchus baudinii* perched in native vegetation, Bunbury, Western Australia. Credit: T. Kirkby.



Image 7.2: Public information sign raising awareness about Carnaby's Blackcockatoos *C. latirostris*, Narrogin, Western Australia Credit: G. Ainsworth.

This case study focuses on two species of White-tailed Black-cockatoo: Baudin's Blackcockatoo *Calyptorhynchus baudinii* (Baudin's) (Image 7.1) and Carnaby's Black-cockatoo *C. latirostris* (Carnaby's) (Image 7.2). Both occur in South-West Western Australia and are similar in appearance, biology and ecology. Both species are listed as threatened under Commonwealth and state legislation. This chapter explores the attitudes held by key stakeholders towards these species and investigates whether attitudes are influential in achieving conservation outcomes. A summary of key differences between the two species is provided in Appendix 7.

7.1 Desktop analysis and nature of the fieldwork undertaken

7.1.1 Biophysical system

7.1.1.1 Biology and ecology

Baudin's and Carnaby's are two of five species of cockatoos of the endemic genus *Calyptorhynchus*. Both species are endemic to South-West Western Australia (WA). Their ranges overlap and the taxa sometimes associate with each other when feeding (Department of Environment and Conservation [DEC] 2012a). They are very similar in appearance, both being brownish-black in colour, with rounded whitish patches on the ear coverts and white panels in the tail. Males of both species have a black bill and reddish-pink eye-ring while females have a whitish-grey bill and grey eye-ring. Both taxa measure 50-58 cm in length, with a wingspan of approximately 110 cm and weigh 560-790 g (DSEWPaC 2013e, f). They differ in their calls and breeding and feeding behaviour (Chapman 2008). For details of the cockatoos' ecology see Table 7.1.

Due to their similar appearance it can be difficult to distinguish between the two taxa and they are commonly mistaken for a single species in the field. Their most distinguishing feature is differentiation in the upper mandible size, and when seen close up it is possible to tell the species apart (Saunders 1979). However, many published accounts have not differentiated between the two species, and there has been a tendency for research efforts to focus on Carnaby's rather than Baudin's (DSEWPaC 2013e, f). Consequently, detailed information on the current distribution and habitat critical to Baudin's survival is only known in general terms (Chapman 2008).

Correct identification of Baudin's and Carnaby's has always been problematic. The first Baudin's specimen was collected on an expedition to the South Seas commanded by French commander Captain Thomas Baudin between 1800 and 1804. However the type specimen is thought to have been lost and when the ornithological illustrator, Edward Lear, described it in 1832, it was generally believed that both taxa were the same species (Saunders 1979). Serventy and Whittell accepted the two subspecies in 1967 (Serventy & Whittell 1967, cited in Saunders 1979).

In the late 1960s, Saunders, on behalf of CSIRO⁵⁴, began to study the White-tailed Blackcockatoo more closely because the bird was considered a pest in pine plantations and in apple and pear orchards in the South-West of WA. For this reason a number of biological and ecological studies of the two taxa were conducted which eventually resulted in their being considered two full species (Saunders 1979) and this was retained in later taxonomic checklists (e.g. Christidis & Boles 1994, 2008). However, recent research involving DNA sequencing of the two forms has found 'negligible genetic differentiation, a high degree of gene flow and genetic admixtures' for the long and short-billed forms (White 2011). A further detailed investigation into the genetics, morphology, calls, diet and reproductive behaviour resulted in White's decision to synonymise the two forms to *C. baudinii* Lear 1832. This is a controversial decision which, if accepted by those involved in recovery efforts, could have implications for priorities for conservation management and recovery efforts (White 2011). It is not currently accepted by BirdLife International, BLA or by any government agency.

⁵⁴ CSIRO, the Commonwealth Scientific and Industrial Research Organisation, is Australia's national science agency (CSIRO 2013).

Table 7.1: Ecology of the two White-tailed Black-cockatoo spec	es (Cale 2003; Chapman 2008; Saunders 1974	4).
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	Baudin's Black-cockatoo	Carnaby's Black-cockatoo
Main habitat	Humid and sub-humid zones of South-West WA	Semi-arid to sub-humid areas of South-West WA
Migration	North through Perth March to May; South August to October	Into higher rainfall, coastal areas and overlap with Baudin's
Diet	Marri (Corymbia calophylla), Banksia, Dryandra, Hakea, Jarrah	Wood boring moth (Arthrophora sp.), weevil (Alphitopis nivea),
	(Erodium marginate); Invertebrate larva	Banksia, Dryandra, Hakea, Grevillea, Allocasuarina, Eucalyptus
Commercial crops	Apple and pear orchards	Pinus pinaster and P. radiata, Double Gees (Emex australis),
targeted		lupins, fruiting almonds, pecan nuts
Nesting and	Large tree hollows high up in mature Marri, Karri (Eucalyptus	Large tree hollows from 2 - 10 m high in Salmon Gum
roosting habitat	diversicolor), Jarrah, Wandoo (E. wandoo)	(Eucalyptus salmonophlia) or Wandoo, and shrubland or
		kwongan heath dominated by Hakea, Dryandra, Banksia, Marri,
		Jarrah, Karri
Lifespan	>50 years in captivity but unknown in wild	>19 years
(maximum)		
Breeding	From 4 years of age, average of 0.6 chicks per year	From 4 years of age, average of 1.7 eggs per year, form strong
		pair bonds
		Expansion of breeding range to west and south since middle of
		20 th Century

7.1.2 Institutional/regulatory system

7.1.2.1 Conservation status and governance

A summary of distribution, population, status, threats, conservation objectives, management actions, conservation investment and affected parties for both cockatoo species is provided in Table 7.2.

Legislative responsibility for the taxa lies with both the Commonwealth and WA governments. Both species are listed as 'rare or likely to become extinct' under Schedule 1 of the WA *Wildlife Conservation Act 1950 (WCA 1950)*. Baudin's is listed as 'Vulnerable' and Carnaby's is listed as 'Endangered' under the *EPBC Act 1999* (Chapman 2008; DEC 2012a). The Australian Government has also developed EPBC Act referral guidelines for actions that may impact on three of Western Australia's threatened black-cockatoos including Baudin's, Carnaby's and the Forest Red-tailed Black-cockatoo *C. banksii naso* (DSEWPaC 2012).

Baudin's

Conservation of Baudin's is managed under the combined 'Forest Black Cockatoo (Baudin's Cockatoo *Calyptorhynchus baudinii* and Forest Red-tailed Black Cockatoo *Calyptorhynchus banksii naso*) Recovery Plan' (Chapman 2008). The plan is implemented by the Forest Black Cockatoo Recovery Team (FBCRT) which was established in 2005. At the time fieldwork for this species was conducted the FBCRT comprised 12 representatives from the following organisations: Department of Environment and Conservation (DEC) (8 regional office representatives); DSEWPaC (1); BLA (1); Curtin University (1); Department of Agriculture and Food WA (DAFWA) (1)⁵⁵; WA Museum (1); and WWF-Australia (1)⁵⁶.

WA fruit growers have expressed concern that Baudin's is the principal pest of apple and pear crops (Chapman 2008). An open season notice was in place to shoot Baudin's between the 1950s and the 1980s and this legacy continues in the form of damage licenses issued by DEC allowing orchardists to protect their crops by 'shooting to scare', despite the fact that the most

⁵⁵ Although DAFWA had a place on the FBCRT at the time of fieldwork, no representative was attending meetings.

⁵⁶ At the time of fieldwork the WWF representative was in the process of leaving their position on both Baudin's and Carnaby's recovery teams and no replacement had been identified.

effective means of preventing damage by Baudin's is thought to be permanent netting (Chapman 2008). Nowadays, listing of Baudin's as a 'Declared Pest of Agriculture' under the provisions of the *Agriculture and Related Resources Protection Act 1976 (ARRP Act 1976)* allows for implementation of a management program across the taxon's range.

Carnaby's

Conservation of Carnaby's is managed by the Carnaby's Cockatoo Recovery Team (CCRT) which was established in 1999. At the time fieldwork for this study was being conducted, the CCRT included 17 representatives from the following organisations/sectors: DEC (11 regional office representatives); DSEWPaC (1); BLA (1); CSIRO (1); Department of Planning WA (DPWA) (1); WA Museum (1); WWF-Australia (1); and landholders (1).

When fieldwork for this study was being conducted, the 'Carnaby's Cockatoo 10 year national recovery plan 2002 – 2012' (Cale 2003) was undergoing review. It has subsequently been replaced by a new 10 year national recovery plan, released by DEC in October 2012 (DEC 2012a).

White-tailed Black-cockatoo case study

Table 7.2: Comparison of status, threats and management actions for the White-tailed Black-cockatoo species (Cale 2003; Chapman 2008; Garnett, Szabo & Dutson 2011; DEC 2012a; DSEWPaC 2013e, f).

	Baudin's Black-cockatoo	Carnaby's Black-cockatoo	
Scientific name	Calyptorhynchus baudinii	Calyptorhynchus latirostris	
Distribution	WA, Australia	WA, Australia	
	South-Western humid and subhumid zones, central and	Semi-arid and subhumid interior, including Midwest, Wheatbelt,	
	northern Darling Scarp, Swan Coastal Plain	South Coast, Swan, South West regions	
Population	10,000 – 15,000	40,000	
Status	International - IUCN Red List: 'Endangered A3cde+4cde'	International - IUCN Red List: 'Endangered A2bcde+3bcde+4bcde'	
	International – Convention on International Trade in	International – Convention on International Trade in Endangered	
	Endangered Fauna and Flora, Appendix II	Fauna and Flora, Appendix II	
	National - EPBC Act 1999: 'Vulnerable'	National - EPBC Act 1999: 'Endangered'	
	WA – WC Act 1950: 'Rare or likely to become extinct'	WA - WC Act 1950: 'Rare or likely to become extinct'	
	WA – ARRP Act 1976: 'Declared Pest of Agriculture'		
Management plan	Chapman 2008	DEC 2012a	
Threats	Illegal shooting	Loss of breeding, non-breeding foraging and night roosting habitat	
	Feral Honeybees (Apis mellifera)	Tree health due to premature decline syndromes	
	Habitat loss	Mining and extraction activities	
	Nest hollow shortage	Illegal shooting by landholders	
	Competition for available nest hollows	Illegal taking for aviculture markets	
	Climate change	Climate change	
		Collisions with motor vehicles	
		Disease	
Conservation	Area of occupancy stable or increasing	Within a 10 year period:	
objectives	Number of breeding pairs stable or increasing	Area of occupancy does not decline	
	Number in each roosting flock stable or increasing	Number of breeding pairs at pre-determined sites remains stable	
	Proportion of juveniles in each roosting flock increasing	or increases over three consecutive years	
		Estimates of birds and juveniles across entirety of known roost	
		sites remains stable or increases over three consecutive years	
		Extent of nesting, feeding and night roosting habitat are	

Valuing birds

	Baudin's Black-cockatoo	Carnaby's Black-cockatoo
		maintained across the species' range
Management	Seek funding required to implement future recovery actions	Protect and manage important habitat
actions	Determine and promote non-lethal means of mitigating fruit	Conduct research to inform management
	damage in orchards	Undertake regular monitoring
	Eliminate illegal shooting	Manage other impacts
	Remove feral Honeybees from nesting hollows	Undertake information and communication activities
	Implement strategies to improve breeding success	Engage with the broader community
	Minimise effects of mining/urban development on habitat loss	
	Manage forests for the conservation of cockatoos	
	Identify, manage and protect important sites	
	Map and prepare guidelines for critical feeding and breeding	
	habitat	
	Monitor population numbers and distribution	
	Determine the patterns and significance of movement	
	Maintain Cockatoo Care program / other opportunities	
Affected interests	Govt: DEC, DAFWA, WA Fruit Growers' Association (WAFGA),	Govt: DSEWPAC, Conservation Commission WA, DEC, DAFWA,
	Forest Products Commission WA (FPCWA)*, LGA, DPIWA	FPCWA, Environment Protection Authority (EPA), LGA, WA
	Commercial interests	Planning Commission, Dept. of Defence
	Mineral exploration and mining companies	BLA
	Private landholders	Indigenous people
	Real Estate Institute of WA	Development and infrastructure providers
	Tourism	NRM organisations
	WA Museum	Perth Zoo
	WA universities	Private landholders
		Volunteers
		WA Museum
		WA universities
		Wildlife carers

* A Government Trading Enterprise established to develop and market Western Australia's renewable timber resources (FPA 2009).

7.1.2.2 Conservation investment

From the moment the type specimen of *C. baudinii* was confused with *C. latirostris* around 170 years ago, it would seem that Baudin's 'card was marked' and uncertainty about separating the two forms as distinct species complicates recovery efforts to this day. This is driven by the overlap in their distribution and the great difficulty in telling them apart. Subsequently, much early research failed to distinguish between the two species detrimentally impacting on current understanding of the life history and conservation requirements for Baudin's. Undoubtedly, the recent DNA findings which synonymise the two forms are controversial as they have implications for setting new priorities for conservation management and recovery plans. In turn this affects the interests of those involved in recovery efforts and the debate around whether a reprioritisation would be of advantage to either species is likely to continue for the foreseeable future.

To date, Carnaby's has received significantly more conservation investment than Baudin's, particularly in terms of the duration of the recovery team, research conducted on aspects of its biology and ecology, and funding invested in recovery efforts. Much of this research has been conducted by Saunders over several decades (DSEWPaC 2013f). There has also been greater community investment in Carnaby's conservation efforts, for example, BLA's 'Great Cocky Count' is a community-driven annual survey of Carnaby's roosting sites that has been running for five years (BLA 2012).

Table 7.3 provides examples of major investments made in the conservation of the two case study taxa.

Table 7.3: Conservation investment in the White-tailed Black-cockatoo species (BA 2005; BLA 2012; Cale 2003; Chapman 2008; DSEWPaC 2013e, f; Urban Bushland Council [UBC] 2011; WA Museum 2012; WWF-Australia 2009).

	Baudin's Black-cockatoo	Carnaby's Black-cockatoo
Formal recovery	Forest Black Cockatoo Recovery Team	Carnaby's Black Cockatoo Recovery Team
program	2005 to date	1999 to date
Expert groups	None	Carnaby's Black-Cockatoo Recovery Project (CBCRP)
		Carnaby's Black-cockatoo Research Group (CBCRG)
		BLA WA Project Advisory Group (BAWAPAG)
Major projects	Cockatoo Care' (WA Museum and WA Water Corporation)	'Great Cocky Count' (BLA)
	Document distribution, status, nabitat preferences, breeding	Cockatoo Care (WA Museum and WA Water Corporation)
	(Dereliet' program (DEC & Derth Zee)	several research projects (including Misc, PhD). Induitat
	Defence program (Dec & Pertil 200)	'Derelict' program (DEC & Perth Zoo)
Publications	39 species profile references (SPRAT)	67 species profile references (SPRAT)
Funding	\$1,810,500: 10 year recovery program	\$2,253,100: first five years of recovery program
	\$11,038: Threatened Species Network Grants (2005 – 2006)	
Public symposia	2011 Endangered Black-cockatoos in Western Australia	2005 Carnaby's Black-cockatoo Future Directions Symposium
		2008 Carnaby's Black-cockatoo Symposium
		2011 Endangered Black-cockatoos in Western Australia
Stakeholder	Australian universities	Australian universities
involvement	DAFWA	BLA
	DEC	Community groups
	Recovery team	
	WARGA WA Museum	FFC Land Concentration District Committees
	WA Water Corporation	Drivate landholders
	WA water corporation	Private consultant
		Recovery team
		Perth Zoo
		WA State. Perth Regional and South Coast NRM Programs
		WWF-Australia

7.1.3 Social-structural system

7.1.3.1 Social and economic considerations

The range of Baudin's and Carnaby's crosses several regions including Perth, Peel, Mid-West, Wheatbelt and South-West. These regions, already the most populous in the state, are predicted to experience human population growth of up to 3.5% by 2026 (Department of State Development [DSD] 2012) and rapid urban expansion is continuing.

WA is renowned for its diversity of biological resources. The South-West sits within the Southwest Australian Ecoregion which is one of 34 global biodiversity hotspots recognised by Conservation International (WWF-Australia 2012). It has also been recognised as an Endemic Bird Area by BirdLife International and as a Centre for Plant Diversity by WWF and the IUCN (WWF-Australia 2012). It is also a popular tourist destination (Australia's South West [ASW] 2012).

A booming mining industry provides the greatest contribution to the state's share of GDP (32%), followed by construction (11.7%), and together these industries employ 18% of the state's population (DSD 2012). The South-West is particularly rich in valuable commodities such as construction materials, alumina, gold, iron ore and coal (DSD 2012). The Wheatbelt covers 19.3 million hectares and is one of the most important cropping areas in the country. It is also home to many unique plants and animals but post-colonial landclearing up to the 1980s means that only 18.1% of the Wheatbelt is still covered by remnant vegetation (WWF-Australia 2012). WA makes up around 9% of Australia's apple and pear production and this industry has played an important part in the history of Western Australia (ABS 2007). However, the survival of the industry across Australia is currently threatened by high energy and labour costs, foreign imports and associated biosecurity risks and environmental issues along with a price war between the two top supermarket chains (Apple and Pear Australia Ltd [APAL] 2012).

Baudin's is an icon of the South-West forests and its conservation could benefit the people of WA by attracting tourism to the region, particularly in areas where the logging industry has declined (Chapman 2008). If sufficient feeding and breeding resources are protected in the South-West forests, Baudin's may be less likely to feed in orchards, thereby reducing the

management costs of fruit damage to fruit growers, the general community, DEC and DAFWA (Chapman 2008).

Both Baudin's and Carnaby's use public and private lands for their breeding, feeding and roosting requirements. Public land mainly comes under the jurisdiction of the WA Government and several departments with conflicting interests may therefore engage with the species, including DAFWA, DEC, DPWA and the FPC. Where the cockatoos occur on private land, recovery actions require liaison between stakeholders to protect habitat through statutory planning and environmental approval assessment processes (DEC 2012a).

Carnaby's can use a range of introduced plants as new food sources, including pine plantations, nut crops and spilt canola (DEC 2012a). Removal of pine plantations without providing alternative food resources is likely to significantly impact on available food resources for the cockatoos (DEC 2012a).

7.1.4 Nature of fieldwork undertaken and primary data collected

Thirty one semi-structured, qualitative interviews were conducted between 6th October and 13th December 2011 with key informants identified in the stakeholder analysis (Section 3.4.3.2; Table 7.4). As a result of institutional arrangements and the wide distribution of key informants across the species' range, five locations in South-West WA were visited during fieldwork for this case study: Perth and outer suburbs, Narrogin, Manjimup, Albany and Bunbury. During fieldwork it was also possible to visit key areas of the focal species' habitat and experience both species in the wild, providing a better understanding of the case study context.

The stakeholder analysis revealed a higher number of conservation practitioners working on Carnaby's than on Baudin's and due to the overlap in the distribution of the two species there are several individuals working on both cockatoos. To gather adequate data for both species it was necessary to conduct a number of interviews with stakeholders who are experts on both species. This resulted in the following mix of key informant interviews: Baudin's: 6; Carnaby's: 16; both: 9. Interviews were conducted with key informants representing the following: Commonwealth and state/territory government departments (10 representatives); academia (6); ENGOs (3); consultants (2); scientific organisations (2); volunteers (2); business/industry (1); habitat restoration agencies (1); landholders (1); media (1); natural resource management agencies (1); and wildlife rescue groups (1). Nearly a third of interviews (nine) were conducted with DEC representatives, reflecting the organisation's high level of involvement in the recovery of both species.

Table 7.4: Key informants interviewed in the White-tailed Black-cockatoo case study.

Taxon	Key informant identifier	Sector represented	Scale of interest	Connection to case study taxon
Baudin's	B#1 State government	State government	Regional	Governance; Member: CBCRT, FBCRT
Black-cockatoo	B#2 State government	State government	Regional	Governance; Member: CBCRT, FBCRT
(B)	B#3 Academic	Scientific	Regional	Member: FBCRT; Research on taxon
	B#4 Consultant	Private	Regional	Research on taxon
	B#5 ENGO	Community	International	Advocacy for taxon; Member: CBCRT, FBCRT, BAWAPAG
	B#6 Volunteer	Public	Local	Research on taxon
Carnaby's	C#1 Restoration	State government	Regional	Landholder education and support
Black-cockatoo	C#2 Consultant	Private	Regional	Member: BAWAPAG
(C)	C#3 Industry	Private	International	Commercial use of habitat
	C#4 Academic	Scientific	National	Research on taxon
	C#5 Academic	Scientific	National	Member: BAWAPAG; Research on taxon
	C#6 Academic	Scientific	National	Research on taxon
	C#7 ENGO-birding	Community	National	Advocacy for taxon; Member: BAWAPAG, CBCRP
	C#8 ENGO-birding	Community	National	Advocacy for taxon; Member: CBCRT, BAWAPAG, CBCRP
	C#9 State government	State government	Regional	Governance; Member: CBCRT
	C#10 State government	State government	Regional	Governance; Member: CBCRT, FBCRT, BAWAPAG, CBCRG
	C#11 State government	State government	Regional	Governance; Member: CBCRT, FBCRT
	C#12 State government	State government	Regional	Governance; Member: CBCRT
	C#13 NRM	State government	Regional	Research funding
	C#14 Volunteer	Public	Local	Advocacy for taxon
	C#15 Landholder	Public	Local	Member: CBCRT; Management of key habitat
Baudin's and	B-C#1 State government	State government	Regional	Governance; Member: CBCRG, BAWAPAG
Carnaby's	B-C#2 State government	State government	Regional	Governance; Member: CBCRT, FBCRT, CBCRG
Black-cockatoos	B-C#3 State government	State government	Regional	Governance; Member: CBCRT, FBCRT
(B-C)	B-C#4 Cwlth government	Cwlth government	National	Governance; Member: CBCRT, FBCRT
	B-C#5 Academic	Scientific	National	Member: CBCRG
	B-C#6 Academic	Scientific	National	Research on taxa
	B-C#7 Wildlife rehabilitation	Community	National	Rehabilitation of taxa
	B-C#8 Museum/zoo/breeding	Scientific	National	Research on taxa
	B-C#9 Museum/zoo/breeding	Scientific	National	Member: CBCRT, FBCRT
	B-C#10 Media	Private	Regional	Publicity for taxa
7.2 Key informant interview analyses

7.2.1 Valuational system

7.2.1.1 How do Australians value threatened birds?

7.2.1.1.1 Major influences on attitudes towards nature

All key informants stated they had an interest in nature and described how it began at an early age and developed as they grew older. Most reported being influenced by family members, usually one or both parents, while others grew up on farms or close to nature. Several described their love of nature as 'innate'. Experiencing nature at an early age, either as a normal part of life or on special occasions, was described as being fundamental to them developing an appreciation for the natural world. This fascination, they indicated, was enhanced to some extent by watching nature-based documentaries (e.g. those presented by Britain's David Attenborough) or reading seminal books (e.g. by Gerald Durrell). Commonly, key informants' paths to their conservation-based careers were described as being directed by a significant event such as meeting someone inspirational (e.g. Australian naturalists like Harry Butler, Peter Scott, Dom Serventy or Michael Morcambe). This tended to happen either at work, university or through a nature-based group (e.g. Gould League, WA Naturalists Club or a bushwalking club). One key informant with a very close relationship to nature while growing up described working in a mine immediately after high school, a role she discovered went 'utterly against her core values' (C#8 ENGO-birding), but which ultimately gave her the confidence to complete a conservation biology degree at university.

7.2.1.1.2 Attitudes towards birds and threatened birds compared with other kinds of wildlife

Key informants mostly expressed ecological, experiential and humanistic avifaunal attitudes towards birds (Table 7.4). Many key informants said they enjoyed the experience of listening to or observing birds. They indicated this was mainly because birds are mostly diurnal and can be found almost anywhere, thus enhancing their ability to 'bring the bush to life' and connect humans to the natural world. Several key informants described taking part in birdwatching or bird surveys in their spare time; activities considered more difficult to do with other kinds of wildlife. Birds were described as performing a number of ecological roles including helping researchers understand the ecology of a system, acting as indicators of ecosystem health, pollinating and regulating other species, and acting as 'good ambassadors' for other kinds of wildlife.

Around half of the key informants described being more interested in other kinds of wildlife than birds, particularly reptiles and marine mammals, while others found systems and ecological relationships more interesting than any particular group of flora or fauna. Many said it was their job which led them to work on birds, rather than their own choice, but generally their experience of working with birds had resulted in a greater appreciation for them.

Key informants mostly expressed conservation, moral, experiential and humanistic avifaunal attitudes about threatened birds (Table 7.5). Threatened birds were said to play a special role for researchers in terms of representing threatening processes or species that might be lost, while at the same time they can showcase important conservation issues to the public. As a group, threatened birds were viewed as useful for engaging people in conservation activities, including volunteers or landholders, particularly the more easily identifiable or charismatic species. They partly attributed this to people being generally very interested in and aware of birds already and partly because birds are still visible within landscapes where other types of wildlife may be difficult to find or no longer exist. Some threatened birds were also thought to be interesting purely because they have evolved to live within a restricted range or to have particular habitat requirements (i.e. they are specialists).

Several key informants described being motivated to conserve threatened birds because of their important ecological role. Others gave moral reasons, including that birds have an intrinsic right to exist (as do other types of wildlife), that humans do not have the right to impinge on them and that current and future generations have a right to experience them. Conflicting interests across government departments could sometimes give rise to moral arguments about impacts of actions on conservation outcomes, according to one key informant. A handful of key informants mentioned being grateful for having worked with threatened birds because of the unique opportunity they provided to experience things when otherwise they would never have

had the chance to (e.g. handle very rare birds). One key informant described the process of listing threatened species as invaluable:

'...because it is a report card. It is a process whereby people and governments and countries can be held accountable. Societies can be held accountable and that's invaluable. But again the reason that's important to me is because it's a tool for engaging the community and it's a mechanism for engaging action' C#10 State government. Table 7.5: White-tailed Black-cockatoo key informant statements about birds and threatened birds by avifaunal attitude categories (number of statements shown in brackets where more than one similar statement made; blank cells indicate no statements were made), (n=31).

Attitude	Statements about birds	Statements about threatened birds
Aesthetic	Appreciate their beauty (3); aesthetic interest beyond scientific interest	
Biophysical	Interested from a scientific perspective; interested in and knowledgeable about birds; enjoy diversity of birds; diurnal so easier to work on than other wildlife; interested in natural history	Interested in rare birds with tiny populations or are geographically isolated; interesting behaviour
Conservation	Common birds become uncommon very quickly; we should be studying and investing in common declining species because once they're threatened they become very expensive and time-consuming	Threatened birds are useful for engaging people in conservation; good motivation tool for challenging people about whether they want species to go extinct; birds are useful for landscape conservation especially where other wildlife has disappeared; you can showcase species and present issues to the community; threatened bird programs make it very easy to engage with people outside the department; there's a lot of interest so we get some good research done; interested in why some species are threatened in some places but not others; interested in how we can mitigate disturbance effects; important because they represent threatening processes that we need to better control; wouldn't like to work on a species that isn't threatened; most important thing I can do with my life is work towards protecting the natural world; it's frustrating that we don't have the resources to conserve species
Ecological	Interested in ecological role (2); interested in disturbance ecology and how humans evolved with the environment and their impact on fauna; interested in threatening processes; common species can help us understand ecology of a place; birds are very good ecosystem indicators, so you can judge health of environment for the diversity and abundance of birds in an environment; important part of ecosystem	If birds are threatened means there's decline in ecosystem health
Experiential	Accessibility is an advantage (3); visibility is an advantage (2); interested	Privilege and reward to see threatened birds in the wild; my role means

	in familiar birds from home; enjoy seeing birds; grew up on a farm so have always had interest through hunting and being involved in natural environment; enjoy birdwatching; interesting to watch; you can enjoy birds for personal pleasure as well as for work; has been a great experience working with birds; birds vital part of the bush	I can experience nature in ways that other people can't; I'm very lucky to have an exciting and fun job where I work with such amazing things; we meet people from all over the world;
Humanistic	Long-term interest (2); engaging behaviour; passion for the environment and nature in general; people more interested in birds than nocturnal animals; enjoy birdwatching because encouraged by parents/Dom Serventy; public buys into things you can identify; I like birds	Looking out for underdog; we want to protect all threatened species; good way of engaging with landholders because they like having them around and notice when species aren't around; feel a sense of loss when species go extinct
Mastery	Contributed to educational bird collections; try to see new birds in a new country; like to see different birds, tick them off my list	
Moral	Humans should learn to share; don't like the idea that anything is threatened; hate that humans have imposed on anything in the natural environment; everything has a right to exist in the wild	Childhood memory of watching environmental declines; don't want species to go extinct on my watch; the idea of things being extinct is abhorrent to me if it's our fault; it seems wrong to give up on species just because they are genetically extinct; we need to be controlling threatening processes better or we will continue to lose lots of species; because they're threatened we need to do something about them; listing threatened species is a valuable report card for societies, governments and countries to be held accountable; important to conserve all threatened species;
Symbolic	Iconic to humans for spiritual, natural reasons; flagship or iconic birds essential from marketing perspective	Good icons for conservation
Utilitarian	I've benefitted from working with great explorer naturalists	We need to invest in species where we can make a difference; hate to see money thrown at a species just because it's noisy

7.2.1.1.3 Is conservation of threatened birds important to the Australian public?

When considering the public as a single entity, some key informants suggested that the broader Australian public is not interested in conservation. They attributed this to the low priority conservation is given in daily life, specifically mentioning: little interest in, knowledge of or concern about the extent of 'the problem'; people having other, more pressing, priorities; and a greater interest in wildlife overseas (e.g. African mammals) than in Australian fauna. Threatened birds were also seen to be promoted as vehicles for other causes sometimes, or obscured by conflicting interests across government departments. Some said that although people might not necessarily want species to become extinct, they tend to make decisions that appear to put themselves first:

'You've got to break down this false dichotomy which undermines people's value system. They say: "Well you've got to decide whether you want Carnaby's or development." No you do not have to choose between those two. Our future actually lies in having both' C#10 State government.

One key informant alluded to the negative perception of conservationists as 'rabid greenies' which prevents people from getting involved 'for fear of being tarred with the same brush' (B#1 State government).

Those who felt conservation was important to the public pointed to the abundance of different interest groups, such as people who love birds, birdwatchers and nature tourists and many examples of how these groups can or do engage with birds and their conservation were cited. BLA was named by several key informants as a key instigator of community engagement through its various survey and monitoring programs. Cockatoos were suggested as being the best example of community engagement because they are embedded in community memory, readily observed, and associated with place and time across the landscape: 'like a flower flowering at a particular time' (C#13 NRM).

7.2.1.2 Who is involved in threatened bird conservation?

7.2.1.2.1 Who would you consider to be the key organisations involved in conservation of the case study species?

Key organisations most commonly mentioned tended to be those represented on the Baudin's and Carnaby's recovery teams. Also mentioned were: Perth Zoo; a handful of other state or federal government agencies or programs (e.g. DAFWA, CSIRO, regional NRM, local government and Land for Wildlife); and some local ENGOs conducting campaigns for blackcockatoo conservation (e.g. Urban Bushland Council, Conservation Council, Cockatoo Coalition, Black-Cockatoo Society). A couple of key informants mentioned the mining company Alcoa. Individuals such as key landholders or prominent volunteers were also named.

7.2.1.2.2 Who has most influence on threatened bird conservation and what are their motives for conserving threatened birds?

Government was considered to have the most influence overall on threatened bird conservation but personal interests and skills were thought to influence decision-making processes at every level. It was said that local governments could do more to maintain habitat. However, state and Commonwealth government agencies (including DEC) were considered most influential because they were said to have a statutory and legislative responsibility to manage the environment. DEC was singled out as having a strong commitment to do this through good science and passionate employees. Additionally, the Commonwealth Government provides funding and recovery planning support to state agencies when the *EPBC Act 1999* is triggered. At a policy level, ministers finally determine which decisions are approved but a three year government cycle was said to hamper any chance of program continuity. Politicians were also seen as influential but likely to be driven by short term populism rather than taking a more strategic view.

'It's probably public opinion, especially with our government at the moment. I guess if they can sell something to China that's all they're really worried about. We don't have the most conservation-minded government in WA at the moment' B#3 Academic. BLA was viewed as being almost as influential as government. The organisation's main motive was identified as a love of birds personified by dedicated and passionate employees. It was described as conducting important research and monitoring work in the public interest and building an impetus for conserving birds. Its methods were said to be characterised by strong research credibility, non-partisan objectives, effective lobbying and community engagement tactics and an ability to deliver results.

A handful of key informants suggested the community could potentially influence threatened bird conservation, either by individuals getting involved in conservation initiatives or by large groups of people lobbying for particular outcomes.

Individuals such as teachers, well-respected spokespersons and scientists were also identified as being crucial for their role in education and raising awareness.

A handful of other influential groups or individuals were mentioned including:

- industries which can detrimentally impact on birds (e.g. urban development, mining, commercial fishing);
- the media, which can influence public opinion; and
- funders and high-level decision-makers who decide what is worth working on and identify targets.

7.2.1.2.3 What messages do stakeholders communicate to the public?

Key informants suggested a range of different strategies which were consistent with individual interests and priorities rather than with organisational goals. Most messages combined a mix of reasons and examples of statements are shown in Table 7.6.

White-tailed Black-cockatoo case study

Table 7.6: Messages communicated by White-tailed Black-cockatoo key informants about the importance of conserving threatened birds, by attitude category and frequency of mentions (n=31).

Attitude	Message	Key informant expressing attitude	
Biophysical	Uniqueness to area	1 x ENGO; 1 x Scientific; 1 x State government	
Conservation	Importance of protecting habitat	5 x Academic	
	Role of town planners in maintaining urban habitat	1 x Consultant	
	Actions individual can take	1 x Restoration; 2 x State government; 1 x Volunteer	
Ecological	Importance of the taxa's role in an ecosystem	5 x Academic	
	Provide as much habitat as possible	1 x Consultant	
	Health of birds indicate health of environment	1 x Restoration; 2 x State government; 1 x Volunteer	
Experiential	Poorer world for humans without diversity	3 x Academic; 1 x ENGO-birding	
	Wonder and enjoyment of the natural world	1 x Scientific	
Moral	Local ownership of species (e.g. endemic to area)	3 x Academic	
	Personal responsibility through own actions	2 x ENGO-birding	
	Duty to preserve species for future generations	1 x Scientific	
	Failure to act may result in loss of species	3 x State government	
	Species' right to exist	1 x Academic	
	Everything is important and has a role to play	1 x ENGO-birding; 1 x ENGO; 1 x Restoration; 1 x State government	
Utilitarian	Human dependence on biodiversity for health and well-being	2 x Consultant; 1 x ENGO	
	Practical benefits of species (e.g. tourism)	1 x State government	

7.2.1.3 Do the values held for particular threatened birds affect the success of strategies to conserve them?

7.2.1.3.1 Which values are held for particular species of threatened birds?

How did you get involved with the case study taxon?

Several key informants interviewed about Baudin's described having developed affection for the species during childhood which led to a decision to become involved in their recovery when they later learned about its conservation status. Others reported they began working with the species as part of their role and have since grown to love the cockatoos.

'I think it was the sadness of the whole story of the black-cockatoo species and the pressure they're under... it's quite a bit of a shock. Then just by coincidence we had the opportunity to make that story and let people know' B-C#10 Media.

A slightly different pattern emerges for Carnaby's. A number of key informants described how their general interest in cockatoos led to a role that coincidentally focused on Carnaby's recovery. Others recalled seeking employment in their field of expertise, such as conservation, physiology, ecology or habitat restoration, and coming across an opportunity to work on the species then learning about them 'on the job'. Only a handful had known Carnaby's their whole lives.

'I could have come and worked on bandicoots or something, I had that freedom. For me it was a "penny drop" sort of moment... I thought: "Why aren't I working on Carnaby's?" I've really grown to love the cockatoo' C#10 State government.

What is most important to you about conservation of the case study taxon?

Key informants perceived habitat loss and fragmentation to be the most important threat to both Baudin's and Carnaby's, therefore protection of habitat is a key conservation objective. However, very little is known, especially in the case of Baudin's, about habitat use, preferred food, or which habitat is most important to survival, therefore key informants identified these as key areas for urgent research. Since both species are long-lived with low recruitment rates, key informants said there is also a vital need to gather data on population size and dynamics to predict future population growth. One said the challenge in conducting these kinds of studies has been a lack of student uptake because the mining 'boom' has lured many potential candidates towards more lucrative employment.

Those working with the birds found many reasons for holding strong feelings about them: they indicated that the birds enrich people's lives and are easy to relate to; they have a historic connection to the area through the French explorers who named them; they have beautiful calls; they are admired for their bill adaptation and specialised feeding techniques. Specific feelings about Baudin's centred around witnessing them being shot and how little is known about them except their name.

'(Baudin's are) another one of these beautiful species that's destined for extinction in the modern age... So it's the sucker in me: you've got to do something about those species' B-C#2 State government.

Baudin's

Additional concerns for Baudin's focused on short and long-term projections for landscape change due to the impacts of climate change, fire and various tree diseases such as dieback *Phytophthora cinnamomi* and Marri canker *Corymbia calophylla*. Two further processes compound this problem: harvesting of habitat trees for silviculture by the FPC WA; and removal of habitat trees by mining companies during strip-mining activities. Loss of habitat is thought to increase the reliance of Baudin's on supplementary food sources such as orchard fruits. Key informants consequently identified its second most important threat as illegal shooting by orchardists. Many orchardists cannot distinguish Baudin's, which impact on their livelihoods to some extent, from Carnaby's and the Forest Red-tailed Black-cockatoos, which do not. Hence, some regard all black-cockatoos as pests and all three taxa subsequently may be targeted by damage mitigation measures, such as illegal shooting. Additionally, according to two key informants, some orchardists' perceptions about the extent of damage caused to their crops by black-cockatoos appear to far exceed the actual financial cost incurred. For some, the threat of shooting is a moral indictment on Australian society:

'With Baudin's what was most important to me was the fact that nobody really knew about this problem: a threatened species being blasted out of the sky in the name of apple and pear production. To me that seemed shocking in

this day and age that a species is still threatened with going extinct as a result of direct persecution' B#5 ENGO.

It was suggested that both these threats should be managed at a policy level. In the first case, better inter-governmental information exchange, particularly about the scale of potential Baudin's habitat and the extent of its harvesting, could inform research priorities and help to determine more accurate threshold triggers for referral to the *EPBC Act 1999*. Paramount to key informants in the second case is helping the government to understand the importance of orchard netting and protection of Baudin's from shooting. A handful of key informants suggested that public pressure on politicians could help achieve some of these goals, if the issues were more broadly understood.

A small group of key informants working with Baudin's described how persistence and longterm strategising have been essential for achieving goals. This was reported as being partly because of the difficulty in finding vital resources to implement recovery actions in a timely way and partly due to conflicting values held by different WA state government agencies:

'One of the real difficulties is recovery teams are usually driven by government departments which makes it politically very difficult for them to do a lot. So, they have to get approval from ministers to do this and that and whatever... It's hard because the forestry side of land management is run by the government as well as the conservation side so it's really a political issue ... even to the point that one of the DEC people had written a really nice modelling paper looking at the shooting effects on Baudin's cockatoos but they can't get permission to publish it' B#3 Academic.

Carnaby's

Because Carnaby's inhabits both public and private land and is a common sight in Perth city, more people interact with it than with Baudin's and this transfers to greater opportunities for community participation in its conservation. Firstly, key informants proposed that public pressure on the WA state government is vital and should focus on: improving out-dated legislation (*WC Act 1950*) by including more relevant clauses for threatened species protection; as well as acknowledgement that the species is threatened and bearing more responsibility for its management. Secondly, it was said that landholders across the region can directly contribute by protecting remaining habitat on their properties.

Key informants described Carnaby's as an iconic, umbrella species because of its important ecological role across a broad range of habitats. They said this combination of attributes makes it particularly valuable since conserving Carnaby's necessarily implies conserving habitat across the landscape and numerous other vulnerable species living within it.

Working with Carnaby's has caused several key informants to appreciate the benefits of working with large networks and a wide range of stakeholders. But some said that 'keeping everyone on the same page' can be quite challenging, and not all stakeholders are perceived to always have the species' best interests at heart:

'From a social perspective I think that Carnaby's is a bit of a melting pot of personalities... Suddenly there is a pot of money for Carnaby's and everybody wants to get their hands into it. So that's the ugly side of it, which I don't like at all' C#5 Academic.

One key informant described how a belief in the Buddhist philosophy 'flavoured' his attitudes towards conservation of Carnaby's:

'There's an advanced soul floating around doing its thing upon the earth. So there's that element... to my personal appreciation and desire to protect as best as possible their future which is linked into millions of other species' C#13 Natural resource management.

Do you personally believe that conservation efforts for the case study taxon will succeed or fail?

The meaning of 'conservation success or failure' was immediately clear to the majority of key informants but a small number felt the need to explain their interpretation of it. For one person, success meant survival of the species in their lifetime and hopefully beyond, for another it meant keeping the species near at hand within the natural environment rather than far out of sight or in captivity.

Baudin's

On the whole, those working on Baudin's are pessimistic about the species' survival into the future. It was forecast that the next few decades will be crucial and most likely the species' numbers will decline and never recover. Mainly this comes from a lack of data on which to base

good decisions, especially about the current population size and structure, as well as about breeding and feeding habitat. Key informants blamed forest management practices for creating a massive change from old growth nesting habitat to unsuitable pole timber. Mining company activities were also charged with reducing available nesting habitat. They felt that if illegal shooting and an aging population are added to the mix then conservation failure is a foregone conclusion:

'You've got forestry demands and fire management and there are all those problems that this particular species is particularly susceptible to. And the shooting; because they're such small populations, they are long-lived birds which don't breed very often and you only have to lose a few individuals...they are major problems that are difficult to deal with' B#3 Academic.

Carnaby's

Far greater optimism was shown for Carnaby's than Baudin's, however there was still a general sense that things will get worse before they improve in terms of threat mitigation and population stabilisation or recovery. Two key informants commented that Carnaby's may survive at the expense of Baudin's by out-competing or out-breeding it.

Many key informants pointed to the adaptability of the species as their reason for optimism, citing evidence of its opportunistic ability to find new food sources and to expand its range into new habitats. The population size of Carnaby's was thought to stand it in good stead so that if no more habitat is lost there is a chance it will survive into the long-term. It was suggested that local population extinction is likely to take place due to habitat loss, especially within Perth city and the Swan Coastal Plain because of ongoing development planned for those areas, and possibly in the Wheatbelt because of salinisation. However, these are not deemed to be the most crucial areas for conservation investment; survival of the species will mostly be dependent on the implementation of landscape scale restoration and protection of long-term viable habitats.

It was thought that the very public nature of Carnaby's in terms of its presence in the Perth metropolitan area and the conservation attention it currently receives from BLA and elsewhere lifts its chances of conservation success, although its visibility is a double-edged sword. Two key informants offered the view that a change in government might be crucial to preserve the

species because implementing adequate legislation and over-arching controls to ensure its protection were necessary. A powerful example from 10 years ago was given, when a change in WA state government was driven by a forest conservation-centred election campaign run by the political party 'Liberals for Forests':

'A decade ago it was just on the cusp of a boom. But there wasn't the huge population pressure and the new community who've come over here aren't fully appreciative of what was and what has already gone...so there seems to be lots of birds because they fly over in big flocks so there must be lots and they're not threatened' B-C#4 Cwlth government.

When asked what it would mean to them if conservation efforts for Carnaby's or Baudin's did not succeed, key informants expressed a range of concerns. Those who would feel disappointment or sadness tended to take some personal responsibility for the species and said they would be left wondering what they could have done differently. Those who described frustration or moral outrage mostly accused the government of failing to address the threats, particularly given the seemingly adequate funds available as a result of a booming economy. Two key informants criticised human nature and would despair at our inability to grasp the importance of the natural environment to our own survival.

'I think Carnaby's is probably the iconic species for almost all Western Australians because it is so unique. So, if we didn't get it right, WA would really have to look at itself long and hard. It's an absolutely essential charismatic species that needs as much input as possible' C#6 Academic.

Is it important to you that a population of the case study taxon exists in the wild?

All key informants agreed it was important that populations of Baudin's and Carnaby's exist in the wild and some emphasised the role the cockatoos play in the ecological history and fabric of the area. The cockatoos were described as vital to forest and woodland health. As 'ecosystem engineers' they were noted as having bills specifically adapted for maintaining their particular habitats (e.g. pruning Banksia, Marri and Jarrah trees, dispersing seeds, and preying on grubs). One key informant described Carnaby's ecological role as part of an evolutionary progression of the natural environment which he felt could be explained in spiritual terms: 'I can justify that airy-fairy Buddhist stuff by saying that (Carnaby's) is a keystone species: it's a major... disperser of banksia seeds...' C#2 Consultant.

Almost as important to key informants was the cockatoos' contribution to the social history and 'fabric' of the area and this was a recurring theme throughout the study, particularly for the better known Carnaby's. The cockatoos stir strong feelings, such as love, pride and a duty to protect, and key informants were keen to demonstrate this:

'It's important. How great is it to live in a place like Perth and have blackcockatoos flying around? People around the world would kill for this stuff. I'd be quite mortified if my kids and my grandkids don't have that same opportunity' C#11 State government.

Those who grew up in South-West WA reported that the birds have been a special part of their life, but also something shared and appreciated across the community. For others who regularly encountered the birds, they reported their interest has to do with the 'spectacular' sight and sound of them, their interesting behaviour and intelligence:

'I just like having them around. As soon as the chicks fledge they leave... It seems very quiet and a bit lonely when they're gone' C#15 Landholder.

A number of key informants also expressed the view that all species have an inherent right to exist in the wild, which was described as either a moral or spiritual obligation to ensure their survival into the future. They believed this is mostly because humans do not have the right to interfere with evolutionary processes but also because preservation of the cockatoos would assist with preservation of other species. Several went on to say that a life in captivity for remaining individuals would not be considered acceptable for moral reasons or because it would be too expensive.

Can the local community influence conservation of the case study taxon?

Because Baudin's tend to inhabit forested areas with low human populations, they are 'out of sight and out of mind'. The only community key informants identified as potentially having any direct contribution to their conservation were the farming and fruit growing communities, i.e. those who are mostly negatively affected by the presence of the birds due to their impact on crops. It was suggested these communities could implement initiatives such as preventing illegal shooting from taking place and adopting non-lethal bird scaring techniques on orchards and farms.

Beyond horticultural interests there is the public at large. Key informants felt there is too little awareness of the birds or their plight for any significant contribution to be made by any particular sector. However, they thought raising awareness and changing public perceptions about the birds would be a step in the right direction. A handful of key informants raised the notion of a 'cockatoo-friendly fruit' program, similar to 'dolphin-friendly tuna', whereby orchardists who actively conserve black-cockatoos could label their fruit appropriately and offer consumers an opportunity to contribute to conservation through ethical consumption. This has been attempted by DEC in the past but it was suggested that a non-government group could manage it better due to fewer political restraints.

In direct contrast, due to the broad distribution of Carnaby's across a range of tenure types, key informants identified many different sectors of the community that can play a direct role in the species' conservation including: those in control of development (e.g. government agencies and mining companies); volunteers; and landholders.

It was suggested that a vitally important role for large numbers of the community would be to lobby against inappropriate development, particularly since employees of state government departments felt they were not permitted to do so. Key informants thought volunteers could assist by participating in BLA's monitoring programs or by identifying development proposals. Wheatbelt landholders in particular were identified as being able to restore areas of lost or degraded cockatoo habitat, ultimately creating a better lifestyle for future generations of farmers. Tapping into the emotive connection people have for the land by encouraging them to experience nature for themselves was also recommended, for example through planting schemes at a backyard or community level, taking people into the bush or providing opportunities to interact with wildlife:

'Take a shrieking, screaming cockatoo to an agricultural show.... the kids and the mums and dads love them... One of the things we do in WA badly, probably in Australia too, is say: "Keep off! The bush is fragile." You will never get people to appreciate the bush if they don't walk in it and love it'C#1 Restoration.

Does one of the case study taxa receive more in terms of conservation investment than the other?

As reported by interviewees, Carnaby's has clearly received far greater conservation investment historically than Baudin's. This is evidenced through the number of published studies (twice as many for Carnaby's than Baudin's), extent of stakeholder involvement in Carnaby's (e.g. CBCRT, CBCRG and BAWAPAG), community engagement (e.g. volunteer participation in Carnaby's population surveys) and public profile (e.g. awareness of Carnaby's but not of Baudin's).

Key informants suggested a number of reasons for this imbalance. Firstly, Saunders' decades-long research on Carnaby's and passion for the species have paved the way for Carnaby's conservation and action by providing baseline data which can be further developed. Secondly, the relative ease with which Carnaby's can be studied compared with Baudin's, particularly its breeding habitat, has made Carnaby's a far more accessible subject for further study. Thirdly, it was suggested that the emotion Carnaby's evokes may influence researchers to work on it even though it may not be the best value in terms of conservation investment.

'I'm passionate about Carnaby's because I think we can probably make a difference. Baudin's are in far worse trouble; they're on the slide, they're gone. They're going to get shot into extinction, no doubt about that. And yet we seem to ignore it. But Carnaby's, because it's studied so well and so well-known and there's scientific proof that it's on a decline, it's just enabled it to happen... you get to know the bird, you get to like them. They're a ratbag. They've got lots about them. They're loyal, bond well. They let you study them. Easiest bird to study, film and poach! "Raah raah here's my nest! Follow me"'C#11 State government.

From a community perspective, Carnaby's was described as a species of interest to BLA because of what key informants described as its 'keystone' status and the complex mix of stakeholders involved in their recovery. Key informants said this has created an opportunity for the organisation to implement its philosophy of engaging with different interest groups across the South-West community and beyond. Carnaby's visibility and charismatic behaviour were said to render it hugely popular and it is considered an ideal flagship for community campaigns

to prevent loss of habitat and associated bushland, particularly in inner city and Wheatbelt areas.

From a policy standpoint, the combination of Carnaby's occurrence in the Perth metropolitan area and rapid urban expansion was described as providing a focal point for political pressure. Key informants said it is highly significant that potential impacts on both Baudin's and Carnaby's must be referred to the *EPBC Act 1999*. However, a lack of data about Baudin's requirements and extent of available habitat makes it difficult to accurately calculate thresholds for triggering referrals, therefore few proposed actions are actually referred for this species. According to one key informant, *EPBC Act 1999* referrals due to impacts on Carnaby's from urban development are much more common, therefore Carnaby's has a higher profile in terms of communications to the Environment Minister and responses from DEC. They explained how this process has resulted in a need for better policy and coordination as well as better effort to do something about separating the impact from the need to protect them. To illustrate, some Commonwealth funding provided to DEC to implement Carnaby's recovery actions was used to implement a habitat offset program in and around Perth.

But some thought that perhaps Baudin's will finally receive greater conservation attention in the future. There was a perception among key informants that Carnaby's ability to adapt may have done more for its preservation than any conservation effort, and some saw it as a 'catchall' for those who would use it as a tool to protect interests other than those of just the cockatoo. Some of those who have helped promote Carnaby's to its iconic status felt that attention may now be better diverted to 'more deserving' species, such as Baudin's.

7.2.1.3.2 Which significant characteristics lead to a species' status as a key or iconic threatened species in terms of political decision-making, significant events and social attitudes?

Both Baudin's and Carnaby's were described by key informants as 'iconic'. For many key informants, an iconic bird is one that people strongly associate with a particular place or time, or that has an interesting folklore in a region. For others, an iconic bird has appealing physical characteristics: most importantly it is charismatic or engaging but may also be unique, large, noisy or visible. Some key informants said the ability of iconic birds to capture the public's

imagination made them important tools for conservation because they can be used to represent the conservation requirements of a habitat or other threatened species, or to help people understand how important the birds are to their own quality of life. A few key informants suggested that working on iconic species was more important than working on less interesting or visible species (e.g. the Red-tailed Phascogale *Phascogale calura*, a nocturnal carnivore restricted to isolated patches of the Wheatbelt region) because of their capacity to attract conservation funding and support.

The Noisy Scrub-bird *Atrichornis clamosus* was the only other species that key informants described as iconic.

7.2.1.3.3 Do you think use of flagship birds is an effective way to educate the public about broader conservation issues?

On the whole, key informants agreed that flagship birds can be a useful tool for educating the public and that public education is important for conservation. Charismatic birds or birds with a large range, such as cockatoos, were identified as particularly useful since they can help to engage a large cross-section of the community, which is especially helpful where conservation resources are otherwise limited. As with any education strategy, key informants stressed the importance of tailoring messages to the interests of different groups. For example, cockatoos were described as being a valuable group to involve people in citizen science initiatives, which are deemed essential to effective conservation. One example given was that experiencing live cockatoos up close in presentations works very well to develop bonds of ownership and understanding among audience members. Some informants thought that children may also respond well to visual media, for example the animated film 'Fern Gully: The Last Rainforest' was highlighted as encouraging children in Qld to take greater interest in their natural environment.

However, one key informant advised that although a flagship can be useful for communicating ideas it should not be perceived as an 'over-arching solution' because some sectors of society may be cynical or have their own self-interests:

'For portions of the public I think it's very effective. I guess if you work in industry you meet a lot of people who don't give tuppence about

conservation; they see that as a 'greenie' kind of thing. A lot of people would think our regulatory requirements are an unreasonable burden put upon them. And farmers, for example, you still have that old historic: "Oh they're pests." So you have these historic anachronisms' B-C#5 Academic.

7.2.1.3.4 Would the case study taxon make a good flagship bird for your region?

Several key informants agreed that Baudin's could make a good flagship for forest habitat because it is visible in the forests and most Western Australians would be able to see it there. Emphasising its inextricable bond with Carnaby's, it was proposed that Baudin's could 'ride on the back' of Carnaby's to some extent for public support, but that once people learned how to distinguish between the two species and understood the pressure Baudin's is under (e.g. through the WA Museum's 'Cockatoo Care' program), more would be done to preserve it. Reasons given against using Baudin's as a flagship included inadequate knowledge about its needs and its pest status.

The almost identical appearance of Baudin's and Carnaby's suggested to some key informants that survival of Baudin's is inextricably linked to that of Carnaby's. The money expended on Carnaby's recovery was generally perceived by interviewees to be a positive contribution to the conservation of Baudin's, as long as the two species remained at risk. However, if the Carnaby's population were to recover, it was thought that Baudin's may suffer from the misunderstanding that they are a single species.

The majority of key informants agreed that Carnaby's is already considered suitable as a flagship bird for the region and it is seen as having two major advantages as such. Firstly, Carnaby's has enormous public appeal; it was described with great affection, in terms such as: popular, visible, funny, beautiful, charismatic, interesting and engaging; and it was considered an ideal subject for citizen science initiatives (e.g. the annual 'Great Cocky Count') because anyone can see it in the Perth metropolitan area.

'If ever there was a species that could point the way it's Carnaby's because it's so adaptable, it's so accommodating. Put a bird bath out and it'll splash around in it. Plant a macadamia tree and it'll have lunch there. Carnaby's is actually trying!' C#10 State government.

Secondly, Carnaby's relevance across a large geographic range where many different kinds of people and social groups live means it can be used to raise awareness about several conservation issues with relevance to many sectors of society (e.g. land clearing for urban expansion and habitat protection). One interviewee mentioned that protection of Carnaby's means protection of a suite of other species, especially in the Wheatbelt:

'If the question is: "Why this patch and not another patch?" Carnaby's can help provide an argument for that. Particularly with the IBAs now; some of those are around Carnaby's areas' B-C#1 State government.

To complicate matters, Carnaby's conservation was perceived by some key informants to be a 'bandwagon' for alternative motivations that could even derail conservation initiatives:

'...because (Carnaby's) were the one listed federal species they tended to be what the rallying cry came around... they've already de facto become the emblematic species for loss of bushland in the Perth area... it's a frustration for a lot of industry, local governments, running into what they see as opposition to development and unreasonable burdens. So they have a kind of negative flagship. So, for them the green opposition to development is epitomised in birds... So, you have this weird dichotomy of how the flagship works' B-C#5 Academic.

The Red-tailed Black-cockatoo *Calyptorhynchus banksii* was the only other potential flagship bird species, nominated by three key informants.

7.2.1.3.5 Is the perception of rarity alone sufficient to influence attitudes and behaviour that lead to effective conservation action?"

This question is answered here on the basis of spontaneous comments made during the interviews about 'rarity' and factors important to conservation.

Even though concern was raised about Baudin's relatively low population size, some key informants were of the opinion that population numbers may never have been particularly high. Therefore, the lack of general data about the species' population dynamics and habitat requirements tended to cause more alarm among key informants than the population numbers because it affected their ability to make informed management decisions.

Anxiety was not expressed explicitly for the population size of Carnaby's, but many key informants alluded to anecdotal evidence that Carnaby's no longer 'blacken the sky', as they once did.

Several key informants made direct reference to the many benefits of being able to work with endangered species on a daily basis and in this regard the status of 'rarity' could be said to add value to their role as conservation practitioners.

It is possible to conclude from this that the perception of rarity alone is not driving attitudes and behaviour that lead to effective conservation efforts for Baudin's and Carnaby's.

On the contrary, a large number of other factors influenced how key informants were perceiving chances of conservation success for species recovery. These can be grouped into the following broad categories (in order of frequency of mentions in the interviews):

- types of threat and whether they are perceived to be manageable or not (25 mentions);
- individual and group motivations for participation in conservation action (20);
- type of conservation investment and whether adequate or not (18);
- impact of policy and legislation on conservation objectives (16);
- stakeholder diversity and engagement in conservation action (12);
- adequate knowledge to make informed management decisions (11);
- personal relationship with the species (11);
- status and reasons for listing (7);
- attitudes towards species group (5);
- effective communication of science (5);
- access to adequate resources (4); and
- visibility of the species to the general public (4).

7.2.1.3.6 Summary of values held for the White-tailed Black-cockatoo species

The attitudes expressed by key informants during their interviews about Baudin's and

Carnaby's are summarised and compared in Table 7.7.

Table 7.7: Summary and comparison of attitudes expressed by key informants during their interviews about the Black-cockatoo species, according to the avifaunal attitude categories (ticks indicate attitudes expressed), (n=31).

	Baudin's	Carnaby's
Attitudes		
Aesthetic	\checkmark	\checkmark
Biophysical	\checkmark	\checkmark
Conservation	\checkmark	\checkmark
Ecological	\checkmark	\checkmark
Experiential	\checkmark	\checkmark
Humanistic	\checkmark	\checkmark
Mastery		
Moral	\checkmark	\checkmark
Negative	\checkmark	\checkmark
Spiritual		\checkmark
Symbolic		\checkmark
Utilitarian	\checkmark	\checkmark

7.3 Conclusions

Baudin's and Carnaby's clearly exist within very different social contexts. Overall, there is a diversity of attitudes to both taxa from a range of community sectors but it appears that the experiential attitudes key informants expressed for Carnaby's, as a result of existing in close proximity to humans, correlate with community interest and conservation action, currently absent in Baudin's recovery efforts.

Baudin's pest status significantly hampers recovery efforts for it. Little is known about its requirements but it is perceived to contribute to the ecological history and fabric of the South-West region due to its role as an ecosystem engineer. Baudin's is thought to have the potential to be a flagship species for its forest habitat because of its appealing appearance and behaviour but it has a low public profile beyond the horticultural community which generally perceives it as a threat to their livelihoods. Due to the lack of conservation investment and social interest, the outlook for Baudin's is perceived to be poor.

In Carnaby's favour is its high public profile: its visibility and charisma make it a powerful flagship species so that a multitude of people engage in citizen science and habitat restoration projects. However, Carnaby's prominence in the city is sometimes used against it especially by industry members and local governments who epitomise it as 'green' opposition to development. Since it is considered an adaptable species the conservation outlook for Carnaby's is perceived to be relatively positive.

Mitigation of threats for both species is highly political due to the large number of affected government and industry parties, each of which has potentially conflicting objectives. Some parties see the restrictions placed on their activities as an unreasonable burden. This is a significant problem for Baudin's. Almost all of its recovery team members are government representatives who do not feel it is appropriate to advocate in public about the policies of another government department even when they include threatening processes. In addition, given the lack of knowledge about Baudin's requirements, it is difficult to accurately calculate the threshold for referring potential impacts to the *EPBC Act 1999*, therefore unsustainable logging and removal of nesting habitat continues. In direct contrast, because Carnaby's frequents the Perth metropolitan area, development impacts on Carnaby's readily trigger *EPBC Act 1999* referrals and this has resulted in better policy, coordination and effort to conserve it.

CHAPTER 8: Synthesis of Findings

This chapter answers the study's research questions by summarising and synthesising major results from the survey and case study chapters (Figure 3.1). Firstly, to further understand the phenomenon being studied, findings from the three case studies were compared to identify similarities and differences within and between them and to identify the most important results from the key informant interviews conducted: these results reflect the opinions and knowledge of a select group of people with direct involvement in the conservation of the specific threatened birds studied. Secondly, the most important results from the quantitative surveys have been incorporated where they contribute to answering specific research questions: these results represent the attitudes of members of the public regarding specific statements presented during the surveys. Since the data presented here mostly derive from the valuational systems sections of the case studies, this chapter has a similar structure to that of Sections 5.2, 6.2 and 7.2 and, unless otherwise stated, questions are answered based on the synthesised views of the individual case study key informants interviewed.

8.1 How do Australians value threatened birds?

This section summarises case study key informant attitudes towards native birds and threatened birds then discusses their opinions about whether conservation of threatened birds is important to the Australian public. It also presents main findings from the general public surveys regarding values held by survey respondents for threatened birds and related sociodemographic characteristics.

8.1.1 Which values are held for native threatened birds, how do they compare with those held for native birds in general and what can we learn from this?

Key informant attitudes towards birds were fairly similar across the three case studies (Sections 5.2.1.1; 6.2.1.1; 7.2.1.1), however the attitudes expressed about native birds in general and threatened birds in particular differed somewhat (Table 8.1). Native birds were particularly referred to in terms of experiential, humanistic and biophysical avifaunal attitudes. Attitudes towards native birds were typically framed in positive terms and had associations such as: pleasure, affection and positive nature experiences; engaging behaviour, passion and a connection to childhood or a significant other; and an appreciation for the variety of species and their physical characteristics.

Threatened birds were generally referred to in terms of moral, conservation and humanistic avifaunal attitudes. They tended to be described in positive terms but their threatened status also implied commitment, being associated with personal responsibility, societal accountability and a moral obligation to prevent extinctions. They were seen as useful 'tools' for communicating conservation to the public and engaging people in conservation action; the latter being perceived as helpful for preserving other wildlife species too. Threatened birds were described as useful for representing threatening processes that need to be better controlled to avoid loss of many species but also in terms of frustrations associated with conserving them, such as lack of resources. Key informants described feeling emotional about the loss of bird species and thought that people's fondness for birds would make them want to protect them. Table 8.1 compares key informant attitudes about native birds and threatened birds and gives examples of some of the more commonly expressed comments (see Appendix 8 for the full range of comments).

8.1.1.1 Is conservation of threatened birds important to the Australian public?

Although key informants thought the public is becoming more interested in nature and does not necessarily want threatened birds to become extinct, conservation was largely seen as a special interest. Division of interest in threatened birds may be partly due to negative framing of conservation issues (which likely deters people from paying attention or getting involved), and a perceived climate of self-interest where the public is thought to be more concerned with its own needs than those of threatened birds (Table 8.2). Table 8.1: Examples of key informant statements about native birds and threatened birds based on case study interview results (number of statements shown in brackets where more than one similar statement made; (blank cells indicate no comments were made), (n=74), (Chapters 5-7).

Attitude	Total no. of statements	Statements about native birds	Total no. of statements	Statements about threatened birds
Aesthetic	13	Appreciate their beauty (9); being colourful is an advantage(4)	-	
Biophysical	16	Appreciate variety of species/physical characteristics (5); interesting life histories, e.g. migration (4); diurnal (2), so easier to work on than other wildlife; good research animals (2); abundance; am interested/knowledgeable about birds	6	Interest in breeding; biophysical similarity between species may help me identify how to improve status; interested in rare birds with tiny populations or geographically isolated; interesting behaviour
Conservation	6	Popular group to communicate conservation messages (2); community involvement helps other species; should be studying common declining birds	17	Play special role as useful communication/engagement tool (2); showcase conservation issues to public; represent threatening processes/species that may be lost; lack of resources frustrating; motivate work (3)
Ecological	9	Interested in ecological role (3); common species can help to understand the ecology of a place (2); good research animals; am keen naturalist; useful to learn about disturbance ecology; important part of ecosystem	2	Important due to integral role in complex ecosystems
Experiential	40	Visible (10); enjoy seeing/watching birds (6); obvious/vital part of the landscape/bush/ecosystem (5); easier to detect than other wildlife (3); very accessible (3); have been around birds all my life (2); easy way to interact with environment (2); working with birds has been a	6	Privilege and reward to see in wild; offer opportunities to experience nature in ways others can't; the planet's poorer for every species lost

Attitude	Total no. of statements	Statements about native birds	Total no. of statements	Statements about threatened birds
		great experience/increased my interest (2); audible; always surprising and engaging to see what turns up; plenty of other people to get excited about birds with		
Humanistic	26	Engaging behaviours (5); people are very passionate about/interested in birds (6); fond childhood memories of birds (3); girlfriend/parents/naturalist mentor encouraged interest (3); awe inspiring /charismatic (3); connection with nature/sense of place (2); public relates to birds more easily than other groups, e.g. nocturnal (2)	11	Described emotionally: 'upset' (2), 'empathy' (2); 'passion', 'privilege', people want to protect as like having birds around (2); more important than other wildlife; childhood memory of watching environmental declines
Mastery	6	Like to see, add to list (2); best known wildlife group; contributed significantly to life history knowledge	4	Looking for rarity; people want to see; exciting trying to find them
Moral	3	Everything has a right to exist (2); humans should learn to share; don't like idea that anything is threatened; hate that humans have imposed on anything in the natural environment;	18	Personal responsibility (8)/societal responsibility (6) to conserve species; nothing should go extinct (4); need to keep for future generations; want to 'fight the good fight'; species have intrinsic value
Symbolic	5	Iconic (2); majestic; free; emblematic	1	Good icons for conservation
Utilitarian	2	More research opportunities for birds than other wildlife; benefitted from working with explorer naturalists	6	Makes you consider what is a good investment to preserve (4); we can't escape from self-interest and what we choose to conserve; can use to sell my tours

Synthesis of findings

Table 8.2: Summary of key informant perceptions regarding whether conservation of threatened birds is important to the Australian public based on case study interview results (n=74), (Chapters 5-7).

Case study taxon	Positive perceptions	Negative perceptions
Yellow Chats	Interest groups e.g. birdwatchers, fishermen, landholders can contribute from maintaining habitat to communicating with stakeholders; Individuals can plant bird-friendly gardens, create demand to see particular bird; Key factor is to identify opportunities for awareness raising, engagement that target specific behaviours to be changed, actions to be taken	Widespread lack of awareness of conservation issues, climate of self- interest; The challenge for conservation practitioners of communicating relevant information to the public contributes to this dilemma. Some groups more difficult to engage than others e.g. 'red-necks'
Migratory Parrots	Small section of society, e.g. those engaged in resource management activities, active birdwatchers; Proliferation of nature-based documentaries, magazines and news stories in the Australian media indicate society's growing interest in natural world	Most Australians don't want to see species go extinct, however conservation would not ' <i>rate very highly on their scale of things that</i> <i>are important</i> ' due to lack of awareness, media's influence on people's perceptions, poor public profile of conservation movement, emphasis of legislation on listing species rather than preventing threatening processes
Black-cockatoos	Abundance of different interest groups e.g. people who love birds, birdwatchers, nature tourists; BLA key instigator of community engagement	Little interest in, knowledge of or concern about extent of 'the problem'; other, more pressing, priorities; greater interest in wildlife overseas; Threatened birds sometimes act as vehicles for other causes, or are obscured by conflicting interests across government departments; People don't necessarily want species to go extinct, but make decisions that put themselves first; Negative perception of conservationists as 'rabid greenies' prevents people getting involved

8.1.2 How do public values held for threatened birds relate to sociodemographic characteristics?

According to findings from the general public surveys, conservation of threatened birds is important to survey respondents (Figure 4.6). Two patterns of opinions emerged. Most respondents (average of 85%) expressed emotional and moral concern about threatened birds (humanistic, conservation and moral-obligation attitudes), were curious about them (combination of biophysical and ecological attitudes) and would appreciate seeing them in the wild (experiential and mastery attitudes). Few (average of 11%) felt the interests of humans come before those of threatened birds (utilitarian, negative and aesthetic attitudes) or would delegate responsibility for them to government (moral-government attitude). Importantly, there appears to be much stronger and more widespread public concern for threatened birds than key informants generally thought (Section 8.1.1.1). Further, the relative level of support for different types of avifaunal attitudes is similar to that described below for key informants (Figures 8.2; 8.3).

Two broad and distinct value orientations regarding threatened birds existed within the survey samples: avicentrism, which tends to place the needs of threatened birds before those of humans; and anthropocentrism, which tends to place the needs of humans before threatened birds. Avicentrism was associated with curiosity, experiential, humanistic, moral-obligation, mastery and conservation attitudes. Avicentrism was more evident among those who were female, older and tertiary-educated. Anthropocentrism was associated with attitudes regarding personal disconnection from nature and willingness to delegate to government responsibility for the survival of non-human species. This was reflected by agreement with statements correlating with negative, aesthetic, utilitarian and moral-government attitudes. Anthropocentrism was more evident among those who were male, younger and non-tertiary educated. These findings were generally consistent with previous studies conducted in Australia on attitudes towards wildlife and the environment (e.g. Aslin 1996; Fitzgibbon & Jones 2006; Franklin 2007a; Franklin & White 2001; Miller 2000).

8.2 Who is involved in threatened bird conservation and how do they communicate their values?

The questions addressed in this section are answered based on findings from case study key informant interviews and desktop analyses (Chapters 5 to 7).

8.2.1 Who are the stakeholders involved in threatened bird conservation, what are their values and whose values count?

8.2.1.1 Who are the stakeholders?

Apart from those interviewed (Section 8.2.1.1.6), stakeholders included additional groups or individuals identified by key informants (Sections 8.2.1.1.1 to 8.2.1.1.5). It became clear from key informants' comments that the extent to which stakeholders contributed to recovery efforts varied greatly. Five roles were identified. 'Public champions' took a leading role in conducting conservation activities for a taxon; those making a major contribution to a recovery effort can be called a 'Supporter'; affected parties not contributing directly to recovery efforts can be referred to as 'Affected but Inactive'; those conducting potentially detrimental activities can be called 'Disadvantageous' and those contributing in other ways to increasing awareness and knowledge of a taxon can be called 'Other'. All known stakeholders for each taxon are presented in Appendix 9 according to their perceived contribution to conservation efforts and stakeholder role. These roles are further described below.

8.2.1.1.1 Public champions

The role of public champions in contributing to overall success of conservation efforts appeared to be very important for driving investment in a taxon. For instance, Saunders' government-sponsored, decades-long study of a population of Carnaby's at Coomallo Creek has provided substantial baseline data on the species and driven community interest so that now a relatively large number of researchers are able to explore more specialised aspects of its biology and ecology (DSEWPaC 2013f). In contrast, Baudin's has three public champions but they have been working on the species for a short time and with minimal resources (Chapman 2008).

8.2.1.1.2 Supporters

All six case study taxa had 'Supporter' stakeholders. 'Supporters' are crucial to the recovery process. However, taxa receiving the least conservation investment and social interest tended to have the smallest number and diversity of Supporters. Supporters contributed to conservation efforts via diverse strategies including advocacy, community engagement, captive breeding, funding, governance, mitigation of threats, habitat management, rehabilitation, population surveys, planning decisions and research.

8.2.1.1.3 Affected but Inactive

Numerous stakeholders were identified as 'Affected but Inactive' for all case study taxa. Many of these groups and individuals could be significant contributors to recovery efforts were they considered in management strategies and effectively engaged. For example, recreational fishermen could assist managers of the Alligator Rivers subspecies by recording sightings when fishing in remote parts of its wetland habitat.

8.2.1.1.4 Disadvantageous

This group is called 'Disadvantageous' because its members contributed to threatening processes which either directly or unintentionally affected threatened bird populations, although the attitudes of these stakeholders can negatively or positively affect recovery efforts. For instance, some stakeholders adversely affected by restrictions placed on development activities that may impact on Carnaby's habitat did not believe Carnaby's was in decline nor that it warranted special consideration, due to the presence of large flocks inhabiting Perth. Therefore, many of these stakeholders were perceived by key informants to feel aggrieved by seemingly unnecessary burdens placed on them by the conservation process. Conversely, key informants said some resource extraction companies which may contribute to threatening processes also actively support conservation efforts, for example through research activities that promote effective habitat revegetation (e.g. Alcoa 2012).

8.2.1.1.5 Others

Finally, 'Other' kinds of stakeholders were identified as contributing to awareness and knowledge of threatened bird taxa in various ways, depending on the particular context of the
taxon concerned. This included the public and involved activities such as: research, population monitoring, tourism or political lobbying.

Figure 8.1 compares the level and type of contribution made by stakeholders to the six case study taxa recovery efforts, as identified by key informants and desktop analyses.

8.2.1.1.6 Key informant interviews

A summary of the key informants interviewed across the three case studies is shown in Table 8.3. The types of individuals and organisations they represented differed somewhat between case studies. Notably, they reflect the overall importance of state government conservation agencies, academics, industry, private consultants, the media, ENGOs, volunteers and landholders to the threatened bird conservation process in general. A diversity of other kinds of stakeholders was involved for specific taxa according to factors such as types of tenure over which the taxon's range extends, jurisdictional governance structures, and conservation actions required. Some key informants were interviewed about more than one taxon.



Figure 8.1: Comparison of the number of stakeholders contributing to recovery efforts for individual case study taxa by stakeholder role based on case study interview results (n=74) and desktop analyses (Chapters 5-7). Each tick represents an individual stakeholder or stakeholder group; a cross indicates no stakeholders were identified.

Table 8.3: Summary of key informants interviewed in the case studies and the interests they represented (total number interviewed shown in brackets in the first column; ticks indicate stakeholder types interviewed for individual taxa), (n=74), (Chapters 5-7).

	Yellow (Migratory	Parrots	Black-cockatoos			
Sector	Alligator Rivers	Capricorn	OBP	Swift	Baudin's	Carnaby's	
Government							
Commonwealt	:h (3) 🗸		\checkmark	\checkmark	\checkmark	\checkmark	
State (22)	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	
CMA (1)			\checkmark				
Restoration (1))					\checkmark	
Scientific							
Academic (10)		\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	
Scientific (4)			\checkmark	\checkmark	\checkmark	\checkmark	
Private							
Industry (5)		√	\checkmark	\checkmark	\checkmark	\checkmark	
Consultant (4)			\checkmark	\checkmark	\checkmark	\checkmark	
Media (3)			\checkmark	\checkmark	\checkmark	\checkmark	
Tour operator	(1) 🗸						
Non-government							
ENGO (10)		√	\checkmark	\checkmark	\checkmark	\checkmark	
Rehabilitation	(1)				\checkmark	\checkmark	
Public							
Volunteer (5)			\checkmark	\checkmark	\checkmark	\checkmark	
Landholder (3)		\checkmark	\checkmark	\checkmark		\checkmark	
Birdwatcher (1	.) 🗸						

8.2.1.2 What are stakeholders' values?

Attitudes expressed within key informant interviews were analysed by calculating the percentage of individual interviews coded by each attitude node and identifying which attitudes were most commonly expressed by individual key informants (Section 3.4.4.3). This revealed fairly consistent patterns in attitudes when key informants were grouped by case study (Figure 8.2). Unsurprisingly, given the topic of the interviews and the overall framing of the study, conservation attitudes were the most strongly expressed by key informants. It is more interesting to consider that the experiential, moral, ecological, biophysical and humanistic attitudes appear to be contributing to key informants' perceptions about conservation. Some differences can be seen between case studies reflecting the particular social contexts within

which the key informants were operating. The relative level of support for different types of avifaunal attitudes is similar to that described above for survey respondents (Section 8.1.2).

Ecological and mastery attitudes were expressed most frequently by Yellow Chat key informants, humanistic attitudes were expressed most frequently by Migratory Parrot key informants, and moral attitudes were expressed most frequently by Black-cockatoo key informants.



Figure 8.2: Comparison of average percentages and standard errors of the occurrence of each attitude identified in individual key informant interviews for all interview questions by interviewees representing individual case studies (n=74), (Chapters 5-7).

This analysis was applied a second time to the key informant interviews with similar types of key informants grouped into the five societal sectors they represented: government, non-government, scientific, public and private. Thus, overall expression of individual attitudes could be compared across the different stakeholder groups represented by the key informants (Section 3.4.4.3). Key informants from some stakeholder groups expressed particular attitudes more strongly than other groups, reflecting the shared motivations, experiences and interests of individual stakeholders within the group (Figure 8.3). Interestingly, there was most consistency across stakeholder groups with regard to moral attitudes. Government and scientific stakeholders expressed particular attitudes more than others. Scientific stakeholders expressed biophysical attitudes much more than others. Non-government

stakeholders expressed humanistic attitudes slightly more strongly than others. Finally, public stakeholders expressed mastery and negative attitudes most strongly.



Figure 8.3: Comparison of average percentages and standard errors of the occurrence of each attitude identified in individual key informant interviews for all interview questions by interviewees representing major stakeholder groups (n=74), (Chapters 5-7).

8.2.1.3 Whose values count?

8.2.1.3.1 Stakeholders perceived to have most influence on threatened bird conservation

A number of stakeholders were identified by key informants as having most influence on the threatened bird conservation process and this gives some insight into whose values count most from the perspective of informants who were closely involved in conservation efforts (Table 8.4). It is not possible to rank the different stakeholders in order of influence because their respective influence differs depending on the context. Rather, Table 8.4 shows the combination of key stakeholders thought to have the power to significantly affect threatened bird conservation efforts; it also summarises key informants' perceptions about the kinds of influence different stakeholders have. In each case, a stakeholder's impact can be positive or negative subject to the motivations of important individual representatives and depending on how their representations are received by other decision-makers.

Table 8.4: Summary of stakeholders identified by key informants as having most influence
on conservation of threatened birds and their perceived major influence as described by
key informants, in order of perceived importance based on case study interview results
(n=74), (Chapters 5-7).

Sector	Influential agent	Perceived influence		
Government	Politicians, ministers	Approve funding, legislation, policy decisions;		
		likely driven by short term populism rather than		
		strategic view; may place human interests before		
		threatened birds		
	Commonwealth	Statutory, legislative responsibility to manage		
	Government (DoE)	environment; provide funding, recovery planning		
		support to state agencies when EPBC Act		
		triggered		
	State government	Statutory, legislative responsibility to manage		
	environment agencies	threatened species; contribute scientific		
		knowledge; develop recovery plans, coordinate		
		recovery teams, administer recovery efforts;		
		passionate employees		
	Local government	Responsible for local planning decisions		
	agencies			
	National parks	Manage critical habitats		
	authorities	-		
	Landowner incentive	Habitat restoration		
	schemes			
	(e.g. Land for Wildlife)			
Non-	BirdLife Australia	High profile, non-partisan, effective lobby group;		
government		community engagement, impetus for conserving		
		birds; love birds, desire to preserve; staff,		
		volunteers conduct valuable research,		
		monitoring; members can influence policy,		
		contribute to community projects; increase public		
		interest in particular species		
	Field naturalist groups	Educate, raise awareness		
	Funding bodies	Decide what is important, where to target		
		resources		
Scientific	Scientists	Contribute scientific knowledge, educate, raise		
		awareness		
	Universities	Administer funding, research support		
Public	General public	Participate in conservation activities; lobby, drive		
		demand for conservation outcomes		
	Landholders	Manage habitat		
	School teachers	Educate, raise awareness		
Private	Land developers	Landclearing for urban development		
	Resource extractors	Landclearing for mining, timber extraction		
	Commercial fishing	Impact on food resources for birds, birds tangled		
		in fishing lines		
	Media	Influence public opinion		

Government stakeholders

According to key informants, individual politicians and government ministers exerted greatest influence due to their power to make critical policy, legislative and funding decisions. Commonwealth and state government conservation agencies were described as having significant influence because of their statutory and legislative responsibilities for threatened bird conservation. Some key informants said that local government agencies could contribute much more positively to conservation efforts by implementing more sustainable planning decisions. It was suggested that national parks authorities could manage critical habitat more effectively than at present. Government funded incentive programs, such as 'Land for Wildlife', were described as important for assisting private landholders to maintain and restore vital habitat.

Non-government stakeholders

BLA was seen by key informants as being almost as influential as state governments. BLA is perceived to play an important advocacy role for bird conservation in general and for particular threatened taxa through its recovery projects. It was seen as delivering significant lobbying and research outcomes via its dedicated staff, volunteers and conservation-oriented membership. Other community groups, such as field naturalists, were described as playing a key role in fostering general environmental education and awareness-raising.

Scientific stakeholders

Key informants pointed out that individuals representing the scientific community can be highly influential if they choose to work on or champion a taxon. By investing resources in a taxon's conservation, scientists may facilitate specialist research, funding opportunities and landholder engagement. Universities were identified as often facilitating funding and driving research activities.

Private stakeholders

Development and resource extraction companies were seen as being highly influential, particularly if they have close connections with decision-makers. Their activities can detrimentally affect threatened species habitat. However, individuals in these companies were also described as able to direct research and investment towards species conservation, as in the case of ICI (Australia) Pty Ltd supporting research into the impacts of a proposed development on OBP habitat. The media act as a conduit for disseminating information about threatened species. Positive examples included natural history broadcast presenters. However, the news media were viewed less positively.

Public stakeholders

Key informants described the public as being able to influence policy and decision-making by applying pressure on all levels of government and industry to make sure decisions are made in the interests of the environment. Landholders in particular were identified as an important subset of the community since they can potentially maintain and restore vital habitat. However, in both these cases better education about and awareness of conservation issues was said to be the key to more effective engagement. In the opinion of key informants, the public typically has little understanding of the relevant scientific details and landholders often do not know which taxa inhabit their properties. Consequently, other influential individuals include teachers who were said to drive environmental education programs.

8.2.2 What information do stakeholders rely upon?

The case study desktop analyses (Sections 5.1; 6.1; 7.1) highlighted the most common kinds of documents conveying information about threatened birds and their conservation. To gather relevant scientific information about a taxon, most threatened bird key stakeholders were likely to rely on documents such as: peer-reviewed journal articles, scientific reports, Commonwealth SPRAT taxa profiles and taxa recovery plans. Three such documents per taxon were content analysed (Section 3.4.3.4), i.e. 18 documents in total as follows:

- Alligator Rivers Yellow Chat: Armstrong 2004; DSEWPaC 2013a; Woinarski & Armstrong 2006;
- Capricorn Yellow Chat: DSEWPaC 2013b; Houston & Melzer 2008; Jaensch et al. 2004;
- Orange-bellied Parrot: DSEWPaC 2013c; OBPRT 2006; Weston et al. 2012;
- Swift Parrot: DSEWPaC 2013d; Saunders et al. 2007; Saunders & Tzaros 2011;
- Baudin's Black-cockatoo: Chapman 2008; DSEWPaC 2013e; Johnstone & Kirkby 2008;
- Carnaby's Black-cockatoo: DEC 2012; DSEWPaC 2013f; Saunders & Ingram 1998.

The content analysis revealed that these documents tended to be written by experts representing different knowledge collectives consisting of individuals with different roles and institutional objectives, for example Commonwealth or state government agencies, ENGOs or academic institutions. Through the process of formalising their thoughts in writing, the authors intended to proclaim a purpose based on their particular knowledge about and attitudes towards conserving the case study taxa to advance the practices of other expert conservationists (Hammersley & Atkinson 2007). The language in these documents is generally formal and the style is scientific in nature, including use of technical terms. Mostly, these documents included biological and ecological information and tended to explore avian biology, ecology and conservation with the assumption that readers have some understanding of these concepts. Only one study explored the human dimensions of conservation and this was for the OBP (Weston et al. 2012). Overall, the conservation literature tended to convey biophysical, conservation and ecological attitudes. Where values were assigned to the case study taxa, either by the study authors, on behalf of other people or the institutions represented by the authors, only instrumental values were assigned. Other sources of information about threatened birds that key stakeholders may refer to include websites of birding ENGOs, such as BLA.

8.2.3 What messages do stakeholders communicate to the public?

Key informants were asked to describe what message they would give to the general public about the importance of conserving threatened birds. Between them, stakeholders mentioned 110 different reasons they would give to the general public about the importance of conserving threatened birds. The majority of these messages were framed positively. Two thirds of messages expressed conservation, moral and ecological attitudes (Table 8.5). Just over half of the conservation messages were motivational, i.e. they recommended individual or group action, while most of the remainder were issue related. Just one emphasised the consequences of biodiversity loss. Moral messages were mostly framed in terms of 'responsibility', 'duty' and 'obligation' at a personal or government level to care for or preserve other species. Some emphasised the benefit to future generations; three stressed weighty considerations such as failure to act resulting in loss of species. Most ecological messages stressed the instrumental

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value of birds to the natural environment. Only one message suggested how the public could contribute to habitat protection. The majority of other messages expressed experiential, biophysical and utilitarian attitudes. They underlined the instrumental value of birds and threatened birds to humans. Five messages highlighted the intrinsic value of birds.

Table 8.5: Summary of messages communicated by key informants about the importance of conserving threatened birds, by attitude category and frequency of mentions, based on case study interview results (presented in decreasing frequency of occurrence; number of statements shown in brackets where more than one similar statement made), (n=74), (Chapters 5-7).

	Total no.	
	of	
Attitude Conservation	statements 30	Statements Importance of individual action (7); importance of protecting habitat (7); actions individuals can take (4); need for financial support (3); threats to focal taxon and birds in general (3); conservation is possible (2); importance of saving taxon (2); promote awareness of status, consequences of losing biodiversity; role of town planners in maintaining urban habitat
Moral	25	Responsibility to care for other species (5); everything is important and has a role to play (4); personal responsibility through own actions (4); duty to preserve species for future generations (3); local ownership of species (e.g. endemic to area) (3); failure to act may result in loss of species (3); federal government responsibility through legislation; obligation to share key resources with other species; species' have a right to exist
Ecological	24	Importance of the taxon's role in an ecosystem (16); Birds are indicators of environmental health (6); Importance of protecting the taxon's habitat or life support system; provide as much habitat as possible (gardens, new developments)
Experiential	11	World would be poorer to humans without diversity (6); wonder and enjoyment of the natural world (5)
Utilitarian	9	Benefit to human life (6); human dependence on biodiversity for health, well-being (2); benefits (e.g. tourism)
Biophysical	6	Uniqueness of the taxon (to an area) (5); all species are fascinating in their own right
Aesthetic	2	Some taxa have attractive physical characteristics (e.g. appearance or song) (2)
Humanistic	1	Contribution of birds to 'sense of place'
Mastery	1	Tempting birdwatchers by exploiting rarity value
Spiritual	1	Highlighting cultural significance to Traditional Owners

8.3 Do the values held for particular species of threatened birds affect the success of strategies to conserve them?

This section begins (Section 8.3.1) with a synthesis of key informant attitudes about strategies used to conserve the case study taxa based on findings presented in Sections 5.2.1.3; 6.2.1.3 and 7.2.1.3. This is followed by a synthesis of findings about how being framed as iconic, flagship or rare threatened birds may influence recovery efforts for a case study taxon (Sections 8.3.2 to 8.3.6).

Section 8.3.7 summarises and compares the values held for the six case study taxa as expressed by key informants throughout their interviews. Section 8.3.8 discusses the perceived success of conservation efforts for the case study taxa in light of these values and attitudes.

8.3.1 Which values are held for particular species of threatened birds?

8.3.1.1 How did you get involved with the case study taxon?

Key informants mostly became involved with a case study taxon due to awareness of and feelings of concern about its plight. Awareness either arose due to personal experience with the taxon or the taxon's high public profile as a result of being involved in controversial events (Figure 8.4). The opposite was true for the Alligator Rivers Yellow Chat; a lack of general awareness of, and knowledge about, the chat has apparently severely hampered stakeholder involvement in its recovery efforts. None of the key informants had ever encountered the taxon and those who were acting to conserve it did so as part of their broader role rather than from personal motivation to protect it.

8.3.1.2 What is most important about conservation of the case study taxa?

Key informants identified protection of critical habitat as the most urgent action required for most of the six taxa (Figure 8.5). To achieve this was said to require targeted research, specifically a better understanding of biological and ecological requirements, causes of population decline and threat management strategies. The importance of research was highlighted by OBP key informants who asserted that efforts could have been directed more effectively had government funding not been restricted to specific types of activities. They thought improved stakeholder relationships would allow better flow of information and coordination of effort, since differing attitudes about conservation priorities can be a hindrance. They also thought moral imperatives drive efforts to some extent regarding society's responsibility to prevent species from disappearing but this is balanced with a need to justify investment.



Figure 8.4: Summary of stakeholder involvement in conservation of the case study taxa based on case study interview results (n=74), (Chapters 5-7).



Figure 8.5: Summary of conservation priorities for case study taxa based on case study interview results (n=74), (Chapters 5-7).

8.3.1.3 Do you personally believe that conservation efforts for the case study taxon will succeed or fail?

Conservation success was typically interpreted by key informants as persistence over the long term, while failure was interpreted to mean the opposite. Overall, they expected populations of the Alligator Rivers and Capricorn Yellow Chats and the OBP to persist, but for very different reasons. They thought the future for both the Swift Parrot and Baudin's seems uncertain (Figure 8.6). The anticipated extinction of Baudin's is attributed to a lack of biological and ecological data on which to base good management decisions and competing social values regarding use of its forest habitat.



Figure 8.6: Summary of attitudes towards conservation success or failure of case study taxa based on case study interview results (n=74), (Chapters 5-7).

8.3.1.4 What would it mean to you if conservation efforts were to succeed or fail?

Emotional attachments to the case study taxa were evident among key informants, particularly those working to conserve the two Migratory Parrot taxa and the two Black-cockatoo taxa. This became most apparent when key informants who suggested that conservation efforts may fail were asked what it would mean to them. They used highly emotive and personal terms such as 'sadness', 'grief', 'anger', 'disappointment', 'tragedy', 'upset', 'frustration' and 'moral outrage'. These feelings revealed both a sense of personal responsibility and the responsibility of society as a whole to avoid the loss of any species. They also signalled that they thought conservation policies and processes are flawed. Conversely, key informants

anticipating conservation success voiced highly positive feelings such as 'great satisfaction and pride', 'enormous relief' and 'extremely happy'. This suggests that they thought success would only result from significant effort but that the effort was worthwhile. The Alligator Rivers Yellow Chat was not described in affective terms at all which is likely related to the fact that none of the key informants has ever seen one in the wild and it has no public champion to encourage interest.

8.3.1.5 Is it important to you that a population of the case study taxon exists in the wild?

All key informants agreed that existence in the wild is the main priority for their taxon. Wild populations were valued both intrinsically for their own significance and instrumentally in terms of benefits to ecosystems and people (Figure 8.7). Some disparaged the idea of a taxon surviving only in captivity since it no longer fulfils a functional ecological role in this situation.

Regarding intrinsic value, key informants tended to phrase their responses in terms of belief in a taxon's intrinsic value or right to exist, for example:

'I believe that species have an intrinsic right to survive humans... I believe in the intrinsic value of biodiversity for the sake of having it there' C#7 Birding ENGO.

'I guess I believe in conservation *per se*. I don't believe in triage. I don't believe in letting anything go. I think they've all got intrinsic value. We don't necessarily understand their ecological roles so maintaining species is a good thing to be doing' B-C#3 State government.

Some key informants simultaneously alluded to the significance of intrinsic and instrumental values when discussing the importance of conserving their case study taxon:

'...their (the OBP's) intrinsic value and their value to people. It's both things. The one goes with the other in a sense but it is both those things that are important' OBP#11 State government.

'...of course everything is important and everything is valid and has a right to exist but... (Capricorn Yellow Chats) actually fill a niche that no other bird fills, which is interesting' YC-C#1 Academic. Interestingly, intrinsic value was not expressed at all in the key documents analysed (Section

8.2.2). Instead the documents analysed emphasised only instrumental values.



Figure 8.7: Summary of perceived importance of a wild population of case study taxa based on case study interview results (n=74) (Chapters 5-7).

8.3.1.6 Can the local community influence conservation of threatened bird taxa?

According to key informants, community attitudes towards a threatened bird taxon may greatly influence conservation outcomes and correlate with community capacity to engage with recovery efforts (Figure 8.8). It seems that a 'vicious circle' effect is in place whereby those taxa which are unfamiliar, of little interest to society, or considered pests by some, tend to receive less community support than those that are encountered by a broad cross-section of the community, have a positive public profile or are promoted as flagships. Greater community support across different sectors of society may lead to more varied opportunities for public engagement, which may generate more effective conservation outcomes.



Figure 8.8: Summary of key informant perceptions about potential for the local community to influence conservation efforts for the case study taxa based on case study interview results (n=74), (Chapters 5-7).

8.3.1.7 Does one of the case study taxa receive more in terms of conservation effort than the other?

The matched pairs of taxa within each case study were selected because it was perceived they received different levels of conservation investment and this was the case. Conservation investment was measured by the existence of a formal recovery program and major projects, number of publications, amount of funding invested and number and diversity of relevant stakeholders (Sections 5.1.2.2; 6.1.2.2; 7.1.2.2). Overall, the OBP, Swift Parrot and Carnaby's received the greatest conservation investment of the six taxa. Key informants from the Migratory Parrot and Black-cockatoo case studies were also asked their opinions about whether one case study taxa was perceived to receive greater conservation investment than the other and why they thought this to be the case (Sections 6.2.1.3.1; 7.2.1.3.1). Reasons given were directly related to social and economic interest as well as the significant contribution of research champions who gathered basic biological and ecological data and drove interest in the taxa (Figure 8.9). Yellow Chat key informants were not asked this question as there was insufficient overlap in recovery effort to enable them to comment on this particular issue.

	Yellow Chats Caprico	Capricorn better supported by greater diversity of social, economic interests than Alligator Rivers						
Social and economic interest	Both parrots affected by land-use planning but Swift had more positive public profile than OBP. Swift widely promoted as flagship, conservation efforts engage volunteers across tenures, geographic Migratory Parrots range							
	Loss of habitat was threat to both cockatoos, both affected by conflicting interests but Baudin's affected by illegal shooting							
			Yellow Chats	Capricorn received greater conservation investment than Allig	ator Rivers which received little			
Socio-economic and Conservation investment Migratory Parrots OBP received greater conservation investment for longer, better studied, better funded than Swift. Both had diverse range of stakeholders but OBP stakeholders acted more cohesively								
of the case study taxa Black-cockatoos Black-c								
	Yellow Chats	Capricorn reco champion, sup community to	eived greater conserva oport of national birdwa engage in conservatio	tion investment than Alligator Rivers due to contribution of resea atching group, higher public profile, greater opportunities for n efforts	arch			
Conservation investment imbala	nce Migratory Parrots	OBP received and biological,	much greater conserva ecological characteris	tion investment than Swift due to contribution of research cham tics which drive strong social interest	pion			
	Black-cockatoos	Carnaby's received far greater conservation investment than Baudin's in terms of a research champion, Black-cockatoos dedicated recovery team, plan, research, funding, expert groups, social interest and stakeholder diversity						

Synthesis of findings

Figure 8.9: Summary of social and economic interest, conservation investment and conservation investment imbalance in case study taxa based on case study interview results (n=74) and desktop analyses (Chapter 5-7).

8.3.2 Which significant characteristics lead to a species' status as a key or iconic threatened species in terms of political decision-making, significant events and social attitudes?

Iconic status is one of several potential framings for wildlife-related work focusing on single species (Section 1.3.8.3). This section summarises findings from case study desktop analyses (Sections 5.1; 6.1; 7.1) and key informant interviews (Sections 5.2.1.3; 6.2.1.3; 7.2.1.3) about which characteristics in terms of political decision-making, significant events, social attitudes and physical attributes lead to the social construction of some threatened bird taxa as iconic species.

8.3.2.1 Political decision-making, significant events and social attitudes

Based on key informant interviews and desktop analyses, social attitudes towards the nature of events that initiated a taxon's original threatened listing or subsequent claims appear to have contributed to it becoming an iconic species or not. This can influence the amount of conservation investment it subsequently receives.

Four of the case study taxa provide good examples of how 'newsworthiness' can affect conservation action. For instance, the OBP was originally identified as 'at risk' by a team of researchers representing birdwatchers, industry and a range of state government conservation agencies, commissioned by ICI (Australia) Pty Ltd to investigate potential impacts of a controversial industrial development on a critical part of its habitat (OBPRT 1998). Similarly, the plight of the Swift Parrot was brought to national attention when it became the focus of a controversial court case to prevent logging in Wielangta forest (Allchin, Kirkpatrick & Kriwoken 2013; Austin & Douglas 2008). Carnaby's has been the focus of numerous campaigns run by a range of ENGOs who use it as a flagship to prevent loss of habitat in the rapidly developing Perth metropolitan area and beyond (BA 2005; WWF-Australia 2009). The Capricorn Yellow Chat benefited significantly from the discovery in 2004 of two small mainland populations where it was previously thought to be extinct, as it became highly accessible for scientists to study (Houston *et al.* 2004a; Jaensch *et al.* 2004). Some key informants claimed that this boost to population numbers has contributed more to the subspecies' likely survival than any particular conservation action. The conservation of these four taxa has subsequently been supported by

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organisations from various sectors of the community including BLA recovery projects (BA 2011; BLA 2012; BLA 2013b, c).

The Alligator Rivers Yellow Chat and Baudin's have apparently not been so fortunate in terms of newsworthiness. Rather than benefiting from a controversial or transformative event, they have either remained in relative obscurity to face an uncertain fate, as in the case of the chat, or as with Baudin's, continue to suffer from the consequences of political decisions and societal values that have long placed human needs before habitat protection.

8.3.2.2 Iconic characteristics

All six case study taxa were described to varying degrees as iconic taxa and tended to be appreciated for their instrumental value to humans. Typically, iconic birds were described in terms similar to those used to describe flagship species, but were more strongly linked to humanistic attitudes than flagship species (Table 8.6; Figure 8.10).

Table 8.6: Summary of key informant statements about characteristics of iconic birds based on case study interview results (in decreasing frequency of occurrence), (n=74), (Chapters 5-7).

	No. of						
Attitude	statements	Iconic characteristic					
Humanistic	8	Well-loved; charismatic; engaging; strongly associated with a particular place or time; interesting folklore in a region; sympathy for the species' plight; capture the public's imagination; important social or cultural values to community					
Aesthetic	4	Large; noisy; visible; colourful					
Biophysical	2	Unique; well studied					
Ecological	2	Draw attention to requirements of a habitat or other species; well studied					
Conservation	1	Draw attention to requirements of other threatened species					
Experiential	1	Location					
Monetary	1	Previous community investment					
Utilitarian	1	Help people understand importance of birds to own quality of life					

8.3.3 Is the use of flagship threatened birds conducive to educating the public about broader conservation issues and if so which species are most effective?

Key informants considered flagship birds to be an effective tool for educating the public about conservation issues and public education is deemed important for improving conservation outcomes. However, flagships are not an 'over-arching' solution since some sectors of society may not be receptive due to cynicism or self-interest.

8.3.4 Would the case study taxon make a good flagship bird for your region?

The most effective flagship birds were described as being charismatic and appealing to a target audience, representing a range of habitats and being able to be used to convey complex messages simply. Also, the communication strategy around the flagship must have clear objectives from the outset for the species and the ecosystem as well as for the sponsors supporting its promotion (Figure 8.10). Of the six case study taxa, Carnaby's and the Swift Parrot were deemed the most effective flagships for conservation, ecological, experiential, humanistic and biophysical reasons. Of the two, Carnaby's appeared to generate a greater amount of enthusiasm and affection among key informants because of its highly appealing 'personality'. Only the Alligator Rivers Yellow Chat was not generally considered a suitable flagship threatened bird due to a lack of awareness about it, its restricted range and difficulty in encountering it in the wild.

In terms of other potential avian flagship species, the most commonly nominated by key informants were the Red-tailed Black-cockatoo, mentioned by three key informants, and the Gouldian Finch, mentioned by two. Others were nominated by one individual each and represent a range of different avifaunal families, including: two estrildid finches: Beautiful Firetail and Crimson Finch; two waders: Hooded Plover and the Plains-wanderer; Emu; Fortyspotted Pardalote; Malleefowl; Masked Owl; and Wedge-tailed Eagle.



Figure 8.10: Summary of preferred characteristics of flagship threatened birds grouped by avifaunal attitude categories, based on case study interview results (n=74), (Chapters 5-7).

8.3.5 Is the perception of rarity alone sufficient to influence attitudes and behaviour that lead to effective conservation action?

Four of the case study taxa were discussed in terms relating to rarity (Figure 8.11). On the whole, rarity was perceived positively, however key informants tended to be aware of many competing rare taxa and generally felt a responsibility to protect all biota. A prime example of this is the Alligator Rivers Yellow Chat which is perceived to be rare due to its small population and limited distribution, yet is of little social interest.



Figure 8.11: Summary of relationships between rarity and conservation action, based on case study interviews (n=74), (Chapters 5-7).

Among many key informants, rarity was considered important for driving attitudes and behaviour that lead to conservation action. The formal identification of rare or threatened species is now enshrined in conservation planning processes and associated legislation and regulations at different jurisdictional levels (Section 1.3.6). A couple of key informants said rarity can lead to conservation action since there is a process whereby people, governments and countries can be held accountable. However, this is dependent on there being sufficient knowledge about the taxon to trigger the legislation and the legislation being sufficiently contemporary to effectively deal with modern threats.

Rarity can make a taxon more attractive to wildlife managers, birdwatchers and the broader community, if the taxon is readily accessible in the wild and this in turn may generate funding and community support. Rare species can be used to motivate people to conservation action. Rarity can also challenge societal priorities regarding whether it is acceptable to drive species to extinction. Rarity is a fundamental aspect of OBP conservation and a number of key informants pointed to the species' recent rapid population decline and critically small numbers as incentives for personal or institutional involvement because of the sense of urgency inherent in the species' plight. However, it remains to be seen if conservation actions have been effective or not. Rarity was often described via experiential, utilitarian and mastery attitudes. Some key informants felt highly privileged or excited to work on rare taxa. Two felt their roles are special due to the many benefits of being able to work with endangered species on a daily basis and experiencing nature in a way that others cannot. In this regard the status of rarity for the taxa they are working on could be said to add value to their role as conservation practitioners. Others appreciated the opportunity to advance knowledge about a rare or little known taxon. Similarly, elusive rare birds may present a particularly worthy challenge to those who wish to record them for survey purposes or just see them for themselves. Further, the challenges associated with maintaining volunteer interest in a rare taxon that may be on the brink of extinction are unique and require special consideration.

However, rarity does not drive conservation action alone. On the contrary, a large number of other factors influenced how Black-cockatoo key informants perceived chances of success for species recovery actions, including issues relating to: threats; motivations for participating in conservation action; conservation investment; and the impact of policy and legislation on conservation objectives.

8.3.6 Which characteristics of rare species are important to their conservation?

Several characteristics of rare species were described as being important to their conservation (Table 8.7). These predominantly related to biophysical attributes and conservation status. Many characteristics are similar to those perceived to be advantageous in flagship species.

Table 8.7: Summary of key informant statements about characteristics of rare birds deemed important to their conservation, based on case study interview results according to their corresponding attitude category (in decreasing frequency of occurrence) (n=74), (Chapters 5-7).

	No. of	
Attitude	statements	Rarity characteristic
Biophysical	9	Only endemic bird species around; disconnection from nominate subspecies; breeding success in wild; fascinating behaviour, life history; full species; genetic viability; global rarity; unique; little current knowledge, possibility of contributing to it
Conservation	9	Status; believed lost; range overlaps with similarly endangered species; community interest, ability to participate; critically small population size; extent, type of threats; fast / sudden rate of decline; precariousness of survival; trajectory of actions
Mastery	5	Elusiveness; challenge in building knowledge; search for something unusual; thrill of the hunt; very hard to detect
Aesthetic	4	Physical beauty; brightly coloured; large size
Humanistic	3	Connection to place; empathy for plight; charismatic; unusual name
Ecological	3	Represents habitat / has niche role; represents variety of endangered habitats, species; little current knowledge, possibility of contributing to it
Experiential	2	Challenging, unique experience to encounter in wild; exists in special location
Moral	2	Government has duty to protect; local to own area, so personal responsibility
Symbolic	1	Represents plight of other species or habitats

8.3.7 Summary of values held for particular species of threatened birds

Attitudes expressed by key informants during their interviews about the case study taxa (Sections 5.2.1; 6.2.1; 7.2.1) are summarised and compared in Table 8.8. As well as expressing their own attitudes, key informants sometimes reported perceptions they believed were held by people other than themselves, for example the public or particular sectors of society. The range and number of attitude types held within society appears to increase with society's collective experience with a taxon. This is exemplified well when one considers the highly contrasting social contexts within which the Alligator Rivers Yellow Chat and the OBP, Swift Parrot and Carnaby's exist.

That is, the Alligator Rivers Yellow Chat was the least studied and understood of the six case study taxa and had the smallest range of attitude types expressed for it by key informants. Interest in the taxon was restricted to its biological and ecological characteristics, a moral concern for its survival and a desire to see it in the wild. This small range of values was held by few people at a local scale.

The opposite was true for the OBP, Swift Parrot and Carnaby's; between them, of the six taxa studied, these three taxa had undergone the longest-running recovery efforts, received the greatest levels of conservation investment and had the most diverse range of stakeholders involved (Appendix 9). The OBP, Swift Parrot and Carnaby's also had the greatest range and number of attitude types expressed for them by key informants, which is likely related to the diversity of key informants interviewed. The high public profiles of these taxa suggest some of these attitudes were held at a local, regional or national scale. Also important were the variety of contexts within which conservation efforts for these taxa were discussed and potential for community involvement in their conservation.

5-7).						
	Yellow Chats		Migratory Parrots		Black-cockatoos	
	Alligator Rivers	Capricorn	OBP	Swift	Baudin's	Carnaby's
Attitudes						
Aesthetic		\checkmark	\checkmark	\checkmark	\checkmark	\checkmark
Biophysical		\checkmark	\checkmark	\checkmark	\checkmark	\checkmark
Conservation	ע י	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark
Ecological	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark

Experiential Humanistic Mastery Moral Negative Spiritual Symbolic

Utilitarian

Table 8.8: Summary and comparison of attitudes expressed by key informants during their interviews about the case study taxa (ticks indicate attitudes expressed), (n=74), (Chapters 5-7).

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8.3.8 Perceived relative success of conservation efforts for the case study taxa

8.3.8.1 Yellow Chats

Very little has been conducted in the way of conservation effort for the Alligator Rivers Yellow Chat due to lack of recent data to suggest greater effort is required; a consequence of its low conservation priority and overall obscurity to wildlife managers and the community. Values expressed about it focused around the need for better data about its biology and ecology. Without contrary evidence, its population is deemed stable.

The Capricorn Yellow Chat is the object of much higher social interest than the Alligator Rivers subspecies. Key informants expressed a relatively broad range of attitudes about it, including aesthetic, humanistic and experiential attitudes, which were positively correlated with the motivation to conserve it. It is promoted as a flagship and valued for its rarity, both of which generate social capital and conservation investment. The discovery of accessible populations of the subspecies acted as a catalyst for much of the current conservation effort. Recovery efforts appear to receive adequate funding and are supported by diverse, effectively engaged stakeholders. The population is considered stable and conservation efforts are deemed relatively successful.

8.3.8.2 Migratory Parrots

The OBP is highly valued for its rarity and has attracted significant conservation investment from all levels of government and the community, especially volunteers and landholders within its winter habitat range. It is considered by those working to conserve it as being a suitable flagship species for its saltmarsh habitat but this has limited public appeal. Diverse types of stakeholders were interviewed about the OBP and they expressed a broad range of attitudes about it. Nevertheless, key informant opinions were divided about the appropriateness of investing in protection of the OBP's mainland habitat and in developing an insurance population in captivity instead of ensuring the preservation of a breeding population in Tasmania. There is an imbalance in power relations between different types of stakeholders which seems to have negatively impacted on likelihood of recovery effort success (Section 9.4.2). Key informants anticipate the OBP's wild population will become functionally extinct within the next few years but the captive-bred population is expected to prevent extinction of the species (BLA 2013b; Martin *et al.* 2012; OBPRT 2010, 2012, 2013).

The Swift Parrot is considered an iconic, flagship species and is highly valued for its rarity. A broad range of attitudes were expressed for it and its recovery effort is supported by a diverse range of stakeholders, funding and community projects. According to some key informants, the historic conflict over the logging of Tasmania's old growth forests (Austin & Douglas 2008) means tensions exist between government and non-government stakeholders in Tasmania and this appears to detrimentally affect recovery efforts (Section 9.4.2). Conservation efforts are perceived to be on a positive trajectory but its long-term survival is uncertain due to its unpredictable foraging requirements and the complexity of managing seemingly intractable threats to its habitat across a large range.

8.3.8.3 White-tailed Black-cockatoos

Although Baudin's is considered an iconic species by some, it has a low public profile, few active stakeholders, receives minimal conservation investment and suffers from being confused with Carnaby's. Little is known about the taxon since relatively few people are working on it and lack of knowledge about its requirements means basic data about its biology and ecology is still being gathered. Key informants expressed a fairly broad range of attitudes about Baudin's but management of the taxon is significantly influenced by it being perceived as a pest by many orchardists and the fact that key affected government parties have conflicting interests regarding conservation of its forest habitat. Baudin's population is declining and its outlook for survival is poor.

Key informants representing a variety of interests were interviewed about Carnaby's and they expressed a wide range of attitudes about the taxon. Carnaby's was described as a highly charismatic, iconic species and an ideal flagship species to represent its woodland habitat. It receives significant conservation and research investment from a broad cross-section of stakeholder types. Because Carnaby's comes into Perth metropolitan area, *EPBC Act 1999* triggers are much clearer than for Baudin's resulting in greater awareness, better policy and greater effort to conserve it. A relatively large number of people are working on Carnaby's and because it has been studied over a number of decades researchers are able to explore

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specialised aspects of its biology and ecology which leads to better understanding of its requirements. Carnaby's long-term conservation outlook is positive, but this is credited more to the adaptability of the taxon than to its recovery effort since its management is highly political and threats to its habitat involve complex social processes which are not readily changed.

8.4 Conclusions

This chapter has summarised and synthesised the findings from the three case studies and the public surveys to provide answers to the study's research questions. Several major themes emerged. A clear pattern of avifaunal attitudes was associated with threatened birds and their conservation which informs consideration of the ways in which threatened birds are socially constructed in Australia, and this is discussed in the next chapter. A polarisation of attitudes among Australians towards threatened birds was identified which could lead to conflict in certain situations. That threatened bird conservation is often framed in terms of morality, intrinsic value, empathy and loss may have implications for communication and engagement strategies. So could observations of the strong relationship between the type of knowledge held about threatened birds and which stakeholders are currently engaged in the decision-making process. Finally, the attitudes of individuals and society towards individual threatened bird taxa almost certainly influence the level of conservation investment and social interest they receive. The next chapter explores and discusses these themes in the context of the broader theoretical framework within which this research is situated. **CHAPTER 9: Discussion of Findings**

The previous chapter presented a summary and synthesis of findings from Chapters 4 to 7. Several key themes emerged from the synthesis of case study and survey results and these are discussed below.

9.1 Attitudes associated with threatened birds and their conservation

Key informants generally expressed conservation, experiential, moral, ecological, biophysical and humanistic attitudes about threatened birds. Key informants expressed these kinds of attitudes about individual case study taxa as well but sometimes also held mastery or symbolic attitudes or believed in their intrinsic value. Key informants' attitudes towards some individual threatened bird taxa may be more strongly underpinned by values than others, and some taxa may mobilise a greater range of values than others.

The survey findings demonstrated that respondents also held humanistic, conservation, moral-obligation, curiosity (combination of biophysical and ecological) and experiential attitudes most strongly regarding threatened birds. Further, two main value orientations were identified: avicentrism and anthropocentrism, indicating two diverging patterns of attitudes towards threatened birds may exist among members of the public (Section 9.2).

Key informants and survey respondents therefore held similar kinds of avifaunal attitudes towards threatened birds although the relative frequency with which each attitude was expressed differed between the two groups, mainly regarding humanistic and experiential attitudes (Figure 9.1). For key informants, experiencing threatened species in their natural environment was linked to empathy for their plight, whereas survey respondents would feel upset if a threatened bird became extinct but were less interested in experiencing it in the wild. The overall importance of these six avifaunal attitudes and their implications for threatened bird conservation are consistent with other studies on attitudes towards wildlife in Australia and the USA (e.g. Aslin 1996; Fitzgibbon & Jones 2006; Franklin & White 2001; Kellert 1993; Miller 2000, 2003).

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Figure 9.1: Comparison of key informant and survey respondent attitudes towards threatened birds and their conservation with attitudes shown in descending order of frequency expressed by the two groups. Arrows highlight differences in frequency of expression of experiential and humanistic attitudes.

9.2 Avicentrism and anthropocentrism

A major conclusion from the surveys was the existence of two value orientations towards threatened birds among the general public: avicentrism and anthropocentrism; and these were associated with different socio-demographic characteristics. These findings were generally consistent with many other studies, in Australia and elsewhere (Aslin 1996; Blaikie 1992; Clayton & Opotow 2003; Franklin 2007a; Herzog 2007; Kals, Schumacher & Montada 1999; Kellert 1993; Kellert & Berry 1987; Milfont 2012; Miller 2000; Teel, Dayer & Bright 2006; Teel & Manfredo 2009; Tranter 1999; Tranter & Pakulski 1998; Zelezny, Chua & Aldrich 2000).

Those people expressing higher levels of avicentrism tended to be older, more highly educated women. Such women could be prioritised for recruitment into birding organisations since older, tertiary educated people tend to be more 'active' members of environmental groups (Tranter 2010) and birdwatchers (Moore, Scott & Moore 2008; Sali, Kuehn & Zhang 2008). Those expressing higher levels of anthropocentrism, who tended to be younger, less well-educated men, are not necessarily against conservation of threatened birds *per se*. Rather they tend to put the needs of humans before those of threatened birds. According to other Australian studies on attitudes towards wildlife (e.g. Aslin 1996), these characteristics tend to be associated with members of consumptive use groups or those living in rural locations (Section 2.3.1). However, more research needs to be conducted among those with anthropocentric characteristics to better understand their values, attitudes and behaviours as the relationship

with nature is complex. This is exemplified by the links between this group and the aesthetic attitudinal statement which suggests an appreciation of at least some aspects of nature.

Levels of avicentrism and anthropocentrism may be linked to individual differences in value systems which tend to be generated by variations in personal experiences (Rokeach 1973). These differences can be expected as a result of an individual's upbringing and life experiences, degree of internalisation of cultural and institutional values, identification with gender roles, political identification and religious upbringing (Rokeach 1973) (Section 2.1). Differing attitudes towards threatened birds may relate to the existence of different cultural value orientations (Section 2.1.2). To illustrate, the inclination to put the needs of threatened birds before those of humans can be seen as reflecting the post-materialist values identified by Inglehart, thought to arise from the presence of economic and physical security in one's formative years (Inglehart 1977, cited in Schwartz 2006; Inglehart 1990). Inglehart contends that a post-materialist worldview is strengthening in advanced industrial societies, that shows great concern for the meaning of life and places renewed emphasis on the sacred in nature (Inglehart 1990). Studies in Australia show that post-materialists tend to be more concerned about environmental issues and more likely to join environmental groups than are materialists (Tranter & Pakulski 1998). Post-materialist values also reflect the 'affective autonomy' cultural value orientation identified in Australia by Schwartz (2006). Conversely, the inclination to put the needs of humans before those of threatened birds supports Schwartz's identification of the 'mastery' cultural value orientation in Australia, which encourages active self-assertion to master, direct, and change the natural and social environment to attain group or personal goals (Schwartz 2006) (Figure 2.1).

The existence of these two avifaunal value orientations suggests the potential for conflict where decisions are made that prioritise the needs of humans over those of threatened birds, or vice versa. Conflicting views about nature can create powerful tensions at all scales of human society: between neighbours, community sectors, between the public and wildlife managers, between political parties and between countries. Case study findings demonstrate that conflicting values tend to become crystallised when particular issues arise, for example, over competing land-use activities. Similar polarisation of societal attitudes towards wildlife and

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nature has been reported from North America (Kellert 1980; Teel & Manfredo 2009) (Sections 2.2.1; 2.2.2).

Figure 9.2 demonstrates the possible relationship between cultural value orientations, such as affective autonomy and mastery; group values, such as post-materialism and materialism; socio-demographic factors, such as gender, age and education; and avicentric and anthropocentric value orientations.



Figure 9.2: Possible relationship between cultural values, group values, socio-demographic characteristics and avicentric and anthropocentric value orientations, showing avicentric and anthropocentric attitudes in descending order of importance. Boxes and bubbles at right contain data derived from the quantitative surveys (Chapter 4).

9.3 Framing and values

In this study, non-threatened and threatened birds were valued in different ways, according to how they were socially constructed. Broadly speaking, non-threatened birds were seen by key informants to represent pleasant and beneficial associations with nature and as a means to educate people about ecology. Threatened birds were framed in ways that seemed to symbolise more serious concerns such as morality, e.g. personal and social responsibility; loss; and a need to understand threatening processes. They were also regarded as a means for delivering broadscale conservation messages (Appendix 8). It was agreed there is a moral obligation to conserve threatened birds and both the public and government were deemed responsible for their conservation. Hence, key informants were likely to emphasise rational arguments expressing conservation, ecological and moral attitudes to convey the importance of conserving threatened birds to the public rather than affective arguments, which some consider to be more persuasive (Milton 2002) (Sections 8.2.3; 9.3.3). Further, conservation literature tends to convey biophysical, conservation and ecological attitudes and is intended to communicate these attitudes to an expert audience rather than the broader community, thus serving to maintain the power relationship between conservation experts and others (Berger & Luckmann 2011) (Sections 8.2.2; 9.4.1).

This study identified four major themes regarding the ways threatened birds were framed by key informants: morality, belief, empathy and loss, and these are discussed below. Ways in which the framing of threatened bird conservation could more effectively incorporate values that may appeal at both a policy-maker and public interest level were also identified.

9.3.1 Morality

In this study, excluding attitudes about conservation, moral attitudes were most consistently recorded across all five stakeholder groups in key informant interviews (Figure 8.3). When comparing key informant attitudes towards native birds in general and threatened birds in particular (Table 8.1 and Appendix 8), moral attitudes were expressed much more commonly for threatened birds (19 comments) than for native birds (3 comments), and moral attitudes were expressed most commonly overall for threatened birds than any other kind of attitude.
Most comments conveyed implicit assumptions about there being a responsibility to conserve threatened species, either because of the rights of the individual species to live or the rights of future generations to experience them.

Many key informants stressed the need for individuals to take responsibility for conserving threatened birds, suggesting they are uncertain about whether Australians recognise a direct link between their own behaviour and the processes that threaten bird species, or whether they perceive such a link in ethical terms. This seems to be borne out by the attitude of those expressing higher levels of anthropocentrism in the survey responses, who would delegate responsibility for threatened bird conservation to government (Section 4.1.3.2). However, 89% of survey respondents saw the connection between human behaviour in general and threatening processes, 86% agreed there is a moral obligation to protect threatened birds and 61% disagreed that government is more responsible for a threatened bird's survival than themselves (Section 4.1.2). Similarly, many would put the needs of threatened birds before their own, particularly those respondents expressing higher levels of avicentrism (Section 4.1.3.1).

Moral attitudes regarding responsibility to conserve threatened birds reflect beliefs about appropriate modes of individual and societal behaviour. They may be a natural and appropriate response to pangs of conscience and feelings of guilt for wrongdoing since they can be related to broader moral values which are the product of social life (Rokeach 1973). 'Human life is - and has to be - a moral life precisely because it is a social life... morals are socially agreed upon values relating to conduct... and are the products of social interaction as embodied in culture' (Kluckhohn 1962, p.388). Further: '...there seems to be little point in one person's behaving morally unless others also behave morally' (Rokeach 1973, p.9).

Thus, perhaps key informants believe conserving threatened birds is a socially and morally appropriate goal (Section 1.3.6.1). Giving species moral rights can lead to social expectations and norms about them; transgressing these expectations and norms may bring feelings of guilt

and shame⁵⁷ to the transgressors (Brandt & Reyna 2011). According to Kluckhohn (1962, p.388): ""Conscience" may be said to be the last residuum of instinctive behaviour in man...'

Key informants alluded to feelings of guilt about threatened bird extinctions in comments like 'the idea of things being extinct is abhorrent to me if it's our fault', 'Australia's poor track record for extinctions' and 'I want to "fight the good fight" (Appendix 8).

The scientific discipline of conservation biology has been described as 'mission-driven' and dedicated to the moral and political challenge of stopping biodiversity loss (Meine, Soulé & Noss 2006; Sandbrook *et al.* 2013). However, the moral positioning of conservation biology has led to this discipline being described by some as 'an excuse for bad science' because of the wariness with which many scientists are thought to view attempts to connect values to scientific investigations (Toussaint 2005). Soulé (1985) asserted that ethical norms are a genuine part of conservation biology and the principal *Priority for Action of Australia's Biodiversity Conservation Strategy 2010-2030* conveys a moral preference when it says 'All Australians must take responsibility for biodiversity conservation' (NRMMC 2010, p.33). The important point here is to distinguish between where science ends and where personal and institutional values begin, so it is clear when individuals are acting as scientists or as advocates, otherwise public goodwill towards science may be detrimentally affected (Chan 2008).

9.3.2 Belief

A third of key informants expressed their belief in the rights of threatened birds to exist which equates to belief in their intrinsic value. Hence, a belief in the intrinsic value of biological entities appears to be highly significant in motivating some key informants to conserve threatened birds.

Conservation biologists discussing the pros and cons of conservation triage often express the importance of a species' intrinsic value (Toussaint 2005): '...intrinsic value acknowledges the integrity of all species and ecosystems, protects them from short-term human whims, and gives conservation the ethical status it deserves' (Maguire & Justus 2008, p.910). However, stressing a species' intrinsic value does not tend to muster the attention needed to translate concern into

⁵⁷ Considered by some as the 'traditional moral emotions' (Brandt & Reyna 2011).

conservation action because of various trade-offs required in contemporary conservation decision-making, competing social demands (Kellert 1985; Maguire & Justus 2008) and the difficulties associated with assessing a species' intrinsic value (Dietz, Fitzgerald & Shwom 2005; Justus *et al.* 2009; Maguire & Justus 2008) (Section 1.3.8.1.1). Nevertheless, some conservationists, such as McCauley, strongly believe that: 'Nature conservation must be framed as a moral issue and argued as such to policy-makers, who are just as accustomed to making decisions based on morality as on finances' (McCauley 2006, p.28).

Clearly, the debate about whether arguing for the intrinsic value of non-human species, as compared with instrumental values, is the best ethical basis for conserving nature will continue for some time, but it appears that arguing for intrinsic value could be used by wildlife managers as a moral leverage to persuade some policy-makers and funding bodies to more highly prioritise threatened bird conservation than at present and motivate individuals to act to conserve biodiversity.

9.3.3 Empathy

A tension between feeling empathy for threatened birds and the need to rationalise conservation efforts was strongly evident in this study. Of all avifaunal attitude types, experiential attitudes were the most consistently and frequently expressed during key informant interviews when reviewed across case studies (excluding conservation attitudes) (Figure 8.2). Further, almost all key informants got involved in conservation because their direct experiences with nature inspired a passion to protect it (Sections 5.2.1.1.1; 6.2.1.1.1; 7.2.1.1.1). Several key informants expressed humanistic attitudes towards threatened birds (Appendix 8), such as feelings of empathy, sadness and concern, and wanted to help them because they are 'in trouble'. Yet, when it came to considering how they would communicate the importance of conserving threatened birds to the Australian public, rational arguments reflecting conservation, moral and ecological attitudes abounded. Affective arguments were largely absent (Section 8.2.3). According to Mulligan (2001), rational arguments for conservation alienate people and may reinforce a widespread view that conservation is for experts and fanatics (Section 1.3.5).

Toussaint (2005) identified a similar dichotomy among some Australian conservation biologists while Noss (1996) has argued that the empathy gained during field research is an essential component of conservation biology (Noss 1996) (Section 1.3.8.1). It has also been suggested that the emotions people experience in relation to other entities provide affective clues as to the perceived moral status of those entities (Brandt & Reyna 2011), reinforcing the idea there is a relationship between key informants' experience of and empathy for threatened birds and the high moral standing they afford threatened bird taxa.

Almost eight in ten survey respondents (77%) agreed with the experiential attitude statement 'If I saw an endangered bird, I might feel privileged or spiritually uplifted.' It is likely that many Australians already have some level of emotional affinity with birds, for example due to the various different ways in which they actively engage with birds as living organisms on a regular basis (Section 1.2). Indeed, Miller's (2000) study found the Victorian public expressed a strong emotional attachment to, and love for, animals. Kellert (1980) expressed concern about the degree of emotion that Americans feel about animals over and above any intellectual consideration since, among other things, it may result in more basic considerations of ecological relationships between wildlife and natural habitats being overlooked. He also found that ecological value was often assigned to wildlife by experts but rarely assigned by other people (Kellert & Clark 1991). However, 83% of survey respondents in this study wanted to learn more about threatened birds, indicating they were curious about them (Section 4.1.2).

People often know more about common species in and around their area than species restricted to more remote areas, and knowledge of threatened birds among the general public tends to be poor (Wilson & Tisdell 2005). However, support for conserving a wider range of threatened bird taxa grows when people are supplied with basic information about them (Wilson & Tisdell 2005). Miller (2000) suggested that Victorian wildlife managers could strengthen the public's interest in wildlife through interactive education programs and increase people's interest in conservation by focusing on emotional attachment to native species. The findings in this research support such a strategy.

If stakeholders do not convey empathy for what they wish to conserve as an argument for conserving wildlife, they may be missing a vital opportunity to inspire Australians to participate

in conservation action: 'The motivating force of an argument... lies in its emotional impact, and we need to recognize this, as well as its logic, if we are to understand how it moves people to action' (Milton 2002, p.95). Conservation messages could be framed in ways that arouse feelings: 'An argument only motivates when it induces feelings – satisfaction, pleasure, excitement, interest, anger, distress. If it generates no feeling at all it will not persuade' (Milton 2002, p.100).

9.3.4 Loss

A consequence of being emotionally attached to nature is the feeling of loss when it is lost or degraded. Key informants who anticipated that conservation efforts for their taxon may fail described their feelings about it in highly emotive and personal terms such as 'sadness', 'grief', 'anger', 'disappointment', 'tragedy', 'upset', 'frustration' and 'moral outrage'.

Anger is thought to be the typical response to violations of justice and fairness (Brandt & Reyna 2011). It is likely that expressions of negative emotions reveal the strength of feeling key informants have developed for the threatened bird taxa they are working to conserve and the high moral status they may place on those taxa as a result (Brandt & Reyna 2011). Many of these emotions can also be related to acute stress experiences and possibly to the irreconcilable melancholia dubbed 'solastalgia'⁵⁸ (Albrecht 2005; Albrecht *et al.* 2007; Fraser *et al.* 2013). In this study, many key informants described birds as contributing to a 'sense of place' and many spoke of having developed a special relationship with the threatened taxon they were working on and its habitat. Here, the term solastalgia may explain the melancholia key informants associated with the loss of bird species from both imposed place transition (place pathology) and powerlessness (environmental injustice).

In a way, this sense of loss was strengthened for several key informants who thought that the public would not know or care if a threatened bird were to become extinct. As observed by Fraser and colleagues (2013, p.2): 'Perceptions that their in-group status as environmentalists

⁵⁸ Albrecht originally coined the term 'solastalgia' to describe 'the specific form of melancholia connected to lack of solace and intense desolation' that people may feel 'from both imposed place transition (place pathology) and powerlessness (environmental injustice)' (Albrecht 2005, p.44). Since 2005, the term solastalgia has been applied in many meaningful ways, such as in academic and artistic contexts (Albrecht 2012).

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separates them from larger society or the communities where they work can also engender feelings of isolation or the sense that their work is unwanted.' Yet, 90% of public survey respondents in this study agreed that they might become upset if a bird became extinct. This indicates widespread concern for species loss and is an important point to acknowledge. Clearly, there is a misconception by key informants about the strength of feeling the general public may hold for threatened birds. This finding also raises the question about whose role it is to bear the costs of their loss, or equally, to bear the costs of their conservation. Rather than being due to lack of empathy, the disparity between public attitudes towards the loss of species and their involvement in conservation action may be due to scant awareness about threatened birds and what they might do to help conserve them, as well as social norms and structural barriers that deter conservationists and the public from collaborating more on creative solutions.

9.3.5 Effective framing

Environmental issues can be more effectively framed by communicating at the level of values and by framing issues in terms of moral values (Lakoff 2010). The research findings indicated there is a strong link between empathy for wildlife and moral justification for preventing extinctions, and key informants demonstrated that people who positively experience wildlife in its natural environment are likely to want it preserved. Key informants also said that conservation failure and the loss of species carries a very high and barely recognised emotional burden for those deemed responsible.

The research suggests that public messages about threatened birds could be framed in broadly moral terms, including references to intrinsic value, depending on the overall context. Messages could be tailored to emphasise personal or government responsibility according to the perceived levels of avicentrism or anthropocentrism within target audiences. Additionally, it appears that with appropriate affective framing, other values could be expressed, including experiential and humanistic attitudes, which were important to both key informants and survey respondents. In this way, those working to conserve threatened birds could be more explicit about their own attitudes and values, while the values and attitudes of others could also be included in conservation framing and in this way, those who do not share an appreciation for biodiversity may begin to value it for themselves (Chan 2008). Further, expressing the full range

of values associated with conserving threatened bird species could assist with developing more effective frames to capture some of the complex social landscape within which threatened bird conservation operates and help wildlife managers develop conservation strategies that appeal at both a public interest and policy-maker level.

9.4 Relationship between knowledge and stakeholder engagement

Key informants stressed the importance of more individuals taking part in the conservation process and emphasised the benefits of working with large stakeholder networks. Survey respondents strongly supported threatened bird conservation. However, the case studies identified numerous potential stakeholder groups not actively engaged in conservation efforts for the case study taxa. There are several reasons for this which may be traced to knowledge and values.

9.4.1 'Ownership' of recovery efforts

Typically, the stakeholders most commonly engaged in conservation efforts for the case study taxa were experts and non-experts representing diverse institutional, scientific and individual interests from state government conservation agencies, scientists, industry, private consultants, the media, ENGOs, volunteers and landholders. Other stakeholders perceived by key informants to be highly influential included politicians and government ministers, local government agencies, managers of critical habitat, funding bodies and educators. Between them, these stakeholders belong to all four knowledge systems described by Aslin and Brown (2004): local, specialised, strategic and integrative (Section 1.3.7) and each type of stakeholder may hold one or more types of knowledge depending on their individual life experiences.

Stakeholders may become involved in conservation efforts at many different stages of the recovery process and at many different levels of formality and legitimacy. For instance, the participation of some stakeholders is required by regulation, e.g. representatives of state government conservation agencies on threatened bird recovery teams, or some stakeholders may identify themselves as concerned parties and become involved in this way. The legitimacy, reasonableness and urgency of stakeholder concerns can often spark between- and within-

group conflict due to 'moral exclusion' (Opotow & Weiss 2000). Recovery programs may involve stakeholders belonging to all or some of the four knowledge systems. Wildlife managers need to be aware of, and compensate for, the fact that people belonging to one knowledge system may reject the knowledge of the others (Aslin & Brown 2004) (Section 1.3.7).

This section discusses some of the advantages and disadvantages implicit in the ownership of threatened bird conservation efforts by representatives of the government, birdwatchers, industry and the public.

9.4.1.1 Government

Although some environmental problems may initially be detected by members of the public or of special interest groups, e.g. birdwatchers or landholders, typically the general public does not tend to have the expertise or resources to identify new problems or to verify their significance, therefore environmental problems often tend to originate in the realm of science (Hannigan 2006). This is so for four of the six case study taxa examined here, whereby scientists representing state government conservation agencies identified a problem affecting the taxon's survival; distinguished it from other problems; determined the scientific, technical, moral or legal basis of the need for conservation intervention; and developed a process of ameliorative action (Hannigan 2006). However, research scientists can be handicapped by a combination of scholarly caution, excessive use of technical jargon and inexperience in handling the media (Hannigan 2006). There are also constraints on public advocacy by government employees and many scientists are reluctant to explicitly advocate value or policy positions (Chan 2008). The prominence of state government scientists in managing recovery efforts can politicise threat mitigation processes for a taxon because approaches to threats taken by public officials need to reflect the views of the elected government, particularly those of more senior officials within the government's internal hierarchy. Also, other government departments with conflicting objectives often hold values that may be incompatible with achieving conservation objectives (Section 1.3.6). This is an example of institutional dissonance (Festinger 1962) and was particularly true in the case of Baudin's and Carnaby's due to the differing interests and responsibilities of individual affected government departments (Sections 7.2.1.2; 7.3).

Further, according to key informants, politicians and government ministers sometimes intervene in recovery efforts and can detrimentally affect the achievement of conservation objectives, for example preventing the Baudin's recovery team from publishing modelling data regarding the effects of illegal shooting on the persistence of Baudin's populations. This type of *ad hoc* intervention may be partly a result of a 'fragmented policy discourse' whereby 'the environment' is perceived as just another special interest, and within the policy community there is insufficient systemic perspective or holistic thinking to solve shared environmental challenges (Leiserowitz & Fernandez 2008) or develop effective environmental frames (Section 9.3). It may also be due to an imbalance of power and respect weighted towards greater government representation in decision-making processes than non-government representation, amplified by 'top-down' decision-making protocols (Mattson, Karl & Clark 2012).

9.4.1.2 Birdwatchers

Birds in Australia, as in many other countries, are often highly valued by society and have unsolicited political power held for them in trust by interest groups (Czech, Krausman & Borkhataria 1998) such as BirdLife Australia, which may in part advocate values that are shared by wider society. Directing and maintaining the public's attention typically falls to organisations such as BLA. This means a claim can lie fallow until a lobby group or individual comes along to champion the taxon's conservation efforts (Hannigan 2006).

Recovery strategies developed for the case study taxa exemplify this possibility. The Alligator Rivers Yellow Chat was identified as endangered by participants in BLA's Atlas of Australian Birds but despite BLA's original involvement, the birdwatching community has not contributed explicitly to ongoing conservation efforts for the chat, probably because there has been no local birding organisation to support it. Rather, its conservation has primarily been the formal responsibility of various NT Government conservation agency scientists who have apparently not attempted to engage the broader community in the recovery process. A similar situation existed with Baudin's. Consequently, both had the least diverse range of stakeholders involved in their conservation and both received the least conservation investment of the six taxa studied here. The opposite was true for the other four taxa, all of which were supported by BLA recovery projects (BA 2011; BLA 2012; BLA 2013b, c). Indeed, prior to the 2013 Australian

Federal Election, BirdLife Capricornia highlighted the Capricorn Yellow Chat in a public campaign calling for all political parties to protect Australia's most threatened birds (Gladstone Observer 2013).

When asked to consider who has most influence on threatened bird conservation in Australia, key informants perceived BLA to be almost as influential as government and described it as possibly the most powerful non-government organisation driving threatened bird conservation and policy in Australia (Section 8.2.1.3). Key informants identified BLA as a significant source of highly skilled and dedicated staff and volunteers who contribute vital research and engage members of the public through various citizen science programs. The case studies indicated that BLA's support for particular species enhances their prospects for successful conservation outcomes. Even so, the organisation's 25,000 strong supporter base equates to around 0.1% of the Australian population. Hence, it clearly does not represent the interests of all sectors of Australian society. Australian birdwatchers tend to be of either gender but are typically older-aged, well educated and affluent (Jones & Buckley 2001). Among other things, BLA could play a very important role in engaging a broader cross-section of the community in birdwatching and volunteering activities if it developed outreach programs which appeal to more diverse socio-demographic and multicultural sectors of society than at present. Representing more diverse cultural interests could further strengthen its lobbying power.

9.4.1.3 Industry

Key informants viewed the private sector, including development and resource extraction companies, as being highly influential, particularly if they have close connections with decisionmakers and can adversely affect threatened species habitat (Section 8.2.1.3). Simultaneously, some indicated that an individual within a company can direct research and investment towards species conservation, as in the case of ICI (Australia) Pty Ltd supporting research into the impacts of its proposed development on OBP habitat in the 1970s (OBPRT 1998).

The media act as a conduit for disseminating information about threatened species and a large number of newspaper articles about birds examined here focus on conservation and ecological issues (Section 3.2.1). However, the news media were not viewed very positively by key informants because they have portrayed some threatened bird species, such as the OBP,

negatively (Section 6.1.3.1). Further, the media also needs to respond to a 24 hour news-cycle and volatile 'zeitgeists' that shape newsworthiness and reporting can be constrained by a proprietor's or media group's political persuasion which may be influenced by the established political norms of the readership. For example, the newspaper publisher News Corp. has recently been accused of 'overwhelmingly misleading' the public with regard to its portrayals of climate science (Huertas & Adler 2012).

9.4.1.4 Public

The public elects the government, public money is used to fund conservation efforts and the public must often cooperate with any restrictions that may be imposed by conservation programs. Therefore the general public is an important stakeholder in threatened bird conservation. However, key informants suggested that the broader public is not interested in threatened bird conservation, mainly due to a lack of widespread awareness of conservation issues. They surmised that interest is limited to members of special interest groups such as birdwatchers, nature-based tourists and those already engaged in natural resource management activities (e.g. conservation volunteers or citizen scientists) (Section 8.1.1.1). The survey findings indicated there was greater widespread concern expressed among respondents than key informants might have anticipated (Section 8.1.2).

Australians often act locally to preserve places and species they consider important and in some cases are prepared to moderate their behaviour for the sake of threatened species (Section 1.3.8.2). This could indicate that conservation is now a part of mainstream political culture in Australia. Attitudinal convergence on conservation issues may be occurring across different sectors of society, suggesting that, as a political issue, conservation is becoming 'routinised'; it has entered the conventional political arena and been appropriated by the major parties, and environmental curricula are more commonplace in schools and universities than previously (Tranter 1999, 2010). It may be that concern for threatened birds is more widespread than key informants thought, but that engagement in conservation occurs most when desired outcomes are directly relevant to particular individuals.

Although changeovers of ownership of private land are frequent and can lead to permanent loss of biodiversity values (Allchin, Kirkpatrick & Kriwoken 2013), private landholders can

contribute significantly to recovery efforts and all four case study taxa supported by BLA recovery projects included landholders in their conservation strategies (BA 2011; BLA 2012; BLA 2013b, c). The three landholders interviewed in this study were simultaneously farming their land and acting as what some call 'natural conservationists' (Burgess, Clark & Harrison 2000). Meanwhile, a relative decline in agriculture and changing lifestyle preferences are driving population change in peri-urban⁵⁹ areas (Gill, Klepeis & Chisholm 2010). On the one hand, this may be contributing to urbanising human populations and the effects of physical separation on the world views of those who relocate to cities (Section 2.1.1.2). On the other, a major consequence is the diversification of landowner characteristics and attitudes towards environmental stewardship in peri-urban areas (Gill, Klepeis & Chisholm 2010). This has implications for habitat management programs, such as those coordinated by BLA. The local knowledge, experience and dedication landowners offer is likely to be of significant benefit to habitat management programs for threatened birds. But, to be effective, programs will probably need to cater for diverse landowner characteristics, knowledge and attitudes towards stewardship.

9.4.2 Conflicting values, trust and knowledge

When major stakeholders have differing aims for recovery efforts it can significantly hamper successful outcomes if their values and objectives are not compatible (Inkpen & Currall 2004). A good example is regarding two key informants involved in Swift Parrot conservation in Tasmania, representing an ENGO and a state government conservation agency. A conflict between these stakeholders over ownership of the recovery process was symptomatic of differing institutional values in regard to conservation objectives. This conflict appears detrimental to the Tasmanian recovery effort because a mutual distrust based on opposing beliefs and agendas was said to exist. If trust between stakeholders is weak, it can be hard to realise the positive effects of collaborative environmental management (Morris & Owens 2013) (Section 1.3.7.1).

⁵⁹ Rural areas that are accessible from urban centres (Gill, Klepeis & Chisholm 2010).

Similarly, conflicting opinions among OBP key informants, particularly regarding the objective of the captive bred population and the taking of founder birds from the wild, signalled ambiguities regarding authority and accountability and imbalances of power and respect among recovery team members (Mattson, Karl & Clark 2012). Criticism of OBP recovery efforts by key informants who were not recovery team members provide further evidence of an imbalance in power relations between different types of stakeholders. For example, the links between the interests and desired outcomes of key informants on the recovery team were strong and therefore took precedence over the key informants representing other types of stakeholders who held fragmented interests and diverse values. According to Mattson and colleagues (2012), a lack of attention to power and respect issues can be plausibly traced to shortcomings in the paradigm of scientific management because, in this case, the interests of the OBP recovery team members could be easily measured and monetised. This contrasts sharply with the interests of the less powerful, non-recovery team member stakeholders, whose interests were not so easily measured or monetised.

Further, stakeholders without sufficient experience in the subject matter or who are not particularly literate in expressing their values (Section 3.1.2) may be unable to participate effectively in the decision-making process or engage in meaningful discourse (Alberts 2007). This was exemplified by the criticisms made by an OBP key informant who was a landholder conserving OBP habitat. He alluded to how the attitudes of individuals representing all levels of government and of BLA towards his OBP recovery efforts 'evinced feelings of disrespect and highlighted the alien nature of science-based management' (Mattson, Karl & Clark 2012, p.254).

Stakeholders who are not meaningfully engaged may also unwittingly act in detrimental ways. Evidence of this was found in the case of Carnaby's where some local ENGOs were criticised by some key informants for 'hijacking' Carnaby's as an 'anti-development flagship' regarding loss of bushland in the Perth area. The ENGOs' perceived lack of understanding of critical management issues resulted in actions which were thought by government conservation agency representatives to antagonise developers and attract attention away from more strategic recovery efforts.

9.4.3 Marginalised and disengaged stakeholders

Stakeholders identified in this study were engaged in recovery efforts for the case study taxa to varying degrees, described as: 'Public Champion', 'Supporter', 'Affected but Inactive', 'Disadvantageous' and 'Other'. Many 'Affected but Inactive' stakeholders identified have direct links to the individual case study taxa. This indicates there is significant potential for a much larger cross-section of the community to contribute not only to conservation efforts for these taxa, but also for threatened birds more broadly, if provided with the appropriate means and opportunities.

A number of these disengaged stakeholders represented Indigenous groups. Indigenous peoples around the world continue to be among the most marginalised group in environmental management (Gibbs 2010). This points to the assumptions inherent in current management practice and thinking in many Western cultures, including a separation between nature and culture, a desire to classify and control the non-human world and a culture and economy of resource exploitation (Adams & Mulligan 2003; Anderson 1995; Gibbs 2010; Mulligan 2001) (Section 1.3.5). Attending to these assumptions provides a way of challenging Eurocentric and dominant knowledge and helps to develop understandings of other dynamic, interconnected values and ways of being in the world (Gibbs 2010). *Australia's Biodiversity Conservation Strategy 2010-2030* acknowledges this by identifying 'Increasing Indigenous engagement' as a sub priority under 'Priority for Action 1: Engaging all Australians' (NRMMC 2010).

Some 'Disadvantageous' stakeholders conducting activities perceived as detrimental to threatened bird taxa habitat may support specific conservation efforts through various programs such as community partnerships, employee volunteer schemes, sponsoring academic research, or through threatened species management plans (Alcoa 2012). Approaches such as these can raise vital revenue and political support for recovery efforts, as in the case of the Northern Hairy-nosed Wombat (Xstrata Coal 2013) (Section 5.2.1.3.2) or support research activities for mine-site revegetation and rehabilitation, as in the case of Baudin's and Carnaby's (Lee, Finn & Calver 2010, 2013).

Stakeholders who feel they have not been consulted may mount opposition to a policy initiative (Komor & Bazilian 2005). For example, public advocacy groups are developing ever

more powerful strategies for environmental campaigning and the Australian community has demonstrated that, with the appropriate leadership, cause and outlet, it can influence industry and government (Animals Australia 2013a, b; GetUp! 2013).

9.4.4 Meaningful engagement

To identify who future conservationists might be one can look to the past. Almost all key informants in this study became involved in conservation because their direct experiences with nature as children inspired a passion to protect it. It is well established that children who play in wild environments show a greater affinity and appreciation for such places later in life, especially if these experiences take place in the presence of significant others (e.g. Chawla 1998; Clayton & Opotow 2003; Guiney & Oberhauser 2009; Kals & Ittner 2003; Miller 2005; Palmer *et al.* 1999) (Section 2.1.3.4). This study also demonstrated the importance of influential peers in encouraging key informants not only to follow their interests but also to pursue a professional conservation-based career (Sections 5.2.1.1.1; 6.2.1.1.1; 7.2.1.1.1). Significant learning experiences such as these, mixed with environmentally-based education and the promotion of nature-based literature among adults, may allow for fuller development of environmental citizenship in Australia (Mobley, Vagias & Deward 2010). They may also have long lasting and positive effects on conservation-related behaviours and further stimulate those considering a conservation-based career.

Several key informants in this study mentioned the importance of involving different sectors of the community, such as schoolchildren and landowners, in habitat restoration programs and other citizen science projects like the 'Great Cocky Count'. Conservation projects that involve local communities are often more successful at achieving their objectives than those that do not (Danielsen *et al.* 2007). Involving local communities in conservation activities increases their appreciation for, and investment in, their local natural resources (Danielsen *et al.* 2007). Conservation science and practice can also benefit greatly from more widespread integration of local experts into research and monitoring (Elbroch *et al.* 2011). Also, studies have shown that conservation efforts are more likely to succeed if they understand and respond to local institutions and culture rather than ignore traditional values and beliefs (Waylen *et al.* 2010). Therefore, it is important to draw upon place-specific understandings of nature, where

appropriate, to include non-scientists in recovery processes and to benefit from their particular kinds of knowledge (Burgess, Clark & Harrison 2000).

Australia's Biodiversity Conservation Strategy 2010-2030 objective of engaging more Australians in conservation action could be more achievable: if people were able to engage in more meaningful interactions with nature throughout their lives, beginning in childhood; if public knowledge about priority species was increased through experiential educational programs with specific scientific goals; if recovery programs had the resources to develop greater capacity for communities to engage in conservation efforts; and if there was a role for different interest groups to engage in a more meaningful discourse in regard to conservation decision-making processes (Alberts 2007).

9.5 Social values and attitudes towards threatened bird taxa

Section 1.3.8 introduced the concepts of bias and preference in research and conservation effort and demonstrated that particular avian families are favoured over others for research purposes. The findings from this research clearly support this and demonstrated that taxa perceived as iconic, charismatic, having flagship potential or defined as rare are preferred for conservation purposes because of their biophysical, ecological and humanistic interest to conservation stakeholders and the broader community. Preferences are also likely due to significantly varying levels of understanding about different Australian avifaunal taxa. In this way, constructions of threatened bird conservation efforts are necessarily tied to power relations because they have implications for the kinds of actions people may take (Burr 2003) (Section 1.3.3).

For instance, in accord with other studies, this research found that the quality 'charisma' makes some birds more attractive to humans than others (e.g. Lorimer 2006; Mynott 2009). All four parrot and cockatoo case study species were said to be highly charismatic and were described more ardently in aesthetic, conservation, humanistic and symbolic terms than the two chat subspecies. It is well recognised that humans generally show preferences towards bird taxa with particular shapes and colours and that taxa which are economically useful to humans are more appealing to humans than others (Kellert 1989; Liskova & Frynta 2013; Small 2011,

2012; Woods 2000). Knight (2008) suggests this may be related to an emotional reaction to general types of species, rather than cognitive responses towards a particular species; for example emotional reactions may lead to aesthetic preferences towards particular families of birds, e.g. parrots (Knight 2008), which are of particular interest to humans partly because they are capable of vocal learning (Frynta *et al.* 2010).

This study also demonstrated that decisions about which taxa to prioritise for conservation are often influenced by political decision-making, significant events or social attitudes which propel particular birds into the limelight and force some sort of societal response. Responses are specific to culture and knowledge. Findings reported here demonstrated they are generally shaped by: the controversial nature of a threatening event; level of interest in the taxon; social attitudes towards the taxon; attitudes towards the circumstances around its plight; and competing societal interests and values. Taxa receiving most conservation investment tend to be: encountered by a broad cross-section of the community; considered iconic or charismatic; promoted as flagships; defined as rare; or have a positive public profile.

To illustrate, there were scant opportunities for the broader community to engage in Alligator Rivers Yellow Chat recovery efforts and there was minimal social interest in the taxon. In contrast, Carnaby's was known to a large cross-section of society in Perth and the surrounding region, across a diverse range of tenures and the community contributed in various ways to its conservation. Key informants suggested that many people who grew up in South-West WA became involved in Carnaby's conservation activities because they remembered when large flocks of these cockatoos used to blacken the sky and were saddened by the loss of populations.

Elsewhere, fruit growers were the only community group with a direct impact on Baudin's survival. Even though many people perhaps loved the birds and acted to conserve them, many also experienced them as a threat to their livelihoods and their attitudes towards the birds were therefore generally negative. A similar situation was found with fruit growers in New South Wales affected by flying foxes. Because large numbers of Grey-headed Flying-foxes *Pteropus poliocephalus* were affecting crops, many fruit-growers doubted populations were in decline, leading them to believe that these flying-foxes should not be listed as a vulnerable species. This

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created conflict between stakeholders and a barrier for management strategies promoting conservation of the animals (Ballard 2005). Those managing conservation efforts for Baudin's are faced with comparable challenges. Although anecdotal evidence seems to support some fruit growers' complaints about financial loss incurred from damage caused by Baudin's, there is little scientific data to support their claims. This could lead to unnecessarily negative attitudes towards Baudin's. For example, WA Wheatbelt farmers' claims of significant damage to canola (*Brassica* spp.) crops by Carnaby's were over-estimated and the actual damage caused was negligible (Jackson 2009).

Social attitudes towards Baudin's demonstrate how threatened species can be socially constructed as 'pests' due to a lack of specific knowledge among affected parties. Resulting detrimental action may be based on an emotional rather than an informed response. The construction of Baudin's being seen as a pest is exacerbated by a management legacy founded on bounties and open shooting (Chapman 2008). Similarly, the behaviour of dingoes on Fraser Island in Queensland has been constructed as problematic with population management based on the 'essentially benign' act of destroying 'problem animals': 'This is clearly not population management but the management of dingoes to conform to socially constructed parameters of acceptability' (Hytten & Burns 2007, p.52). Illegal shooting of 200 to 300 Baudin's every year by a small number of orchardists significantly affects its population size and dynamics (Chapman 2008). If the taxon is to persist, there is clearly a need to minimise the extent of negative perceptions about it.

Hence, it would appear that threatened bird species which are constructed as iconic, charismatic or flagship species may have an increased likelihood of persisting as a result of greater investment and social interest in their conservation, compared with those which are not constructed in this way. Conversely, species constructed as pests may have less likelihood of persisting than those not constructed in this way, due to detrimental management strategies and negative social attitudes.

9.6 Conclusions

This chapter has explored a number of key themes emerging from the synthesised case study and survey findings. Of major significance was the similarity in the pattern of six key types

of avifaunal attitudes held by key informants and survey respondents for threatened birds and their conservation. Key informants underestimated the strength of public support towards threatened birds in several key ways yet the public is an important stakeholder in the conservation decision-making process. Research participants generally afforded high moral standing to threatened birds in relation to humans and non-threatened species and agreed there is a moral obligation to protect threatened birds, which many saw as a personal and social responsibility. Nevertheless, current conservation policies and processes often do not facilitate engagement of non-experts in the recovery process and many potential stakeholders were marginalised or disengaged. Hence, stakeholder involvement is largely confined to those organisations and individuals deemed to belong to the appropriate knowledge system and to have the appropriate expertise as the issues are currently framed. Finally, key informants valued different taxa in very different ways and this was directly related to the diversity of stakeholders involved in a taxon's recovery effort, as well as levels of conservation investment and social interest in it. Taxa deemed problematic received less conservation investment than those perceived positively. The next chapter explores the implications of these key findings for the future of threatened bird conservation in Australia, reflects on the research approach and provides recommendations for future areas of study.

Chapter 10: Research Implications

This chapter explores implications for threatened bird conservation arising from key research findings and makes recommendations for practical applications of the research. The chapter then reviews the main strengths and weaknesses of the research approach. Finally, areas of potential future research are identified.

10.1 Research implications

Drawing predominantly from the discipline of social psychology, and particularly from the theory of social constructionism and the research field of human dimensions of wildlife, this study has highlighted the importance of understanding how threatened birds are valued and the influence of these values on their conservation.

In answering the study's research questions, the research identified two major gaps in understanding in *Australia's Biodiversity Conservation Strategy 2010-2030, Priority for Action 'Engaging All Australians'* (NRMMC 2010) and these have been addressed: the research has increased our understanding about which key sectors of society are currently engaged in threatened bird conservation; and it provides decision-makers with insights into Australian social values and attitudes regarding threatened birds and their conservation, both from the perspective of specialist conservation experts with practical experience of implementing conservation policies and of the general public who may support threatened bird conservation in a more general way.

The findings demonstrate how the social constructions of threatened birds (e.g. their threatened status, whether they are flagships, their identification as rare, social attitudes towards them and public profile in the media) and the issues affecting them influence their conservation, as seen through the eyes of conservation experts. In practical terms, the findings provide valuable insights into factors affecting stakeholder engagement in recovery efforts for threatened bird species and for framing effective conservation strategies which appeal at both a policy and public interest level.

Biological uncertainty tends to be the norm in most wildlife policy debates and the greater the degree of biological uncertainty, the more clearly wildlife policy derives from competing and interacting social, political and economic forces (Kellert 1986). This research has demonstrated that wildlife managers place a priority on the need to understand threatened bird species'

biological and ecological requirements while at the same time they must contend with their own and others' social values and other influences on wildlife policy. These are represented by various valuational, institutional/regulatory, social-structural and biophysical systems, each of which is dynamic and inter-related and may complement or compete with specific recovery objectives. Using key research findings, Figure 10.1 adapts Kellert and Clark's (1991) wildlife policy framework, introduced in Figure 1.2, to demonstrate how social values are understood to influence the four major systems operating on wildlife policy relating to threatened bird conservation. It also shows stakeholder groups associated with each system, identified by key informants as most influential in the conservation decision-making process. Major implications of the research findings are discussed in relation to these four systems in Sections 10.1.1 to 10.1.4.

Research implications



Figure 10.1: Influence of social values on the threatened bird conservation policy process. Dynamic inter-relationships exist between the four systems so they continually influence each other. Specific research results are shown in the valuational quadrant to position this research in the context of other wildlife attitudinal research. Boxes in the institutional/regulatory, social-structural and biophysical quadrants show stakeholder groups associated with each system, identified by key informants as most influential in the conservation decision-making process (adapted with permission from Kellert & Clark 1991).

10.1.1 Valuational: values and attitudes

This research has demonstrated that native bird species are important to Australians for diverse environmental and social-psychological reasons. Generally speaking, findings indicate that both non-threatened and threatened bird species are a source of interest, wonder and joy for people; their potential loss is a cause for concern and evokes strong and widespread feelings of regret, sadness and despair. Given the evidence, it is suggested that many Australians positively engage with native birds and there is strong public support for threatened bird conservation.

The significance of biophysical, ecological, experiential, humanistic and moral attitudes in this research among both key informants and survey respondents, and their consistency with other studies on Australian attitudes towards other kinds of wildlife (e.g. Aslin 1996; Fitzgibbon & Jones 2006; Franklin & White 2001; Miller 2000, 2003), suggests these may be widely held attitudes for non-threatened and threatened wildlife. That Australians hold these kinds of attitudes towards wildlife is likely due to social and cultural assumptions about what the world is like. The greater the importance people place on wildlife, the more it is perceived as deserving of support, protection and worthy of care and concern (Brandt & Reyna 2011).

The importance of conservation attitudes regarding threatened birds among both key informants and survey respondents suggests there is stronger support for the conservation of birds among Australians than the current rate of extinctions, species decline and level of government support might indicate. Similarity in the frequency and types of attitudes expressed by key informants and survey respondents regarding threatened birds implies there is commonality between these two major stakeholder groups which could be more effectively leveraged in terms of refining communication strategies between wildlife managers and the public.

Both key informants and survey respondents believed that conserving threatened birds is a socially and morally appropriate goal. To paraphrase Kluckhohn (1962), the biophysical, conservation, ecological, experiential, humanistic and moral avifaunal attitudes are generalised and organised conceptions of what Australians find desirable regarding human-threatened bird relations. That is, Australians appear to consider that it is better to conserve threatened bird

species than to lose them and this can be justified either morally, by reasoning or by affective judgment. This finding may be useful in persuading policy-makers there is political currency to be gained from improving threatened bird conservation policies and practices.

A key finding of this study is the existence of avicentric and anthropocentric value orientations regarding threatened birds within survey respondents, implying that different patterns of attitudes towards threatened birds exist within the broader community. Avicentrism and anthropocentrism were socially located according to gender, age and level of education, indicating they are linked to gender roles and socialisation processes which are relatively stable and reflect cultural values and world views. Since human values and attitudes towards wildlife are thought to comprise cognitive, affective and evaluative factors, such value orientations are likely linked to individual differences in personal value systems and environmental identity associated with particular wildlife-related experiences, knowledge and beliefs. Importantly, the existence of avicentric and anthropocentric value orientations regarding threatened birds suggests that those holding these value orientations would support conservation of threatened birds, but differences in attitudes could lead to conflict where decisions are made that prioritise the needs of humans over threatened birds, or vice versa. To illustrate, the case studies demonstrated how different attitudes towards land-use activities can polarise public views about threatened bird recovery efforts.

A second area for potential conflict was identified by some key informants who suggested that the public seems concerned with the rights of individual animals, but does not tend to see the connection between threatening processes and the loss of wildlife populations. This implies there is a disparity in people's interests in animals as individuals or as species (Miller & Weston 2009). This disparity is possibly linked to a general lack of experience among members of the public with encountering threatened species in their natural habitats, and a general lack of knowledge about the issues associated with threatened bird conservation (Wilson & Tisdell 2005). This was highlighted by the difference in frequency with which humanistic and experiential attitudes were held between key informants and survey respondents. For key informants, experiencing threatened species in their natural environment was linked to empathy for their plight, whereas survey respondents indicated they would feel upset if a

threatened bird became extinct but were less interested in experiencing it in the wild than key informants.

Such a disparity is presumably exacerbated by a growing physical separation between an increasingly urbanised population and the natural environment. Increasing dependency on companion animals, often promoted to the status of family members, and experiencing animals in captivity rather than in the wild, can reinforce confusion about appropriate behaviour towards other species (Berger 2009). In North America, modernisation of social processes is thought to have influenced a population-level shift from domination to mutualism value orientations towards wildlife. Importantly, 'People with a mutualism orientation are less supportive of forms of management or individual behaviors that result in death or harm to wildlife' (Manfredo, Teel & Henry 2009, p.422). An implication of this kind of disparity is exemplified by differing views on the management of feral cats in Australia where public sentiment for individual cats sometimes clashes with conservation scientists' goals and strategies (Franklin 2013; Insight 2013).

Thus, although the public generally supports threatened bird conservation, conflicting social attitudes may arise in response to specific issues or management actions. Therefore, it is important that wildlife managers and other decision-makers attempt to understand public attitudes and develop a better appreciation of the motivations and social characteristics of those holding potentially conflicting views so that social values can be incorporated into threatened bird recovery strategies and thereby increase their potential for success.

10.1.2 Institutional/regulatory: policies and processes

Given the apparent widespread public connection to birds identified in this research, it seems contradictory that one in five Australian bird species is currently identified as threatened. While the listing of threatened species in state, territory and Commonwealth legislation indicates that Australian society does place some value on its native bird species, the rate of bird species' decline and key informants' comments about the lack of commitment to biodiversity conservation from both the government and the public suggest that Australia does not value its biodiversity very highly at all, especially when compared with government commitment to other social issues, such as developing the economy.

The public elects the government and wildlife management in Australia is a 'public good', therefore biodiversity conservation is seen by most members of the public as primarily the responsibility of government and operates by and large as a function of public policy. However, there are no direct links between the general public's attitudes and values regarding threatened birds and public policy decisions. Rather, there is a highly complex governance structure involving a number of different decision-making bodies, each of which can influence the threatened bird conservation policy process in positive or negative ways subject to the motivations of important individual representatives and depending on how their representations are received by other decision-makers. This alludes to the complicated interrelationship between public attitudes towards threatened bird conservation and their influence on priorities in public expenditure.

This research identified that Commonwealth and state/territory government conservation agencies, and politicians and ministers are perceived by wildlife managers to be highly influential stakeholders in threatened bird conservation because of their power to influence conservation policies and processes in general as well as specific recovery efforts. A major difficulty identified by the research is that protection of the environment is sectoralised within government so that responsibility for threatened bird conservation usually falls to individual experts operating within government departments managing multiple related issues. The case studies demonstrated how the highly political nature of threatened bird conservation and the prevalence of institutional-level cognitive dissonance, primarily due to the conflicting interests and responsibilities held by individual affected government departments, can be detrimental to the success of threatened bird conservation strategies.

This appears symptomatic of competing social values and the positioning of conservation investment as a lower social priority than some other kinds of public investment. For example, the research has shown how land development and resource extraction are sometimes prioritised over conservation of threatened bird habitat and this may be due to a shifting trend in government policies and processes from environment and heritage conservation towards facilitating developments and catering to development interests. Manfredo and colleagues (2003) predicted several possible trajectories for shifting wildlife value orientations in the USA,

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many of which are closely tied to the relationship between economic growth and expanding degradation of the environment. While the 'best case scenario' hinted at a shift towards a protectionist view of wildlife, the 'worst case scenario' foretold: '...an acceleration of environmental degradation due to the "treadmill of production" inherent in capitalism...' (Manfredo, Teel & Bright 2003, p.302).

If loss of further bird species is to be prevented, it is essential that policy-makers are made aware of the significant environmental and social-psychological importance of native and threatened birds to much of the Australian public. Policy-makers should be made aware that many Australians believe there is a social and moral obligation to conserve threatened birds and that many Australians would put the needs of threatened birds before those of humans. To prevent further loss of threatened bird populations, policy-makers could be encouraged to prioritise protection of threatened birds more highly when making decisions that may result in environmental degradation or loss of threatened bird habitats. Clearly, the values and attitudes of individual policy-makers are crucial to the success of threatened bird conservation strategies, however they are seldom the subject of research like this, hence this is identified as a vital area for future research.

10.1.3 Social-structural: competing social interests

This study demonstrates that a variety of stakeholders with competing social interests can influence threatened bird conservation decision-making processes, including the general public, Indigenous groups, land developers, landholders, the media, resource extractors and volunteers. Nevertheless, the current paradigm often denies much of the community the capacity to engage meaningfully in conservation efforts by over-emphasising scientific values in the conservation process. Thus, the power to influence most conservation efforts appears to lie mainly with high level decision-makers and influencers in government, ministerial offices and parliament, who tend to retain control of decision-making processes, as well as those currently deemed by society to be 'appropriate' knowledge experts. Those with different types of knowledge, such as landholders or Indigenous groups, are effectively marginalised from decision-making processes and must be 'engaged' before they can contribute in a meaningful way. Importantly, a disparity between public attitudes and conservation outcomes can often

lead to conflict (Opotow & Weiss 2000) and those marginalised from the conservation process may mount opposition to a conservation or policy initiative (Komor & Bazilian 2005).

The research suggests that a range of institutional and personal barriers is likely to be currently preventing people from participating in conservation efforts. Despite the public as a whole appearing to strongly support threatened bird conservation, individuals are generally not sufficiently organised, motivated or physically able to advocate for particular conservationrelated issues. They would find it difficult to convey their attitudes to government about threatened bird conservation, other than through organised conservation programs which they must be aware of and see the value in if they are to support. The public's general lack of knowledge about threatened birds could lead to the disappearance of particular species without the public being aware of their extinction (Wilson & Tisdell 2005). Hence the importance of prominent special interest groups and ENGOs, such as BLA, which play a critical role in shaping threatened bird conservation processes by framing environmental issues and engaging their members in citizen science and threatened bird conservation activities.

The research has highlighted the importance of understanding the value dynamics existing between different stakeholders. For example, the case studies described how social values and attitudes towards individual threatened bird taxa can significantly affect the success of a taxon's recovery efforts, mainly by people behaving in ways perceived to be advantageous or detrimental to a species' survival. The case studies showed that different types of stakeholders (e.g. state government conservation agencies and ENGOs) may have diverse objectives based on their individual, group or organisational values, and the lack of consensus between different stakeholders about what the outcomes of conservation efforts should be can create major difficulties when making decisions about conservation spending. This may lead to conflict and mistrust which can detrimentally impact on recovery efforts.

The research demonstrates that knowledge about different taxa is socially distributed across different stakeholders who have varying degrees of experience and differing types of knowledge about the specific management requirements of different taxa, depending on a range of factors including the type of institution they represent or their role in a taxon's recovery effort. It was clear from the case studies that together, different stakeholders hold an

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objectified stock of knowledge about individual threatened bird taxa which may include local, specialised, strategic and integrative knowledge (Aslin & Brown 2004) as well as the commitment required for recovery efforts for those taxa to succeed.

Therefore, it is important that wildlife managers identify all potential stakeholders holding diverse types of knowledge about individual threatened bird taxa and try to achieve meaningful engagement in conservation decision-making processes for relevant taxa. An important step in this process is for wildlife managers to ascertain which particular values and attitudes are held by different stakeholders towards a taxon and to devise conservation strategies that appeal to those attitudes and values. This could help wildlife managers to see similarities in the problems that affect different threatened bird taxa and to adapt the solutions, knowledge, lessons and skills from successful cases to others (Clark & Wallace 2001). This could also lead to different stakeholder groups achieving much greater ownership of, and responsibility for, conservation of threatened birds, thereby making the public a more powerful stakeholder in terms of threatened bird policy-making.

10.1.4 Biophysical: framing and social construction

10.1.4.1 Framing conservation decision-making

The westernised nature and structure of Australian society has meant that scientific knowledge about threatened birds and their conservation is privileged and there is a dependence on the biological sciences to inform policy and practice experts. When scientists are deemed a more relevant source of knowledge regarding management of threatened species than landholders or Indigenous people for example, it signifies that experts, not members of the public, are principally responsible for its conservation. This is problematic because framing of threatened bird conservation issues as principally biological or ecological rather than social, infers that these are the accepted ways of understanding those issues and that specialisation in the biological sciences is required to contribute towards conservation decision-making processes. This serves to deny the many 'living natures' thought to exist within a society (Soulé 1995).

Kellert and Clark (1991) recognised that one of the most important challenges facing the wildlife profession is developing the means for effectively expressing the full range of wildlife

values to people and society. The case studies established that key informants tend to emphasise conservation, moral, ecological and biophysical attitudes when communicating their values for threatened birds to others, including the public, particularly in the formal documents they typically use to convey their knowledge about threatened bird conservation. Expressions of aesthetic, experiential, humanistic, mastery, negative, spiritual, symbolic and utilitarian attitudes were largely absent. Evidently, the challenge described by Kellert and Clark is not being met in the context of Australian threatened bird conservation.

Such narrow framing likely results from the ways that conservation experts tend to socially construct the management and conservation of threatened birds. That is, the experts' constructions of threatened birds are based upon their personal realities and areas of specialised knowledge; the roles they play as biological scientists and the assumptions they may make about wildlife as a consequence; and the values and practices of the institutions they represent. The predominant use of specialised vocabularies and technical language in the kinds of documents conservation experts rely upon, and the prevalence of biological, conservation and ecological subject-matter, serves to reinforce the authority of biological scientists to laypeople. In this way, a mechanism is at work which attempts to maintain the power relationship between conservation experts and others (Berger & Luckmann 2011). Such constructions of the world are necessarily tied to power relations because they have implications for what it is permissible for different people to do and for how they may treat others (Burr 2003). In other words, biological scientists representing government conservation agencies, private consultancies, ENGOs and universities were considered highly influential by key informants in threatened bird conservation decision-making processes because of their established roles as experts about, managers of, and advocates for threatened birds.

Such narrow framing is problematic because Lakoff suggests humans suffer from 'massive hypocognition' in the case of the environment. This means that scientists, citizens, leaders, policy-makers and journalists typically lack the frames with which to capture the complex social landscape within which threatened species management operates and the issues it is tied to, such as economics, energy and health (Lakoff 2010). Further, framing biases exist, so that frames may trigger positive or negative reactions in people, and policy-makers may be just as

subject to biases in their thinking as policy-takers. Certain types of framing can affect decisionmaking, for instance decision-makers' preferences tend not to be fixed but vary depending on how the decision-making situation is framed (Hughes 2013). The case studies demonstrated that key informants representing different sectors of society expressed some attitudes towards threatened birds with different levels of frequency, indicating that some of their attitudes were more important to them than others.

The framing of threatened bird conservation efforts, predominantly in terms that may only resonate with biological scientists, could therefore trigger framing biases among decision-makers. Decision-makers may have very different interests to those of biological scientists, and framing biases could deter them from supporting threatened bird conservation strategies. Hence, there is a need to develop effective frames for conveying the full range of threatened bird values to policy-makers and society. To be more persuasive to those holding different types of attitudes and values, this framing should be based on an understanding of the ways that social values influence conservation strategies, so that messages can more holistically convey the social processes involved and consider the different conceptions of 'living natures' existing in Australian society.

Since the way a new topic is introduced into public, policy or scientific discourse is thought to influence the conclusions drawn (Selge & Fischer 2011), it would be useful for wildlife managers to consider new ways of framing threatened birds and associated issues and new ways of communicating beyond their sphere of expert knowledge. It is important that wildlife managers do not assume they know how people value threatened birds; they should base their communication strategies on evidence rather than assumptions (Miller 2000). This is where social scientists can contribute to developing a better understanding of the attitudes and values of different threatened bird conservation stakeholders and, among other things, play a significant role in developing effective communication strategies that appeal at both a policy and public interest level. A positive consequence of this could be to help policy-makers identify areas where government could better support policies regarding threatened bird conservation and potentially lead to relevant legislation being integrated across governments to mitigate threatening processes.

10.1.4.2 Social construction of threatened bird taxa

Another consequence of privileging the biological sciences in threatened bird conservation decision-making processes is that biological scientists tend to be charged with developing and managing conservation priorities, plans, strategies and actions.

At the outset of the research it was suggested that human preferences necessarily bias research and conservation effort; the findings support this idea and describe the extent to which individual threatened bird taxa are valued differently and how this may be linked to overall levels of conservation investment and social interest. The findings also demonstrate that decisions about setting priorities for threatened species investment are generally made by experts, for example government conservation agency scientists and BLA staff members, who themselves are passionate and often devote their careers to one or a small number of species. However, conservation experts tend to value rare and threatened bird species more highly than common species, for example focusing their research effort on threatened bird taxa and advocating for the listing of individual threatened species in environmental legislation. The research highlighted that not all listed threatened species are allocated sufficient resources to conduct recovery efforts or facilitate community engagement strategies, so only a small proportion of the public has the opportunity to participate in conservation decision-making or action. Further, due to the ways in which the public tends to interact with birds and their general lack of knowledge about threatened bird taxa and associated issues, the public may value non-threatened bird taxa more highly than threatened taxa, because of greater familiarity with them.

It was evident from the case studies that conservation action for individual threatened bird taxa is directly influenced by the ways different taxa are socially constructed by key stakeholders. Social attitudes towards a threatened bird taxa are specific to culture and knowledge. Consequently, taxa constructed as iconic, charismatic, having flagship potential or defined as rare are often preferred by conservation experts for conservation purposes because of their biophysical, ecological and humanistic interest to conservation stakeholders and the broader community. Importantly, this finding highlights the difficulty of conserving taxa existing in remote, inhospitable locations, those with little interest from society, or those considered

pests, since they typically tend to receive least conservation investment and community support.

Australia's Biodiversity Conservation Strategy 2010-2030 suggests that one way of engaging more Australians in biodiversity protection is to facilitate public engagement in conservation efforts as much as possible (NRMMC 2010). However, as the case study findings demonstrated, some threatened bird species lend themselves better to opportunities for community engagement than others and findings suggest that taxa identified for conservation investment are typically of importance to an elite group of specialists rather than those valued by the broader community. A reliance on scientific values has led heritage conservation practitioners to question whether the motivation and rationale that underpins the protection of heritage places protects a select group of places that are significant to specialist elites rather than places valued by the entire community (McIntyre-Tamwoy 2004). Presumably, since public support for conservation strategies is necessary, a similar situation in threatened bird conservation ought to be avoided. If so, there needs to be greater consideration in the conservation process of attitudes held by the broader community towards individual taxa, particularly those of potential stakeholders, not just those deemed experts.

10.2 Main recommendations

The implications of these research findings lead to three over-arching recommendations.

10.2.1 Incorporating a range of disciplinary perspectives

Integration between the social and natural sciences is thought to have been limited, partly because of the barrier caused by major philosophical differences in the perspectives of the different disciplines involved (Evely *et al.* 2008). However, this study argues that social science research is fundamental to better understanding the conservation process; therefore, it recommends that a significant investment is made to incorporate perspectives from the social science sciences into conservation research strategies.

Because HDW studies explore human relationships with nature more broadly, they are likely to reveal attitudes that are not typically expressed in contemporary conservation literature. These include aesthetic, utilitarian, experiential, humanistic, moral and negative attitudes,
among others. This could contribute significantly to our understanding of how threatened birds are valued by different sectors of society. Ultimately, employing different social science disciplines to explain and possibly predict human behaviour could lead to the broader community becoming more effectively involved in conservation decision-making processes (Mascia *et al.* 2003). In turn, this could deliver more research opportunities for interdisciplinary collaborations or broaden readership of research findings to multiple other disciplines and possibly make them more accessible and acceptable to mainstream society. Importantly, these kinds of studies could contribute to creating more appropriate frames that capture the wider social landscape within which threatened species conservation operates.

10.2.2 Practical application of the avifaunal attitudes typology

It may be that wildlife managers are uncertain about how to apply human dimensions information to everyday problems (Miller 2000). Therefore, this research recommends that the avifaunal attitudes typology be employed by those working to conserve threatened birds as a practical, collaborative, multifunctional tool in the conservation decision-making process. The typology could be employed as a research planning tool and/or as a stakeholder analysis tool. Outcomes from either approach could contribute to developing targeted communications or engagement strategies either for recovery efforts for specific taxa or to generate conservation support for threatened birds more generally. In this way, wildlife managers can move beyond viewing threatened bird conservation as a concern mostly for biological scientists, and social science researchers can be involved in conservation strategies more readily and at an earlier stage of the planning process. These strategies could help to ensure that taxa valued by the broader community, not just experts, are considered for conservation prioritisation. This may increase the prospect that Australians will more highly value avian biodiversity and wish to conserve it.

10.2.3 Social values and 'ecological triage'

Another way to consider social values in the conservation process is through the Project Prioritisation Protocol (PPP). Findings from this research support the argument that instrumental values are important to this process. The findings also highlight the overall

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importance of biophysical, conservation, ecological, experiential, humanistic and moral attitudes to threatened bird conservation. Taxa could therefore be weighted primarily on the extent to which society holds these attitudes towards them. However, since all 12 avifaunal attitudes were held to some degree for the six case study taxa overall, any assessment of a taxon's weighting within the PPP should strive to include social attitudes in terms of all 12 types of attitudes in the typology. Clearly, to assess public attitudes towards individual threatened bird taxa, the public must first know something about them and this would require much greater investment in public outreach, complemented by greater investment in research on the social values of threatened birds.

Additionally, it is important to assess comparative perspectives across whole groups of wildlife (e.g. birds, reptiles, amphibians) because people show preferences towards different wildlife groups. Also, conservation priorities tend to be set at the level of wildlife groups as evidenced by the various *Action Plans* and *Conservation Overviews* produced by the Australian Government (DoE 2013). However, research on the human dimensions of wildlife tends not to operate at this level and often deals with a single species. Therefore, this research is novel and, although it has a focus on threatened birds in Australia, the approach may be transferable to other classes of wildlife and other countries.

10.3 Reflections on the research

The research yielded results which contribute knowledge to the social psychology discipline, the field of human dimensions of wildlife, and the theory of social constructionism. It has also shed light on some strengths and limitations of the methods used.

10.3.1 Research framing

A major challenge for this research was to deconstruct the biological sciences/conservation biology concepts largely driving the original research objectives and situate the study within an interpretivist paradigm. As a result of the natural science origins of the research, many of the research questions primarily centred around threatened birds as the subject of the inquiry, as opposed to the people whose values and attitudes were in question. A more sociallyappropriate way of organising the research questions would have been to re-order them according to the stakeholder groups to which the questions refer. This would have placed the research emphasis on the 'agents' and possibly allowed for the application of analytical methods, such as Actor Network Theory, to explore stakeholder knowledge and power relationships (e.g. Latour 2005).

10.3.2 Representativeness of key informants and survey samples

It is important to note that the research results may have limited generalisability because of factors affecting the choice of participants (as occurs with much qualitative and quantitative research). Key informants were not selected randomly; despite efforts to include key informants who might represent a diverse range of opinions from the five major sectors of society, those interviewed were directly involved with the case study taxa chosen for in-depth research and were willing to participate in the research. The majority were biological scientists, which reflects their overall importance to the threatened bird conservation process in general and is a consequence of the way that a particular kind of expertise is currently privileged because of the nature of conservation practice. Accordingly, key informants' attitudes strongly converged on some of the issues discussed in this thesis. Nevertheless, this is the largest group of key informants of any study yet conducted which explores the attitudes of Australians towards conservation of threatened birds and they have provided significant insights into the attitudes of those most influential in the conservation of the particular taxa studied, and some of the social factors influencing threatened bird conservation practices more broadly. Some findings may therefore be generalised to similar taxa in similar contexts and some to threatened bird conservation more generally.

Also, the public survey participants were self-selecting to varying degrees so may not be representative of the entire Australian public. The large sample sizes help to reduce sampling error, although generalisation from survey respondents to any larger population through inferential statistics needs to be undertaken with due reference to its shortcomings (Dillman & Bowker 2001).

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10.4 Future research

This research is a picture of values and attitudes at a certain time. As such, it provides a baseline for further research on how social values may be changing over time so we can better understand what this means for the future of threatened bird conservation. Future research can also turn to further exploring why threatened birds are valued in the ways they are and, for more applied research, measure and assess the influence of social values in the conservation process. The following areas are of particular interest:

- conduct further quantitative surveys of the Australian public to explore attitudes and values regarding threatened birds and their conservation in more detail and to track changes in attitudes over time;
- 2. develop a more streamlined method of gathering social values data for Australian bird taxa using the avifaunal attitudes typology so that the baseline can extend to more species and more stakeholders. Hence, threatened bird taxa can be more efficiently assessed in terms of their overall value to society and better evaluated in decision-making processes, such as those using the Project Prioritisation Protocol;
- develop and adapt the avifaunal attitudes typology so it may be used to assess social values held for other classes of wildlife in Australia and elsewhere and to more readily explore changes over time; and
- 4. implement a social marketing campaign using the avifaunal attitudes typology as a communications tool to develop effective communication strategies regarding threatened bird conservation. The strategy could target policy-makers, conservation volunteers and other special interest groups relevant to the conservation process and, if it is effective, it could provide a sound basis for future efforts.

Appendices

Appendix 1: Quantitative Survey Instrument

The electronic online survey instrument is shown as a series of 'screen clippings' to demonstrate how survey participants would have experienced individual questions as they progressed through the survey. Titles such as 'Landing screen', 'Orientation screen' and 'Screen one' have been inserted for the sole purpose of orienting readers of this thesis; they did not appear to respondents.

Landing screen



This survey aims to find out what birds mean to Australians. It is part of a larger PhD study called The Social Values of Australian Threatened Birds which aims to improve the ways we conserve birds and their habitats.

Since this is a public opinion survey, you don't have to be knowledgeable about birds, as the questions cover general topics relating to them. Participation is voluntary. Even if you decide not to participate in this survey, you are welcome to see the results, which will be available on my website later in 2011

Thank you and enjoy the survey! Gill Ainsworth (Ms) School for Environmental Research, Charles Darwin University, Darwin, NT, Australia

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This research is supported by the Birds Australia Stuart Leslie Bird Research Award 2010



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OACT		OSA			
ONSW		OTAS			
ONT		OVIC			
OQLD		OWA			
Back Next					
	07.	1003			
Screen four					
Thinking about your daily life, how much	do you agree o	disagree with t	hese statement	ts?	
(tick one option for each statement)					
			Neither		
	Strongly	Diagaras	Agree nor	Anna	Strong
Losy attention to hirds wherever Los	uisagree	Disagree	Disagree	Agree	Agre
Lean identify common birds in my area	0	0	0	0	0
Seeing a new bird fills me with excitement	0	0	0	0	0
I am not really interested in birds	0	0	0	0	0
The second s	0	0	9	2	0
Contraction of the state of the state of					

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Screen five

Please rate your overall ability to identify birds by sight and/or sound.

(tick one option for each statement)

I can identify...

	None	Some	Most	All
Common birds, e.g. magpie, cockatoos, kookaburras	0	0	0	0
Moderately difficult birds e.g. honeyeaters, owls, waterfowl	0	0	0	0
Difficult birds e.g. seabirds, waders, thornbills, corvids	0	0	0	0
Vagrants	0	0	0	0

Back Next

0% 100%

Screen six

Imagine you are sitting in the bush when a large and colourful bird appears and comes walking towards you. What might you feel?

Please tell us by stating how much you would agree or disagree with these statements.

(tick one option for each statement)

	Strongly disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
I would probably pay little attention to it	0	0	0	0	0
I might tick the bird off my birdwatching list	0	0	0	0	0
I might feel closer to nature	0	0	0	0	0
I might feel frightened or annoyed	0	0	0	0	0
I'd be happy such a bird exists	0	0	0	0	0
I'd feel affection for the bird	0	0	0	0	0
I'd want to learn about the bird's behaviour	0	0	0	0	0
I'd want to learn about the bird's habitat	0	0	0	0	0
I might collect some feathers for decoration	0	0	0	0	0
I'd enjoy just watching it or listening to it	0	0	0	0	0

(Back Next

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Screen seven

The next three questions ask you to pick your preferred bird from a range of different options.

Each question shows descriptions of three different birds. There is information about size, appearance, call, behaviour and conservation status.

The image is there to help you visualise birds of different shapes and sizes - small (dark shading), medium (mid-shading) and large (light shading).

In each question please take some time to consider all three descriptions then choose the bird you find most appealing.

Choice #1

Which of the following birds might give you the greatest pleasure?



Medium bird, length 15cm Subtle brown, black, grey and white Quiet with occasional soft chatter Confiding and readily approachable Common over extended range Large bird, length 50cm Colourful chestnut, brown and olive-grey Sweet-sounding, fluting warble Secretive and rarely seen in open Common over extended range

100%

0%

Small bird, length 8cm Subtle brown, black, grey and white Quiet with occasional soft chatter Confiding and readily approachable Threatened, population declining rapidly

Next

Screen eight

Choice #2

Which of the following birds might give you greatest pleasure?



Large bird, length 50cm Subtle brown, black, grey and white Sweet-sounding, fluting warble Secretive and rarely seen in open Rare but widespread, not threatened Small bird, length 8cm Bold black, white and grey Quiet with occasional soft chatter Secretive and rarely seen in open Rare but widespread, not threatened

100%

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Small bird, length 8cm Colourful scarlet, green and blue Harsh abrasive crowing Confiding and readily approachable Rare but widespread, not threatened

Back Next



Screen nine

Choice #3

Which of the following birds might give you greatest pleasure?



Screen ten

Thinking about the different bird species found around Australia, which do you think are the most attractive overall?

Why do you find these birds the most attractive?

(please tell us about up to five birds and provide their full names if you can)

	Most attractive birds	Why do you say that?		
	Name of bird	Reason for choice		
Bird #1				
Bird #2				
Bird #3				
Bird #4				
Bird #5				

Back Next



Screen eleven

Many of Australia's birds are endangered (1 in 5 species) and it's uncommon to see an endangered bird in the wild.

Thinking about how you would feel if you knew you had seen an endangered bird, how much do you agree or disagree with these statements?

(tick one option for each statement)

If I saw an endangered bird, I might...

	Strongly disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
want to learn more about the bird	0	0	0	0	0
add it to my birdwatching list	0	0	0	0	0
regret that humans had caused the bird to become endangered	0	0	0	0	0
think there's a moral obligation to protect the bird	0	0	0	0	0
feel it's a nuisance when an endangered bird stops development	0	0	0	0	0
think the bird has a right to live only if it's beautiful or unusual	0	0	0	0	0
feel the needs of people come before those of endangered birds	0	0	0	0	0
think government is responsible for the bird's survival, not me	0	0	0	0	0
feel upset if the bird became extinct	0	0	0	0	0
feel privileged or spiritually uplifted	0	0	0	0	0

(Back Next)

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Screen twelve

Some bird species are likely to become extinct over the next 10 years unless they get more support from the public to help protect them.

Of the money you might donate to any kind of cause (charitable, conservation etc), how much would you be willing to pay per year into a bird conservation fund?

(if you would prefer to donate a different amount to that shown below, please write your preferred amount in the box)

○ \$50 per year

O Or, please specify your preferred amount:

O I would not donate any money to a bird conservation fund

Back Next

0% 100%

Screen thirteen

What other thoughts or comments do you have about bird conservation in Australia?

c)(Next)		
(Next)		
	Next	

Screen fourteen

Have you ever been or are you currently a member of any of these types of organizations?

(tick all that apply)

- A conservation group (e.g. World Wildlife Fund, or a local group)
- A national bird group (e.g. Birds Australia)
- A local or regional bird association (e.g. Birding NSW)
- A zoological association (e.g. 'friends of a zoo' group)
- A museum society or group
- A hunting group or association (e.g. Sporting Shooters Association)
- C A scientific society (e.g. Australian Ecological Society)
- An animal welfare or animal rights society (e.g. RSPCA, Animal Liberation)
- A field naturalists group
- Other, please specify:

No, I have never been a member of these kinds of organizations

Back Next



Screen fifteen

Have you ever taken part in any of these nature-based activities?

(tick all that apply)

- Birdwatching
- Bushwalking /visit national parks / go on tours with an environmental component
- Water sports (e.g. sailing, canoeing, windsurfing etc) / go to the beach
- E Fishing or hunting
- U Watch wildlife programs / purchase nature books or magazines
- Rescue or help injured wildlife
- Undertake formal study on animals or some aspect of nature
- Visit zoos or wildlife sanctuaries
- Other, please specify:

No, I have never taken part in these kinds of activities

If you currently take part in any nature-based activities, who do you most often do them with?

(tick only one)

 I do them on my own
 I with members of a conservation group

 With my partner
 Other, please specify:

 With my child / children
 Do not currently do these kinds of activities

 With other family members
 Back Next

0% 100%

Screen sixteen

	ABOUT YOURSELF
What is the highest level of -duration	annia anniatad?
Vear 12 or below	O Postaraduate degree (MSc. PhD etc.)
	O Other please specify
O Bachelor degree or equivalent	Control, please specify.
How would you describe your current work	situation?
Conducting own business	O A student
OA wage or salary earner	Homemaker
OA helper not receiving wages	Other, please specify:
Retired / semi-retired	
What is your gross income from all sources	(including pensions and allowances)?
OUp to \$40,000 per year	State (\$81,000 or more per year)
S41,000 to \$80,000 per year	○ Don't know / prefer not to say
Where were you born?	
OAustralia	◯ Italy
⊖England	◯ Greece
◯ Scotland	◯ Viet Nam
O New Zealand	Other, please specify:
Back Next	
0	100%
End screen	
ocial Values of Australian Threatened Birds	
Qualtrics.com	
We would like to thank you for taking the received and extremely important to us.	time to complete our survey. Your opinions and responses are gratefully
The insight which you have given us will	be used to help conserve Australia's native birds.
Your responses will be used at an aggreg	ate level only, and as such we would like to assure you once again that f confidence and will not be passed on to any other party for any purpos
other than that which it was intended.	
other than that which it was intended. Once again thank you for your interest. To your details are always up to date.	o ensure that you receive further relevant surveys, please make sure tha
other than that which it was intended. Once again thank you for your interest. To your details are always up to date. Please click the 'Submit' button below to	o ensure that you receive further relevant surveys, please make sure tha earn your points.
Once again thank you for your interest. To your details are always up to date. Please click the 'Submit' button below to Back Next	o ensure that you receive further relevant surveys, please make sure tha earn your points.
Once again thank you for your interest. To your details are always up to date. Please click the 'Submit' button below to Back Next	o ensure that you receive further relevant surveys, please make sure that earn your points.

Appendix 2: Quantitative Surveys - Additional Analyses

The following statistical analyses relate to the three quantitative surveys (Social Values, Birds in Backyards and BirdLife Australia) discussed in Chapter 4.

Quantitative survey response rates and non-response bias

To quantify any systematic pattern in non-response bias, PermissionCorp, the research panel company that distributed the Social Values and BirdLife Australia (BLA) general public surveys, was asked to provide demographic information about panel members who were invited to participate in the two surveys but who did not respond. Response rates of 11% and 12% were achieved, which is consistent with other online surveys conducted by the panel company (pers. comm. Wong 2011) and others (e.g. Sax 2003). Non-respondents had similar characteristics to the national population in terms of age, gender and geographic location implying there was no sampling bias in this respect. The lower response rate from the 18-35 age group than other age groups may be explained by the fact that this demographic is recognised as being perhaps the least responsive age group to any mode of survey (Dillman 2007). The BLA Birds in Backyards (BIBY) survey was distributed to 11,480 members of the BIBY program and a response rate of 23% was achieved, however, socio-demographic information for non-respondents was not available, therefore it was not possible to compare their characteristics with those of the Australian population.

	Demographic	Australian population	Social Values	BirdLife Australia
Gender	Female	50%	48%	50%
	Male	50%	52%	50%
Age	18-24	13%	11%	15%
	25-34	19%	21%	22%
	35-44	18%	21%	24%
	45-54	18%	17%	22%
	55-64	15%	13%	18%
	65+	18%	18%	n/a
Location	ACT	2%	2%	2%
	NSW	32%	33%	33%
	NT	1%	1%	1%
	QLD	20%	20%	19%
	SA	7%	8%	8%
	TAS	2%	2%	2%
	VIC	25%	25%	25%
	WA	10%	10%	10%

Comparison of the socio-demographic characteristics of survey non-respondents with those of the Australian population as a whole (ABS 2011a, 2012b) (Chapter 4).

Socio-demographic characteristics

Gender

There was a significant bias in the gender ratio of respondents within the three surveys (contingency table analysis, $\chi 2 = 59.25$, df = 3, p < 0.001) when compared with the characteristics of the Australian population as a whole. This difference was due to fewer males responding in the Social Values and BIBY surveys than expected compared with the Australian population, accounting for 96% of the overall chi-squared value.

Age

Examination of the partial chi-squared values indicated that the BIBY survey contributed substantially to the overall significant difference for the contingency table (98% of the overall chi-squared value) with 42% of the overall chi-squared value resulting from fewer participants aged between 18 and 44 responding and 56% of the overall chi-squared value resulting from more participants aged 45 and over responding than expected when compared with the characteristics of the Australian population as a whole (contingency table analysis, χ^2 =1365.59, df=15, p < 0.001).

Geographic location

Examination of partial chi-squared values indicated that the BIBY survey contributed to the overall significant difference for the contingency table (95% of the overall chi-squared value), with 57% of the overall chi-squared value resulting from more NSW respondents than expected and 36% of the overall chi-squared valued resulting from fewer than expected respondents from ACT, SA, Vic and WA when compared with the characteristics of the Australian population as a whole (contingency table analysis, χ^2 =415.91, df=21, p<0.001).

Highest level of education

Examination of partial chi-squared values indicated that the BA and BIBY surveys accounted for the overall significant difference for the contingency table (99% of the overall chi-squared value), with 90% of the overall chi-squared value resulting from more respondents educated to postgraduate degree level than expected and 9% of the overall chi-squared value resulting from fewer than expected respondents being educated to Year 12 or below when compared with the characteristics of the Australian population as a whole (contingency table analysis, χ^2 =2773.67, df=9, p=0).

Employment

Comparable employment data for the Australian population was not available, however, examination of partial chi-squared values for the three survey samples indicated that the SV and BA surveys drove the overall significant difference for the contingency table (88% of the overall chi-squared value), with 57% of the overall chi-squared value resulting from more respondents being employed as helpers, homemakers, primary caregivers or unemployed than expected, and 8% of the overall chi-squared value resulting from fewer than expected respondents conducting their own business when compared with the overall sample combined (contingency table analysis, χ^2 =220.39, df=14, p < 0.001).

Post hoc comparison of level of avicentrism and level of education

Post hoc comparisons of estimated marginal mean scores and 95% confidence intervals for levels of avicentrism and level of education revealed that only those with bachelors and postgraduate degrees did not differ in terms of anthropocentrism (p = 0.552), while all other educational categories differed from one another.

Level of education		Significance	95% confidence	interval
			Lower bound	Upper bound
Year 12	Trade certificate	0.018	0.0181	0.1890
	Bachelors degree	0.000	0.1832	0.3624
	Postgrad degree	0.000	0.2145	0.3872
Trade certificate	Year 12	0.018	-0.1890	-0.0181
	Bachelors degree	0.000	0.0775	0.2611
	Postgrad degree	0.000	0.1088	0.2860
Bachelors degree	Year 12	0.000	-0.3624	-0.1832
	Trade certificate	0.000	-0.2611	-0.0775
	Postgrad degree	0.552	-0.0645	0.1207
Postgrad degree	Year 12	0.000	-0.3872	-0.2145
	Trade certificate	0.000	-0.2860	-0.1088
	Bachelors degree	0.552	-0.1207	0.0645

Post hoc comparison of estimated marginal mean scores and 95% confidence intervals for levels of avicentrism and level of education (n = 3,689) (Chapter 4).

Appendix 3: Plain Language Statement

Plain Language Statement

Title:

Social Values of Australian Threatened Birds

Researcher: Gill Ainsworth, Charles Darwin University, PhD candidate

Purpose: This research seeks to examine the values and attitudes held by people in Australian society towards native birds in order to measure the importance placed by society on those birds and to identify the most effective conservation messages for threatened birds in Australia. Part of this research is connected to the ARC Linkage Project 'Increasing the effectiveness and efficiency of Australian threatened bird conservation.'

Benefits: Bird conservation is as much a social matter as it is ecological. This research will contribute to the preservation of native birds in Australia by deepening our understanding of the relationships between Australian attitudes, values and norms as regards birds and identifying which conservation messages are most effective in delivering successful conservation action. This information will help us to further understand our obligation to native birds from a national and international perspective. In practical terms it will prove invaluable for prioritising threatened species which appeal at both a policy and public interest level.

Participants will benefit from being involved in a national bird conservation research project which is aligned with their own interests. They will increase their knowledge of relevant bird conservation related information and can raise awareness of their local conservation activities (confidentially) through the research findings. The results of the research will form part of my PhD thesis.

You have been selected to participate in this research because of your interest in the conservation of threatened native birds. In order to make sure the most appropriate people take part in my research, I have a list of selection criteria which each participant needs to fulfill. Selection questions are mainly to ensure I have an appropriate mix of men and women, that all participants are adults over the age of 18, that participants are sufficiently fluent in English to fully discuss the issues covered by the research and that they have an interest in or knowledge of Australian threatened bird conservation.

Your role: If you decide to take part in this research your role will involve a one

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Valuing birds

hour face to face interview at a time and place of your choosing. The discussion will include questions about your values, attitudes and behaviours regarding native threatened birds, including question such as: what do threatened birds mean to you; what activities are you involved with in relation to threatened birds, including hobbies or conservation programs. Your interview will be digitally recorded by audio so that the information you provide can be accurately recorded then analysed at a later date. To ensure open and transparent review of the interview material, within a short period of the interview taking place you will receive a copy of the transcript for your review and approval. If you agree, photos may be taken of you which will be included in the research purely as examples or to demonstrate activities that are relevant to my research. No identifying information would be included unless you specifically requested it. Prior to submission or public release of any research results (in the form or a thesis or academic journal article) you will be provided with a copy of the material for your review.

- **Discomfort/risks:** There are no specific risks associated with this study. I simply want to hear about your experiences and opinions. I understand your time is valuable and will make every effort to conduct this research with you in a timely manner.
- **Confidentiality:** Every attempt will be made to maintain your privacy. All interviews will be digitally recorded however the recordings will only be used by me in my research thesis and possibly in related academic publications. You will not be referred to by name in any material published about the study or in any transcripts of the tapes, unless you specifically ask to be identified. If I use particular quotes, for example, I may refer to you as a code number or some other pseudonym. If you do want to be identified alongside direct quotes, I will send you the quotes that I plan to use and ask for your approval. In the case where photos or recordings may be used, all identifying information will be removed (unless you request to be identified). The image or recording will not be used out of context of this research or individually. As a requirement under the CDU Human Ethics Research Guidelines your data will be stored securely with restricted access at the university and will be destroyed after 5 years.

Participation:I would be grateful if you would participate in this research however
your participation is voluntary and you are free to refuse. Even if you do

agree to participate you may withdraw at any time by notifying me and terminating the interview. If you withdraw you can ask that your interview to that point be removed from the study.

Results: If you wish to have access to any of your material from the interview process, you are free to contact me to request it at any point. A transcript of your interview will be made available to you as a matter of course for your review. The result of this research is my PhD thesis which will be made available through the CDU library at the end of the research period (2013). You may also request to be notified of any academic publications where your data is included.

Contacts: If you have any questions about the project, please contact:

the researcher: Gill Ainsworth

on phone: 08 8946 7762

or email: gill.ainsworth@cdu.edu.au

This research is conducted following approval by the Charles Darwin University Human Research Ethics Committee (clearance # H10030). If, during the course of the project, you have any concerns about the project or the researcher, you may contact the Executive Officer of the Charles Darwin University Human Research Ethics Committee, who is not connected with this project and who can pass on your concerns to appropriate officers within the University. The Executive Officer can be contacted on 08 8946 6498 or by email: <u>cdu-ethics@cdu.edu.au</u>.

This information sheet is yours to keep

Appendix 4: Example of Interview Guide

Social Values of Australian Threatened Birds Interview Guide (Wildlife Managers)

Thank you for agreeing to be interviewed today as part of my PhD research. This research is associated with an ARC Linkage project which is being managed by Prof Stephen Garnett at CDU and Prof Hugh Possingham at UQ.

I am exploring several case studies of threatened species where there has been contrasting investment and outcomes for similar sorts of birds. This case study is comparing Baudin's and Carnaby's Black-cockatoos and you've been selected to participate in this research because of your interest in this area. I am also talking to a range of other key people including government and non-government representatives.

I anticipate that the interview will take approximately 1 hour. Is that ok with you? My questions will be exploring how people's attitudes towards threatened birds affect their conservation outcomes.

Your interview will be digitally recorded so I have an accurate record of your responses for my analysis. When I write up my findings, participants' responses will be aggregated to retain confidentiality and no identifying information will be included unless you specifically request it. A transcript of your interview will be made available to you in case you want to make any additions or changes.

You may withdraw at any time by notifying me and terminating the interview. If you withdraw you can ask that your interview to that point be removed from the study.

And finally, it's a condition of my human ethics approval that I ask for your permission to go ahead with this interview today.

Section 1 - Stakeholder analysis

During this first set of questions I'd like to find out more about your involvement in Baudin's/Carnaby's cockatoo conservation and the role of other organisations and individuals.

1.1 Please describe your interest in conservation of Baudin's/Carnaby's cockatoos

- can you tell me about your role in Baudin's/Carnaby's cockatoo conservation?
- would say you are connected to Baudin's/Carnaby's cockatoos as an individual or as part of your job or through an interest group?
- **1.2** Who would you consider to be the key organisations involved in conservation of the Baudin's/Carnaby's cockatoos?
 - is there any group or individual who is not being heard but should be?

Section 2 - Attitudes and beliefs about threatened bird and Baudin's/Carnaby's cockatoo conservation

The next few questions ask about values and attitudes towards threatened bird and Baudin's/Carnaby's cockatoo conservation. I'm interested in how people express their values in everyday language, so when answering these questions please feel free to voice your opinions as you would in any normal situation.

2.1 What got you involved with Baudin's/Carnaby's cockatoo?

- particular characteristics of the bird?
 - rarity: declining or small population, geographic range, probability of extinction?
- personal experience with the species?
- job?

2.2 What is most important to you about Baudin's/Carnaby's cockatoo conservation?

- role of science, community interest?
- are there any personal or social benefits arising from your involvement?
- is there anything negative about Baudin's/Carnaby's cockatoo conservation?
- how important is conservation of Baudin's/Carnaby's cockatoos to you compared with conservation of other local threatened species?

2.3 Do you personally believe that Baudin's/Carnaby's cockatoo conservation efforts will succeed or fail?

- what would most likely be the main driver behind that?
- can you describe what it would mean to you if that happened?
- might you feel the same way if conservation efforts for the (name of species mentioned in 2.5) succeeded / failed?

2.4 Is it important to you that a population of Baudin's/Carnaby's cockatoos exists in the wild, and if so, why?

2.5 What are the most important things you've learned from your involvement in Baudin's/Carnaby's cockatoo conservation?

- how might you advise others in a similar position to yours?

2.6 Could the local community influence conservation of the Baudin's/Carnaby's cockatoo? If so, how?

2.7 One of the reasons I am comparing Carnaby's and Baudin's cockatoos in this research is because one receives more in terms of conservation investment than the other. Why do you think this is the case?

The next few questions are about attitudes towards threatened birds in general.

2.8 How would you describe your own attitudes towards threatened birds in general?

- why are they important to you?
- what interests/attracts you about them most?

2.9 Do you think conservation of threatened birds is important to the Australian public?

- how could it be made more important?

2.10 Thinking about all sectors of Australian society, who do you think has most influence on threatened bird conservation and why?

2.11 What is their particular motive for conserving threatened birds?

2.12 Do you think the motivations people hold for conserving particular threatened birds can affect the success of conservation strategies for these birds?

- how might this apply to Baudin's/Carnaby's cockatoo?

2.13 If you could talk directly to people in general about the importance of conserving threatened birds, what would your message be?

Section 3 - Rarity and the role of flagships

The next few questions explore ideas about rarity and use of flagship species to aid conservation. I will now read out a definition of flagship:

'Flagship species are popular, charismatic species that serve as symbols and rallying points to stimulate conservation awareness and action.'

3.1 Do you agree in principal with that definition of a flagship species or is there another way you might describe it?

3.2 Do you think use of flagship birds is an effective way to educate the public about broader conservation issues?

- is public education necessary to improve conservation outcomes?
- could a flagship bird detract from wider conservation priorities (of politicians e.g.)?
- what could happen to public support if the flagship bird went extinct?

- o or was no longer threatened?
- is it preferable to use a landscape or ecosystem as a flagship for conservation?

3.3 Does Baudin's/Carnaby's cockatoo make a good flagship bird for your region?

3.4 Are there any other birds in your region that you think could make an effective flagship?

Section 4 - Sense of place / identity

Our attitudes and values tend to be learned at an early age and remain quite consistent throughout our lives. To help me better understand what motivates people to get involved in threatened bird conservation, if I may, I'd like to ask you a few general questions about your attitudes towards nature and how those attitudes might influence the role you play in conservation today.

4.1 Can you tell me who or what have been the major influences on your attitudes towards native birds?

- upbringing / parents / grandparents
- formative events
- religious teaching
- schooling

4.2 Can you tell me about the steps you took / what influenced you to get to the role you have in conservation now?

4.3 How did birds feature in that experience?

4.4 What do you value most about birdlife?

4.5 How does your interest in birds compare with your interest in other kinds of wildlife such as mammals or fish for example?

– what do birds give you that other kinds of wildlife don't?

4.6 Do you take part in any nature-based activities in your spare time, or have you done so in the past?

- who are you most likely to do these activities with?

4.7 Apart from the organisations you mentioned earlier to do with Baudin's/Carnaby's cockatoo conservation, are you currently or have you recently been a member of any other types of professional conservation organisations?

4.8 Is there anything else you would like to add about your attitudes towards threatened bird conservation in general or about Baudin's/Carnaby's cockatoo in particular?

Appendix 5: Summary of Key Differences - Yellow Chats

Summary and comparison of key informant attitudes towards the Yellow Chat subspecies based on key informant interview results (n=11) (Chapter 5).

	Yellow Chat (Alligator Rivers)	Yellow Chat (Capricorn)	
Community	Opportunities limited but potential for birdwatching and	Conservation community effectively engaged with potential for	
engagement	fishing community to contribute	birdwatching and fishing community to contribute more	
Involvement with	Little stakeholder or community interest; not a priority for	Encountered regularly; stakeholder interest driven by research	
taxon	conservation; 'part of role' rather than personal interest;	opportunities; individuals can influence conservation effort;	
	birdwatchers potentially interested but inhibited by lack of	promotion by BL Capricornia to birdwatching community has	
	information	created demand to see	
Conservation	Need for better biophysical and threat data; better stakeholder	Inherent right to exist and societal responsibility to preserve;	
priorities	engagement; community engagement helpful but neither	aesthetic, biophysical and ecological characteristics drive	
	supported nor desired	conservation action	
Conservation success	No conservation efforts being conducted resulting in both false	Discovery of populations inspired confidence; ongoing habitat	
or failure	sense of security and concern; climate change major unknown	preservation key concern; CQU's data could defend habitat	
	factor	protection	
Wild population	Important ecological function and indicator of ecosystem	Strong connection to habitat; intrinsic right to exist; benefit to	
	health; intrinsic right to exist; benefit to community	community	
Rarity	Conservation, ecological, mastery	Biophysical, conservation, ecological, mastery	
Conservation	The Capricorn subspecies has received greater conservation investment than the Alligator Rivers due to the contributio		
investment	research champion, support of a national birdwatching group, higher public profile and greater opportunities for the c		
imbalance	to engage in conservation efforts		
Potential flagship for	No: lack of awareness, restricted range, too difficult to	Yes, already promoted by BL Capricornia: relative accessibility,	
region	encounter, but could represent mangrove and tidal habitats	rarity, eye-catching appearance, typify marine plain wetland	
		environment, but limited distribution, small size detract	

	Yellow Chat (Alligator Rivers)	Yellow Chat (Capricorn)
Overall assessment	Minimal conservation effort due to low priority. No recovery	Moderate conservation investment. High priority taxon with
of conservation effort	plan, team or activities, little data and little community interest	recovery team, plan, ongoing research, conservation activities,
	Restricted range and remote habitat deter potential support.	adequately funded. Diversity of stakeholders effectively
	No support from birding or environmental organisations.	engaged. Taxon promoted to broader community by BL
		Capricornia. Potential for further community engagement.
Overall assessment	Population status unknown but thought to be stable. Climate	Local sub-populations mostly stable, except Curtis Island,
of conservation	change is a potential threat to its survival.	which is declining due to lack of habitat management.
status		Development is a potential threat to habitat.

Appendix 6: Summary of Key Differences – Migratory Parrots
Appendices

Summary and comparison of key informant attitudes towards the Migratory Parrot species based on key informant interview results (n=32) (Chapter 6).

	Orange-bellied Parrot	Swift Parrot
Community	Potential for community to contribute but more could be done	Potential for community to contribute but more could be done
engagement	in terms of joining community groups, preserving habitat,	in terms of joining community groups, preserving habitat,
	lobbying politicians, communicating to media or development	lobbying politicians, communicating to media or development
	proponents; community can negatively influence efforts if	proponents
	opposed to management strategies	
Involvement with	Majority took opportunity to work on it in current or new role;	Some got involved through existing conservation activities;
taxon	several have been involved for decades; controversial	some driven by commercial logging in Tasmanian forests; some
	circumstances catalysed one third to get involved; chance for	had personal experience and chose to get involved
	personal experience was a motivation for some due to rarity	
	and remoteness	
Most important	Monitoring population and understanding causes of decline;	Protection of habitat across range; complex natural history and
about conconvotion		
about conservation	Preservation of wild population; emphasis on managing winter	complicates management; different objectives reinforces lack
	habitat too strong, not enough attention to management of	complicates management; different objectives reinforces lack of trust between key Tasmanian stakeholders; emblematic for
	habitat too strong, not enough attention to management of breeding habitat or on research; ongoing captive breeding	complicates management; different objectives reinforces lack of trust between key Tasmanian stakeholders; emblematic for range of other species; moral responsibility to preserve the
	habitat too strong, not enough attention to management of breeding habitat or on research; ongoing captive breeding program essential; longevity of recovery team beneficial;	complicates management; different objectives reinforces lack of trust between key Tasmanian stakeholders; emblematic for range of other species; moral responsibility to preserve the species
	habitat too strong, not enough attention to managing winter habitat too strong, not enough attention to management of breeding habitat or on research; ongoing captive breeding program essential; longevity of recovery team beneficial; significant economic investment has been both a benefit and	complicates management; different objectives reinforces lack of trust between key Tasmanian stakeholders; emblematic for range of other species; moral responsibility to preserve the species
	Preservation of Wild population; emphasis on managing winter habitat too strong, not enough attention to management of breeding habitat or on research; ongoing captive breeding program essential; longevity of recovery team beneficial; significant economic investment has been both a benefit and curse; Commonwealth, state and local governments criticised	complicates management; different objectives reinforces lack of trust between key Tasmanian stakeholders; emblematic for range of other species; moral responsibility to preserve the species
	Preservation of wild population; emphasis on managing winter habitat too strong, not enough attention to management of breeding habitat or on research; ongoing captive breeding program essential; longevity of recovery team beneficial; significant economic investment has been both a benefit and curse; Commonwealth, state and local governments criticised for negatively influencing recovery efforts through restricted	complicates management; different objectives reinforces lack of trust between key Tasmanian stakeholders; emblematic for range of other species; moral responsibility to preserve the species
	Preservation of Wild population; emphasis on managing winter habitat too strong, not enough attention to management of breeding habitat or on research; ongoing captive breeding program essential; longevity of recovery team beneficial; significant economic investment has been both a benefit and curse; Commonwealth, state and local governments criticised for negatively influencing recovery efforts through restricted use of funding and inappropriate habitat management	complicates management; different objectives reinforces lack of trust between key Tasmanian stakeholders; emblematic for range of other species; moral responsibility to preserve the species

Conservation success Cautious optimism based on captive bred population viability Survival uncertain: stable population, positive conservation

	Orange-bellied Parrot	Swift Parrot			
or failure	and survival in wild; wild population has low chance of survival	efforts, improved forestry practices but many variables			
	due to recovery and community efforts but is highly vulnerable	affecting habitat including competing stakeholders, climate			
	due to lack of understanding of causes of decline and reliant	change and commercial logging; sense of separation between			
	on captive population to supplement breeding	Tasmanian and mainland stakeholders			
Wild population	Existence is ultimate measure of success; obligation to protect	Strong emotional response to seeing and hearing in wild and			
	for past and future generations; ecologically important;	strongly connect to places they inhabit; intrinsic right to exist;			
	intrinsic value and uniqueness; relationship to saltmarsh	reluctance to see in captivity although aviculturists appreciated			
	habitat; captive birds are museum pieces	for contributing breeding knowledge			
Conservation	Greater investment due to stronger and longer level of comm	unity effort driven by several factors relating to opportunity to			
imbalance	observe at Melaleuca; champions; rarity, uniqueness and elusiveness; connection to wilderness habitat; thrill strong social interest due to high public profile and polarised views; funding mostly justified but not all wisely a				
Rarity	Rapid decline and critically small population incentives to				
	action because of urgency; doubts about genetic viability of				
	wild and captive populations crate knife-edge effect and lend				
	importance over other species and sense of duty; personal				
	satisfaction at being able to contribute to knowledge but				
	regret at not acting sooner; rarity generates community				
	interest but maintaining interest is difficult when unlikely to				
	encounter and challenges with expert / public knowledge				
Key or iconic species	OBPs draw attention to their particular habitats and other	Draw attention to their particular habitats and other species			
	species that use the same habitat. Particularly important from	that use the same habitat. Symbolic of old growth Blue Gum			
	a tourism perspective because they are part of the diversity	forests due to their need for large nest hollows in these species			

	Orange-bellied Parrot	Swift Parrot
	and uniqueness of Tasmania, which people will fly to	of trees. One environmental non-government organisation
	Melaleuca to see.	'iconises' the Swift Parrot as a particularly special and
		threatened species by referring to it in media or other
		communications about protection of old growth forests. They
		have special characteristics that are easy to relate to such as
		speed, familiarity and distance travelled.
Potential flagship for	Good for coastal saltmarsh habitats; charismatic, beautiful,	Good for many threatened ecological communities and
region	rare, of concern across a number of states, interesting life	species; unpredictable requirements encourages holistic
	history and high public profile but potential to be misused due	approach to conservation and large range means wide range
	to bad press	of habitats need to be protected; physically engaging and easy
		to relate to, fairly readily encountered; migratory nature is
		appealing; relatively high public profile; good indicator of
		climate variability
Overall assessment	OBP has longest running recovery program in Australia,	Swift has well-established national recovery team, plan,
of conservation effort	benefits from members' experience, knowledge. It has	recovery effort supported by diverse range of stakeholders,
	attracted significant conservation investment from all levels of	funding, community projects. Conservation challenges include
	government, community, especially volunteers, landholders	overall complexity of species' biology, management
	within winter habitat range. However program has not focused	requirements and psychological, physical divide in
	enough attention on preservation of breeding population,	conservation effort between mainland and Tasmania. Historic
	especially management of habitat, understanding causes of	feud over logging of Tasmania's old growth forests means
	decline, but instead invested considerably in protection of	tensions exist between government, non-government
	winter habitat, developing insurance population in captivity	stakeholders in Tasmania. Swift is fairly readily encountered

	Orange-bellied Parrot	Swift Parrot
	which could ultimately result in extinction of wild population.	and physically attractive so people feel strong emotional
	OBP suffers to some extent from negative association with	response to seeing, hearing it and connection to places it
	land-use planning, can polarise views which deters community	inhabits. Has high public profile, successfully promoted as
	support. This has created situation whereby significant	flagship for broad-scale woodland conservation across south-
	government funding allocated for conservation but restricted	eastern Australia. On-ground conservation activities reliant on
	to 'non-priority' activities simultaneously giving the impression	large number of volunteers
	that species is over funded but ineffectively managed. Rapid	
	decline, critically small population incentives for conservation	
	action, lend it importance over other threatened species, but	
	also make it more challenging to maintain community interest	
	when likelihood of encountering it very low. OBP is good	
	flagship for saltmarsh habitats but open to misuse	
Overall assess	ent Despite longevity, experience of recovery team, significant	Swift population perceived as stable, conservation efforts on
of conserva	tion conservation investment, status has significantly declined in	positive trajectory, particularly due to improved forestry
status	recent years, extinction in wild is imminent. Although recovery	management practices in Tasmania. However, it faces many
	team members view survival in wild as measure of	challenges including that not all stakeholders working
	conservation success, due to misdirection of efforts	cohesively, has complex natural history, unpredictable
	preservation of the species is reliant on genetic viability of	management requirements are exacerbated by climate
	captive bred population, successful reintroduction into the	change, commercial logging of habitat which make long term
	wild in face of ongoing threats to habitat	survival in wild uncertain

Appendix 7: Summary of Key Differences – White-tailed Black-cockatoos

Summary and comparison of key informant attitudes towards the Black-cockatoo species based on key informant interview results (n=31) (Chapter 7).

	Baudin's Black-cockatoo	Carnaby's Black-cockatoo
Community	Farming, fruit growing community species negatively; little	Many different sectors of community can play direct role in
engagement	public support because few people know Baudin's is separate	conservation including developers, volunteers, landholders
	species from Carnaby's, even fewer can tell the two apart	
Involvement with	Some knew from childhood, got involved when learned of	General interest in cockatoos led to involvement for some;
taxon	status; others got involved as part of role	others got involved as part of new role; handful familiar from
		childhood
Most important about	Protection of habitat is key conservation objective; improve	Protection of habitat is key conservation objective; large cross-
conservation	knowledge about habitat, food requirements, population size,	section of community interact with species so opportunities
	dynamics; major threat is landscape change due to climate	for engagement through public pressure on government,
	change, fire, tree diseases, canker - compounded by logging,	landholders preserving remaining habitats; considered iconic,
	mining; cease illegal shooting by orchardists	umbrella species for broad range of habitats, species; large
		network of stakeholders but not all on same page
Conservation success	Numbers will decline in next few decades and never recover	Things will get worse before they improve; Carnaby's may
or failure	due to lack of data on population, habitat requirements,	survive at expense of Baudin's; adaptability is advantage in
	pressure on habitat from forest management practices,	seeking food resources in expanding range; population size is
	mining, combination of illegal shooting and aging population	advantage; public awareness, conservation investment from
		BLA and elsewhere lift chances of success but change of
		government may be required
Wild population	Important contribution to ecological history, fabric as	Important contribution to ecological history, fabric as
	ecosystem engineers; well-loved by those who know them;	ecosystem engineers and contribution to social history, fabric;
	special part of lives; spectacular sight and sound, interesting	well-loved by those who know them; special part of lives;

	Appendices				
	Baudin's Black-cockatoo	Carnaby's Black-cockatoo			
	behaviour, intelligence; inherent right to exist	spectacular sight and sound, interesting behaviour,			
		intelligence; inherent right to exist			
Conservation	Carnaby's has received far greater conservation investmen	t than Baudin's: number of published studies, stakeholder			
imbalance	involvement, community engagement, public profile; due to Saunders' decades' long research, ease with which they ca				
	studied compared with Baudin's, emotion they evoke in rese	earchers; Carnaby's fits BLA's organisational philosophy; more			
	readily triggers EPBC Act than Baudin's so more referrals there	efore higher public profile, focal point for political pressure in			
	Perth				
Rarity	Perception of rarity alone is not driving attitudes and	Perception of rarity alone is not driving attitudes and			
	behaviour that lead to effective conservation efforts	behaviour that lead to effective conservation efforts			
Key or iconic species	Considered iconic. Strongly associated with particular place or	Considered iconic. Strongly associated with particular place or			
	time, has interesting folklore in region and appealing physical	time, has interesting folklore in region and appealing physical			
	characteristics, e.g. unique, large, noisy or visible but, more	characteristics, e.g. unique, large, noisy or visible but, more			
	importantly, charismatic or engaging	importantly, charismatic or engaging			
Potential flagship for	Good flagship for forest habitat because visible in forests;	Already considered good flagship due to enormous public			
region	most West Australians able to see them there but inadequate	appeal, relevance across large geographic range			
	knowledge about needs and pest status disadvantageous				
Overall assessment of	Baudin's has combined recovery team, plan, three public	Carnaby's has dedicated recovery team, plan, public			
conservation effort	champions but very limited resources. All except two recovery	champion, diverse stakeholder support, far greater			
	team members are state government representatives;	conservation investment received than Baudin's. Although			
	DAFWA, WAFGA noticeably lacking from recovery efforts,	most recovery team members are state government			
	implications for management due to pest status. Few active	representatives, other relevant interests represented.			
	stakeholders, receives minimal conservation investment,	Receives significant conservation, research investment.			

	Baudin's Black-cockatoo	Carnaby's Black-cockatoo
	suffers from being confused with Carnaby's. Little known	Because Carnaby's comes into Perth metropolitan area which
	about Baudin's since relatively few people working on it and	is undergoing rapid urban development, EPBC Act triggers
	lack of knowledge about requirements means basic data about	much clearer than for Baudin's, this results in greater
	biology and ecology is still being gathered. Several affected	awareness, better policy, effort to separate potential impacts
	government parties with conflicting interests makes its	from protecting species. Relatively large number of people
	management highly political. Has low public profile, is mostly	working on Carnaby's, because studied over a number of
	perceived as pest by orchardists, some of whom shoot it	decades, researchers able to explore more specialised aspects
	illegally for damaging crops despite there being alternative	of biology, ecology of species. Carnaby's has been focus of BLA
	non-lethal deterrent techniques available. Population	recovery project because: good candidate for citizen science,
	declining, lack of conservation investment, social interest	engaging different sectors of community. Has high public
	mean poor outlook for survival	profile, known to large cross-section of society across diverse
		range of tenures so community can contribute to conservation
		in variety of different ways. Conservation outlook positive due
		to adaptability
Overall assessment of	Listed nationally as 'Vulnerable' and in WA as 'Rare or likely to	Listed nationally as 'Endangered' and in WA as 'Rare or likely
conservation status	become extinct' due to significant population decline, major	to become extinct' due to significant population decline and
	threats to habitat. But also declared horticultural pest, illegal	major threats to habitat. However is adaptable species and
	shooting by orchardists devastating already ageing population.	expected to survive over long term with some localised
	If business as usual, expected to go extinct within next few	population extinctions in Perth and Wheatbelt areas
	decades	

Appendix 8: Attitudes towards Native and Threatened Birds

Value	No. of		No. of	
orientation	comments	Statements about native birds	comments	Statements about threatened birds
Aesthetic	9	Being colourful is an advantage (4); appreciate their	0	
		beauty (4); some are powerful; aesthetic interest		
		beyond scientific interest		
Biophysical	16	Appreciate variety of species/physical characteristics	6	Interested in breeding threatened species;
		(5); interesting life histories, e.g. migration (4); being		biophysical similarity between species may help me
		diurnal is an advantage (2), so easier to work on than		identify how to improve status; working life devoted
		other wildlife; good research animals (2); very		to studying birds; interested in science and gaining
		abundant; am interested/knowledgeable about birds		knowledge on birds; really interested in rare birds
				with tiny populations or geographically isolated;
				interesting behaviour
Conservation	6	Popular group to communicate conservation	17	Threatened birds are useful for engaging people in
		messages/effect change (2);		conservation/ challenging people about whether
		community involvement in bird censuses useful to		they want species to go extinct (2); birds are useful
		other species living in same sorts of habitats; common		for landscape conservation especially where other
		birds become uncommon very quickly; we should be		wildlife has disappeared; you can showcase species
		studying and investing in common declining species		and present issues to the community; threatened
		because once they're threatened they become very		bird programs make it very easy to engage with
		expensive and time-consuming; interested in		people outside the department;
		processes that lead to birds becoming threatened		there's a lot of interest so we get some good

Summary and comparison of key informant statements about native and threatened birds based on combined case study interview results (n=74), (blank cells indicate no statements were made) (Chapters 5 - 7).

Value	No. of		No. of	
orientation	comments	Statements about native birds	comments	Statements about threatened birds
				research done; if I knew more about them I could
				raise awareness about them with my tour groups;
				protecting bird habitat can protect habitat for many
				other species; really interested in how we can
				mitigate disturbance effects; important because they
				represent threatening processes that we need to
				better control; interested in why some species are
				threatened in some places but not others;
				it's frustrating that we don't have the resources to
				conserve species; we must try but the rational part
				of me says that the probability of conserving species
				is very low; there are a lot of special species on the
				threatened species list;
				wouldn't like to work on non-threatened species; the
				most important thing I can do with my life is work
				towards protecting the natural world; birds initially
				got me interested in conservation
Ecological	9	Interested in ecological role (3); common species can	2	Loss of any element from an ecosystem weakens the
		help to understand the ecology of a place (2); good		whole ecosystem; if birds are threatened there's
		research animals; keen naturalist; useful to learn about		some sort of decline in ecosystem health
		disturbance ecology; important part of ecosystem		

Value	No. of		No. of	
orientation	comments	Statements about native birds	comments	Statements about threatened birds
Experiential	40	Very visible (10); enjoy seeing/watching birds (6);	6	Enjoy seeing a variety of species; privilege and
		obvious/vital part of the landscape/bush/ecosystem		reward to see threatened birds in the wild; my role
		(5); easier to detect than other wildlife (3); very		means I can experience nature in ways that other
		accessible (3); have been around birds all my life (2);		people can't; I'm very lucky to have an exciting and
		easy way to interact with environment (2); working		fun job where I work with such amazing things; meet
		with birds has been a great experience/increased my		people from all over the world; the planet's a poorer
		interest (2); audible; always surprising and engaging to		place for every species lost
		see what turns up;		
		plenty of other people to get excited about birds with;		
		important part of people's experience of the world;		
		would like to see as many species as I can; large		
		numbers and abundance of species got me interested;		
		exciting to find little known, rare bird		
Humanistic	26	Engaging behaviours (5); people are very passionate	11	I get upset about loss of species, declines, extinctions
		about/interested in birds (6); fond childhood		(2); feel empathy towards them, because they are in
		memories of birds (3); girlfriend/parents/naturalist		trouble and you want them (2); threatened birds are
		mentor encouraged interest (3); awe		a huge concern, same as any threatened species; I try
		inspiring/charismatic (3); connection with		to use science to prevent extinctions, but it's an
		nature/sense of place (2); public relates to birds more		emotional thing; childhood memory of watching
		easily than other groups, e.g. nocturnal (2); passion for		environmental declines; my reasons vary depending
		the environment, nature; interested in familiar birds		on my mood from self-interest at a genetic level to a

		Appendices		
Value	No. of		No. of	
orientation	comments	Statements about native birds	comments	Statements about threatened birds
		from home		selfish superficial perspective; some people think
				birds are more important than anything else; we
				want to protect all threatened species if we can;
				birds are a good way of engaging with landholders
				because they like having them around and notice
				when species aren't there
Intrinsic	2	There's a place for all of it; everything has a right to	1	I want to keep them here for future generations
		exist in the wild		because of their intrinsic value
Mastery	6	Like to see new birds and add them to my list (2); best	4	Threatened birds attract your attention more;
		known group of wildlife in Australia; field guides		looking for rarity, most scarce; exciting trying to find
		available; contributed to educational collections; try to		them; my tour groups want to see threatened birds
		see new birds if in a new country		and I'm interested in seeing them; a lot of people
				know about Gouldian Finch and have it in their
				aviaries because it's a magnificent bird
Moral	3	Humans should learn to share; don't like the idea that	19	Don't want species to go extinct on my watch (2); if I
		anything is threatened; hate that humans have		don't do anything I can't expect anyone else to; I
		imposed on anything in the natural environment		have a statutory responsibility to protect threatened
				bird species; people will look back and say 'I'm never
				going to get to see that thing' so that drives me to
				work in conservation; I should probably know more
				about the threatened birds in the region because of

Value	No. of		No. of	
orientation	comments	Statements about native birds	comments	Statements about threatened birds
				my work; the idea of things being extinct is abhorrent
				to me if it's our fault; I want to 'fight the good fight'
				and keep them here for future generations;
				Australia has a poor track record for extinctions;
				we have a responsibility to look after the biodiversity
				of the planet; listing threatened species is a valuable
				report card for societies, governments and countries
				to be held accountable; we need to be controlling
				threatening processes better or we will continue to
				lose lots of species;
				because they're threatened we need to do
				something about them; once it's gone every
				generation has lost something;
				it's a shame when we lose something if we haven't
				put enough effort into saving it;
				they should be part of the landscape in perpetuity;
				nothing should go extinct; it seems wrong to give up
				on species just because they are genetically extinct;
				important to conserve all threatened species
Symbolic	5	Majestic; free; emblematic; iconic to humans for	1	Good icons for conservation
		spiritual and natural reasons; flagship, iconic birds		

Valuing birds

	Appendices				
Value	No. of		No. of		
orientation	comments	Statements about native birds	comments	Statements about threatened birds	
		essential from marketing perspective			
Utilitarian	2	More research opportunities for birds than other	6	Need to act now to avoid pouring money into	
		wildlife; benefitted from working with explorer		terminal projects (like the OBP); makes us think	
		naturalists		about whether to give up on species because they're	
				not a good investment anymore; need to invest in	
				species where we can make a difference; I'd hate to	
				see a lot of money thrown at a species just because $\ _$	
				it's noisy; don't think we can ever get away from self	
				interest in nature and what we choose to conserve; I	
				can use threatened birds to sell my bird tours	

Appendix 9: Stakeholder Contribution to Case Study Taxa Conservation Efforts

Comparison of key stakeholders for the six case study taxa by contribution to conservation efforts based on case study interview results (n=74) (Chapters 5-7).

Stakeholder role	Alligator Rivers Yellow Chat	Capricorn Yellow Chat
Public champions	None	Recovery team***, Houston***
Supporters	DLRM*, DSEWPaC*, KNP*	DEHP**, FBA & other NRM agencies**, pastoral leaseholders & freeholders**, QPWS**, salt refinery**, ADF*, DSEWPaC*, Jaensch*, Melzer*, 12 Mile Creek catchment management group*
Affected but inactive	Mary River NP*, Aboriginal Land Trusts*; birdwatching & fishing community*	EPA*, shire councils*; Indigenous groups*
Disadvantageous	None	Mineral and grazing leases in Fitzroy Delta**
Others	Armstrong*, Woinarski*	Birdwatching and fishing communities**
Stakeholder role	Orange-bellied Parrot	Swift Parrot
Public champions		
	BLA***, Holdsworth***, OBPRI***	BLA***, SPRT***, Tzaros***
Supporters	Captive breeding facilities***, volunteers***, CMAs**, Melbourne Water**, NRMAs**, Parks Victoria**, universities**, community groups*, EPA*, landholders*, local government*, schools*	BLA***, SPRT***, Tzaros*** FPA***, universities***, volunteers***, community groups **, conservation land managers**, Environment Tasmania*, NRMAs**, TWS**, WWF-Australia**, TCT*, Green Institute*, Industry partners*, private landholders*
Supporters Affected but inactive	Captive breeding facilities***, volunteers***, CMAs**, Melbourne Water**, NRMAs**, Parks Victoria**, universities**, community groups*, EPA*, landholders*, local government*, schools* AFMA*, ADF*, Indigenous groups*	BLA***, SPRT***, Tzaros*** FPA***, universities***, volunteers***, community groups **, conservation land managers**, Environment Tasmania*, NRMAs**, TWS**, WWF-Australia**, TCT*, Green Institute*, Industry partners*, private landholders* Cwlth Government landowners**, Indigenous groups*, LGAs*
Supporters Affected but inactive Disadvantageous	Captive breeding facilities***, volunteers***, CMAs**, Melbourne Water**, NRMAs**, Parks Victoria**, universities**, community groups*, EPA*, landholders*, local government*, schools* AFMA*, ADF*, Indigenous groups* Politicians***, grazing leases**, media**, mining & other resource extractors**, wind farms**	BLA***, SPRT***, Tzaros*** FPA***, universities***, volunteers***, community groups **, conservation land managers**, Environment Tasmania*, NRMAs**, TWS**, WWF-Australia**, TCT*, Green Institute*, Industry partners*, private landholders* Cwlth Government landowners**, Indigenous groups*, LGAs* Forestry Tasmania***, agricultural land managers**, developers**

Stakeholder role	Baudin's Black-cockatoo	Carnaby's Black-cockatoo
Public champions	FBCRT**, Johnstone*, Kirkby*	CBCRT***, Saunders***
Supporters	Perth Zoo**, Water Corporation**, consultants*, landholders*, media*, universities*, volunteers*, wildlife rescue*	BAWAPAG**, CBCRP**, CBCRG**, DPWA**, landholders**, media**, NRMAs**, Perth Zoo**, volunteers**, community groups*, consultants*, universities*, wildlife rescue groups*
Affected but inactive	DAFWA**, DPWA**, LGAs**, WAFGA**	LGAs**, Indigenous groups*, Real Estate Institute WA*
Disadvantageous	FPC***, mining companies***, orchardists***	FPC***, mining companies***, agricultural land managers**, illegal egg collectors*
Others	Tourism operators*	Perth city inhabitants**

Public champions = take a leading role in conducting conservation activities for the taxon; Supporters = major contributor to conservation; Affected but inactive = affected party but do not contribute directly to conservation; Disadvantageous = conduct potentially detrimental activities; Others = contribute to awareness and knowledge. ***Significant influence; **Moderate influence; *Minimal influence in terms of the strength of support or opposition, resources available to them or extent of decision-making power or influence in relation to conservation effort.

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