

Knowledge of birds and willingness to support their conservation: an Australian case study

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Summary

This case study concentrates on the extent of knowledge among the Australian public of Australia's tropical bird species, and their willingness to support their conservation. In order to place this issue in context, we provide background information on the status of Australian bird species, focusing attention on species that occur in tropical Australia. Then, using questionnaire survey results, we consider the hypothesis that the public's support for the conservation of different bird species depends on their understanding of the species' existence and status. Based on results from a sample of residents in Brisbane, Queensland, we found that knowledge of bird species that occur exclusively in the Australian tropics (including tropical Queensland) was very poor compared with that of those occurring in the Brisbane area that are relatively common. Experimental results indicated that when respondents in the sample had an option to allocate A\$1,000 between 10 bird species listed in the survey, they allocated more funds to the better-known and more common species, unless they were provided with balanced information about all the selected species. With balanced information, the average allocation to bird species confined mostly to the Australian tropics, particularly those threatened, increased. This demonstrates the conservation implications of information provision about bird species. The results showed that public education can play a crucial role in attempts to conserve bird species that are poorly known and threatened.

Introduction

Knowledge of wildlife species not only enables the public to better appreciate and enjoy wildlife but may also encourage the public to protect and conserve it, especially species that are threatened. In the absence of such knowledge, the satisfaction the public could derive from wildlife may be low, or even zero in the case of species unknown to the public. As a result, economic and other values placed by the public on wildlife species that are poorly known are likely to be lower than otherwise. Furthermore, increased appreciation of wildlife, especially threatened species, leads to greater support for their conservation and increases the memberships of organizations that help protect and conserve wildlife.

Of the 780 species of birds recorded in mainland Australia (based on Christidis and Boles 1994 by Simpson *et al.* 2003), approximately 42% are endemic to Australia, including breeding endemics such as Short-tailed Shearwater *Puffinus tenuirostris*, Australian Pelican *Pelecanus conspicillatus* and White-necked Heron *Ardea pacifica* (Marchant and Higgins 1990, 1993, Simpson *et al.* 2003). Furthermore, around 18% of Australian bird species are confined to the tropics and of these 43% are

endemic.¹ By comparison, 27% are confined to subtropical and temperate areas (constituting more than 60% of Australia's land area) and 64% of these are endemic. Of the species confined to Australia's tropical north, 32% are uncommon or rare and a significant number of these are endemic (e.g. Gouldian Finch *Erythrura gouldiae*, Golden-shouldered Parrot *Psephotus chrysopterygius* — two species selected for the questionnaire survey). Many species confined to the tropics are further restricted to a particular bioregion (e.g. a rainforest in the wet tropics or savanna) and live almost nowhere else. A few of these species were included in the questionnaire survey (Table 1).

Despite Australia's large size, many birds are under threat as a result of cattle and sheep grazing, large-scale clearing of land for agriculture, irrigation, spreading land degradation due to soil salinity, urbanization and introduced mammals. Illegal trapping of colourful species for the pet trade and introduced exotic birds are also of concern (Garnett and Crowley 2000).

Without greater public support for bird conservation in Australia many bird species will continue to disappear. An understanding of the extent of the public's knowledge of birds, and which species are likely to be supported by the public given their current knowledge, is useful in addressing some of these threats. Furthermore, it is important to determine what role the provision of additional information to the public could play in shifting support (monetary or otherwise) between species.

Few studies have shown how the provision of balanced information to the public shifts support (monetary or otherwise) from common species to threatened ones. Randall *et al.* (1974) recognized the potential role information provision can have on value estimates obtained using the contingent valuation method (CVM), but this study was not specific to any particular species. Samples *et al.* (1986) showed how an individual's reported willingness to pay (WTP) to protect a particular (non-bird) species was influenced by the provision of information about it and its threatened status. This work was conducted using separate control groups. In our study, we cover a range of tropical species that are both common and threatened from a questionnaire survey with participants of diverse socio-economic backgrounds, to assess support for the conservation of species. A unique aspect of this study is that it assesses support both before and after the provision of balanced information.

The aim of this study was to examine the Brisbane public's knowledge of bird species occurring in Australia's tropical north and their willingness to support their conservation. This issue is worthy of study because the majority of Australia's 20 million population live below the Tropic of Capricorn along the eastern coast and hence may be unaware of the existence of bird species that are confined to the tropical north, occupying specialized habitats. Insufficient knowledge about bird species could result in little or no support for their protection and conservation, which may be crucial in influencing government and some non-governmental organization (NGOs) decisions about the conservation of birds.

¹ These estimates have been obtained by examining the distributional maps of 705 species of Australian birds listed in Simpson *et al.* (2003). Introduced species and vagrants listed in the *Vagrant Bird Bulletin* by Simpson *et al.* (2003) have been excluded. Furthermore, those species that did not have a distributional map in Simpson *et al.* (2003) have also been excluded from the analysis.

Table 1. Species status, endemism, their distribution in Australia and whether the species were known to the participants prior to survey 1.

Species	Distribution in Australia	Endemism	Status	Species known by the survey participants	
				Yes (%)	No (%)
Southern Cassowary <i>Casuarius casuarius</i>	North Qld	At least two subspecies one of which is not endemic to Australia	Uncommon and threatened	87	12
Brolga <i>Grus rubicundus</i>	Qld, NT, WA, NSW, VIC, SA	Not endemic to Australia	Uncommon or rare except in northern Australia	80	19
Laughing Kookaburra <i>Dacelo novaeguineae</i>	Qld, NSW, ACT, VIC, Tas, WA	Endemic to Australia	Common	96	3
Australian Magpie <i>Gymnorhina tibicen</i>	All States and Territories	Seven subspecies endemic to Australia and onesubspecies found in PNG	Common	96	3
Red-tailed Black Cockatoo <i>Calyptorhynchus banksii</i>	Qld, NSW (similar subspecies in other States)	Five subspecies endemic to Australia	Common	80.5	19
Palm Cockatoo <i>Proboscigera aterrimus</i>	North Qld	Of the four sub species one is endemic	Common in its restricted range	30.5	68
Eclectus Parrot <i>Eclectus roratus</i>	North Qld	Of the two subspecies one is endemic	Common in its restricted range	22.5	75
Golden Bowerbird <i>Ptilonorhina newtoniana</i>	North Qld	Endemic to Australia	Common in its restricted range	47	51
Golden-shouldered Parrot <i>Psephotus chrysopterygius</i>	North Qld	Endemic to Australia	Population seriously depleted and threatened	27	71
Gouldian Finch <i>Erythrura gouldiae</i>	North Qld, NT, WA	Endemic to Australia	Population seriously depleted and threatened	44	55

Sources: The definitive source is *The Handbook of Australian, New Zealand and Antarctic Birds* (Marchant and Higgins 1990, 1993, 1999). However, Dr Stephen Garnett has also provided some information in addition to the following sources that were consulted: Morcombe (2000); Pizzey and Knight (1998) and Reader's Digest (1997). NSW, New South Wales; NT, Northern Territory; Qld, Queensland; SA, South Australia; Tas, Tasmania; VIC, Victoria; WA, Western Australia.

Methods

In all, 10 species of Australian birds were selected (Table 1) for the section on birds in the questionnaire survey. Since the study concentrated on studying the valuation of Australia's tropical wildlife, it was necessary to select a significant proportion of species found only in northern tropical Australia. In order to make comparisons between common and threatened species two common birds in Brisbane suburbs were included (Australian Magpie *Gymnorhina tibicen* and Laughing Kookaburra *Dacelo novaeguineae*). Three threatened species were also included.

The survey among Brisbane residents was conducted during July–September 2002 to gauge public knowledge of Australia's tropical wildlife, their willingness to conserve wildlife, and the economic and other values they place on different species. These were then related to the participants' perceived knowledge of bird species in the survey and subsequent changes in their knowledge.

Publicity about the survey was given through letter drops and local newspapers. Respondents were drawn from high- and low-income suburbs. The real aim of the survey was not revealed in order to avoid bias. The wording of the advertising material concealed the objectives of the survey while also trying to make the survey attractive to potential participants. The wording used was as follows: "Purpose of study: to provide your opinions about the use of natural resources in tropical Australia by filling out a survey form".

It was mentioned that the first survey would take approximately 2 hours to complete and would include a lecture and completing a survey form. Two sessions were scheduled for a weekday, two on a Saturday and a fifth on a Sunday in order to make the survey more appealing to a wide group of participants. In the distributed material, participants were promised A\$20 for their participation plus free parking or reimbursement of any public transport costs. Participants were promised that they would be eligible to enter a draw to win a prize of A\$200 if they returned the second survey form.

The intended target sample size of the group was 200 and the responding participants were selected on a first-come first-served basis. Our sampling was purposive and our objective was to obtain a sample that was representative of Brisbane residents in terms of age, gender and income distribution. An examination of the socio-economic data collected from the participants confirmed that the sample obtained was diverse.

In order to avoid the problem of last-minute cancellations and dropouts, the number of selected participants for each age group was set around 10% more than the required number of participants. In all, 204 Brisbane residents took part in the survey and they were divided into groups of about 40 persons for each session.

Prior to the survey the questionnaire was pre-tested among 20 undergraduates and their comments were sought. The experimental study was conducted in two stages. The first hour was devoted to filling out a structured questionnaire. The aim was to gather background information and current knowledge about Australian wildlife, as well as the monetary values they placed on species, from a hypothetical allocation of money. Before the first survey commenced the respondents were given clear instructions about filling out the survey form and the areas of tropical Australia were shown. Most respondents took approximately 45–60 minutes to complete the first evaluation questionnaire survey (survey I), while a few took a little longer (approximately 10–15 minutes). Once the second stage of the survey commenced, the

respondents were provided with a second evaluation questionnaire survey (survey II), which consisted of similar questions to the survey I together with a few additional questions. This was intended to measure the changes in participants' behaviour before and after the provision of information. A colourful brochure dealing with the current status of Australian birds, their geographical range, a photograph for eight species and other background information was also provided for these species. The two species for which information was not provided were Australian Magpie and Laughing Kookaburra, two common birds found in most Brisbane gardens/suburbs. The selected Australian wildlife for the survey consisted of mammals, birds and reptiles and was in separate sections of the questionnaire.

The information provided in the brochure was sourced from Morcombe (2000), Pizzey and Knight (1998) and Reader's Digest (1997). These sources were selected because they were readily available to the public. The participants were asked to fill out the second questionnaire once they got back home and to return the completed survey forms to the authors in the self-addressed stamped envelope within 2 weeks. Following a tea break after the first survey we invited Dr Steven Van Dyck, Curator of Mammals and Birds of the Queensland Museum, to give a presentation on Australian tropical wildlife. He made a 45 minute presentation illustrating his talk with slides, video clips and skins brought from the Queensland museum. In his presentation he placed particular emphasis on the Mahogany Glider *Petaurus gracilis*. However, Dr Van Dyck also gave a brief introduction to Australian birds and demonstrated the colourful birdlife in Australia by showing skins of Eclectus Parrot *Eclectus roratus*. He spoke primarily on mammals, especially Mahogany Glider, because the survey was on Australian tropical wildlife and because of time constraints. However, detailed information was provided for the selected bird species in the booklet provided as mentioned earlier.

Results

Of the 204 participants, 66% were born in Australia. Of those born outside Australia, 3.4% had lived in Australia for more than 50 years and 8% for less than 10 years. Of the participants 55% were female and 45% were male. Only 18% said that they were members of a nature conservation organization, with only 2.5% of respondents declining to answer. Interestingly, none of the participants were members of a conservation organization dedicated to the protection and conservation of birds in or outside Australia. Furthermore, only 1% of the respondents had read *Wingspan*, the official journal of Birds Australia, during the past year. However, these statistics are not surprising given the low membership figures of Australian NGOs devoted to birds, including Birds Australia.

It was found that the general knowledge of birds among respondents was poor, especially of those birds that were restricted to isolated pockets in tropical Australia, despite almost all the birds chosen being colourful and some of them being threatened. Locally common birds in Brisbane were well known by the participants (Table 1). For example, approximately 96% of the participants knew of the existence of Australian Magpies and Laughing Kookaburras. Interestingly, a small number (approximately 3%) did not know of their existence. Other well-known birds were Southern Cassowary *Casuarius casuarius*, Brolga *Grus rubicundus* and Red-tailed Black Cockatoo *Calyptorhynchus banksii*, all known by more than 80% of participants. This

may partly have been because they are common exhibits in many zoos and theme parks in Queensland and other States, and partly because the former two are large birds and are the subject of several Australian children's stories. Red-tailed Black Cockatoo is sometimes regarded as an agricultural pest and can be seen in some national parks and nature reserves close to Brisbane. In contrast, birds restricted to the top end of Australia (e.g. Gouldian Finch) or restricted to some areas of north Queensland (e.g. Golden Bowerbird *Prionodura newtoniana*, Palm Cockatoo *Proboscigera aterrimus*, Eclectus and Golden-shouldered Parrots) were less known. Gouldian Finch, although a colourful aviary bird displayed in zoos and theme parks, was also poorly known. Eclectus Parrot is one of the most brightly hued birds in Australia and is frequent in zoos and theme parks, but was the most poorly known of the bird species (Table 1). Perhaps the marked sexual dimorphism of Eclectus Parrot results in people believing that the two sexes do not belong to the same species.

In another question, participants were asked whether they had seen any of the birds listed. It was apparent that some participants who said that the species were known to them had never seen them either in the wild, in zoos, theme parks or on film (Table 2). The percentage who had not seen them but said that the species was known ranged from 1% to 47%, being least for Laughing Kookaburra (1%) and Australian Magpie (2%) and highest for Brolga (47%). The difference for threatened species ranged from 8% (Gouldian Finch) to 29% (Golden-shouldered Parrot).

In order to determine the extent of the participants' knowledge of birds, participants were asked to rank their knowledge of individual species as "very good", "good" or "poor". When participants said that a species was known, their knowledge of the species was often "poor", especially of threatened species. Although most participants knew about the existence of certain species, especially the more common species, their knowledge was rarely "very good", even for common species. Most participants said that their knowledge was "poor" (Table 3). Only a small percentage of those said that their knowledge was "good" for species that have a restricted range in northern Australia. The number of non- responses was highest for threatened species restricted in their range. Knowledge of common birds was most widespread but least for threatened species, i.e. those needing urgent conservation attention (Table 3).

Table 2. Responses to the question "Have you seen these birds?".

Species	Have you seen these birds?		
	Yes (%)	No (%)	No response (%)
Southern Cassowary	78	20.5	1.5
Brolga	33.5	66	0.5
Laughing Kookaburra	94.5	5	0.5
Australian Magpie	94	5.5	0.5
Red-tailed Black Cockatoo	70	29	1
Palm Cockatoo	24	70	6
Eclectus Parrot	18	76	6
Golden Bowerbird	32.5	64	3.5
Golden-shouldered Parrot	18	77	5
Gouldian Finch	36	60	4

Note: In this question "Have you seen these birds" was meant to include having seen them in the wild, in aviaries, zoos or on film. This was explained to the survey participants from survey II onwards.

Table 3. Initial knowledge of bird species in the survey.

Species	Knowledge of species			
	Very good (%)	Good (%)	Poor (%)	No response (%)
Southern Cassowary	8	41	51	0
Brolga	6	35	59	0.5
Laughing Kookaburra	22	51	26	1
Australian Magpie	21	49	30	0
Red-tailed Black Cockatoo	4	29	67	0
Palm Cockatoo	2	16	82	0
Eclectus Parrot	6	17	74	4
Golden Bowerbird	6	27	67	0
Golden-shouldered Parrot	6	17	74	4
Gouldian Finch	4	21	74	0

Table 4. Responses to the question "Are you in favour of their survival as species?".

Species	Are you in favour of their survival as species?			
	Yes (%)	No (%)	Indifferent (%)	No response (%)
Southern Cassowary	96.5	0.5	1.5	1.5
Brolga	96.5	0.0	2.5	1.0
Laughing Kookaburra	96.5	0.5	1.5	1.5
Australian Magpie	93.0	3.0	3.5	0.5
Red-tailed Black Cockatoo	97.5	0.0	0.5	2.0
Palm Cockatoo	95.0	0.0	1.0	4.0
Eclectus Parrot	94.0	0.5	2.0	3.5
Golden Bowerbird	96.0	0.0	1.0	3.0
Golden-shouldered Parrot	93.5	0.0	2.5	4.0
Gouldian Finch	93.5	0.5	2.5	3.5

In addition, we wanted to determine whether the participants were in favour of the survival of the selected species (Table 1). At least 93% of participants were in favour of the continuing existence of all the selected species (Table 4). For most species, less than 1% said they did not favour its survival, the exception being Australian Magpie, where 3% of participants said they did not favour its survival. This may have been because some magpies attack humans during the breeding season (Jones and Neelson 2003). A few participants said they were indifferent to the survival of each of the species. Most individuals favoured the continued survival of the listed bird species even when they did not have any knowledge of them. This suggests that existence values were quite strong in this sample of the public.

Discussion

The overall picture that emerged from the survey was that participants' knowledge of the existence of many Australian tropical bird species was poor. Furthermore, the depth of knowledge of respondents about many of these species was low, even when participants knew of their existence. This was also evident from data collected during the survey but not reported on in this paper.

Conservation implications

Several conservation implications arise from the public's poor knowledge of the existence and threat status of bird species. People are more likely to give greater economic and other support for species that are known to them. In other words, when public knowledge is poor, common species are likely to benefit more. The support for conservation of common species is likely to decrease with the increase in knowledge of the public of other species, especially knowledge of species that are threatened. On the other hand, those species that are less known or unknown to the public (although threatened) are likely to get less support than when the public is better informed. The questionnaire survey conducted provides evidence that in the absence of balanced knowledge, people are likely to give greater support to species that are better known to them than they would otherwise. However, once adequate information is provided on all species and their current status, people are willing to provide more support for threatened species (Table 5).

In survey I (prior to provision of extra information about all species) the participants were told to imagine that they have been given A\$1,000 (and that they could only donate it to organizations in Australia to help conserve bird species listed in Table 1), and asked what percentage of this money they would allocate to each species for its conservation. After extra (more balanced) information was provided about bird species (Table 5), a similar question was asked in survey II.

For the better-known and most common species, such as Australian Magpie and Laughing Kookaburra, participants on average allocated the least for their conservation in survey I (significantly less than 10%; Table 5). However, this was more than the amount participants allocated after they were provided with information about all species. For all other species (except the cassowary), the allocation in survey I was 10–11% or close to it. This may have been because when knowledge of those other species (e.g. Golden-shouldered Parrot, Golden Bowerbird) was poor, respondents had difficulty in making allocations and hence tended to treat all poorly known species equally. This would accord with Laplace's principle of "insufficient reason" (Laplace 1951).

Table 5. Average percentage allocation of A\$1,000 by the respondents.

Species	Survey I	Survey II	Average change between surveys I and II
Southern Cassowary	11.93	15.41	+3.48*
Brolga	9.41	10.65	+1.24**
Laughing Kookaburra	8.54	5.88	-2.66*
Australian Magpie	5.92	4.16	-1.76*
Red-tailed Black Cockatoo	11.73	6.70	-5.03*
Palm Cockatoo	10.06	7.66	-2.4*
Eclectus Parrot	10.79	9.07	-1.72*
Golden Bowerbird	10.61	8.46	-2.15*
Golden-shouldered Parrot	10.87	15.25	+4.38*
Gouldian Finch	10.13	16.77	+6.64*

Note: Theoretically the percentage allocations in survey I and survey II should each add up to 100 but due to rounding errors and shortcomings in some of these responses this does not occur exactly. Equal percentage allocation for all species is 10%.

*, **Statistical tests (ANOVA) conducted show that the changes in values placed by the participants between survey I and survey II are statistically significant at 0.02 and 0.05 levels respectively for a two-tailed test.

However in survey II, with better information about all species, respondents became more discriminating in their willingness to support conservation, and the variance of their allocations to the conservation of different species rose. In particular, allocations to those species reported to be threatened grew at the expense of common species and those not in imminent danger. Similar behaviour has been observed for conservation support of Australian mammals (Tisdell and Wilson unpublished).

Respondents' allocations of funds altered once balanced additional information on bird species was provided. Participants redistributed their allocations in favour of species needing more conservation attention. This supported the view that participants place high existence value on species. This suggests that it is important to highlight the plight of targeted species in order to achieve maximum results in raising funds for bird conservation. In the event that more than one threatened species is involved, the public are likely to provide greater financial support for species in most immediate danger of extinction. Financial support by the public for the conservation of threatened species is likely to be higher than for common species although the public favours the survival of all species.

Cassowaries, Golden-shouldered Parrots and Gouldian Finches (Table 1) are all Globally Threatened (Garnett and Crowley 2000) and these recorded the greatest percentage increase in the allocation of conservation funds. The results indicated that in survey II, allocations to threatened birds increased while support decreased for common species and for those not in any immediate danger of extinction. Interestingly, for threatened species, allocations were more than the average amount of 10% in survey I and this increased even further once it was revealed that they were threatened. The money allocated for Brolgas was lower than the average amount of 10% in survey I, but once it was revealed that the Brolga is listed as rare or uncommon (except in tropical Australia) the respondents were willing to allocate more money to this species. All threatened species received increased allocations in survey II. The allocations for Brolgas increased in survey II, to exceed the average amount of 10%, but the rise was the least (1.24%) of the positive changes for the listed species. Perhaps this was because the booklet provided to the participants stated that Brolgas are "uncommon or rare except in northern Australia". These results suggest that campaigns conducted to raise money for threatened species are likely to yield a higher level of donations than those conducted for species that are not threatened, assuming all other significant factors to be the same.

Conclusions

The main aim of this study was to determine whether poor public knowledge of Australia's threatened tropical bird species was likely to affect levels of support for their conservation. The results indicated how the lack of balanced knowledge of the status of bird species could result in more support for species that are common and well known than for those species that are less well known (and/or threatened). One of the main objectives of the study was to provide evidence for changes in public attitudes that arise from a better knowledge of species and their current status. Furthermore, the experimental survey revealed other interesting facts about the knowledge of Australian birds. Despite the large number and diversity of Australian bird species and subspecies (where many species and subspecies are endemic to Australia and are brightly hued) the average knowledge of birds of the participants was poor.

Despite all the bird species selected for the survey occurring in Queensland, public knowledge of most species confined to Queensland's tropical north was poor. Participants clearly knew more about common species present in or near Brisbane than those species restricted to tropical Australia. Some species that were unknown to the participants were threatened, highlighting the need for public education. Without better knowledge, some species could disappear without most of the public being aware of their extinction. Campaigns to highlight the status of threatened birds can win increased public support (financial and otherwise) for conservation of these species. Conservation organizations should target such species in their fund-raising campaigns to raise money for the protection and conservation of birds.

Nearly all participants favoured the existence of all the selected species despite their lack of knowledge of many individual species. The survey results indicated that programmes to educate the general public about the status of bird species should be an important component of conservation action plans for birds. Poor public knowledge may lead to a misallocation of limited resources for the conservation of birds, but this can be counteracted by providing balanced information about all species. Finally, although this study relates to a specific set of Australian bird species, the general results are likely to be of international relevance.

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