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HOW KNOWLEDGE AFFECTS PAYMENT TO CONSERVE AN ENDANGERED BIRD

Abstract

The paper reports the findings of an experimental survey conducted to determine the public's willingness to pay for the protection and conservation of the golden-shouldered parrot in Australia. This parrot is endemic to Australia and is one of Australia's most endangered birds. The paper examines the public's knowledge of this parrot and compares it with other endangered birds as well as common birds and the public's willingness to pay for conservation from a hypothetical allocation of money based on their current knowledge. We then examine how this allocation changes with increased knowledge about all species. Comparisons are made.

HOW KNOWLEDGE AFFECTS PAYMENT TO CONSERVE AN ENDANGERED BIRD

1. Introduction

The public's knowledge of birds and other wildlife is important because such knowledge has the potential to influence the public's support for conservation (Wilson and Tisdell, in press). This includes both monetary and non-monetary support. This is especially so for species that are endangered and not well known by the public. When knowledge of wildlife is low, the economic and other values the public place on them is likely to be lower than otherwise. On the other hand when the current status and threats of species are better known, it enables the public to make more balanced decisions giving more support to species that are more in need than those that are common or less threatened.

The aim of the paper is to examine how the public's knowledge affects their stated payment to conserve an endangered Australian bird, namely the golden-shouldered parrot. This parrot is one of Australia's most beautiful, but endangered and is restricted to a few localities in far north Queensland, Australia. There are several threats affecting this species and it is now estimated that the population of this bird is less than 2000 breeding birds in the wild (McNaughton, (2002). Although a recovery action plan has been in operation since the mid-1990s to protect and conserve this species, it is also important to obtain the support (monetary and otherwise) of the public for its conservation. However, this is largely dependent on the knowledge and experience the public have about the species. It turns out that this endangered parrot is poorly known because of its restricted range and low publicity given to it (it is not a flagship species). As a result, this lack of knowledge could seriously jeopardize the support the public could potentially give for its conservation. This issue is examined in detail from many angles, both before and after provision of balanced information and after giving the participants an opportunity to see this endangered bird.

Randall et al. (1974) have discussed the potential role information provision can have on value estimates using the CVM. Samples et al. (1986) have demonstrated that information disclosure (such as its current status, e.g. animal being endangered) has an impact on the participants' WTP allocations. Their work was conducted using separate sample groups. Our study is unique because we show how monetary allocations and support for an endangered

bird changes before and after information provision and after actually seeing the species. This issue is akin to the importance of information disclosure (Tkac, 1998).

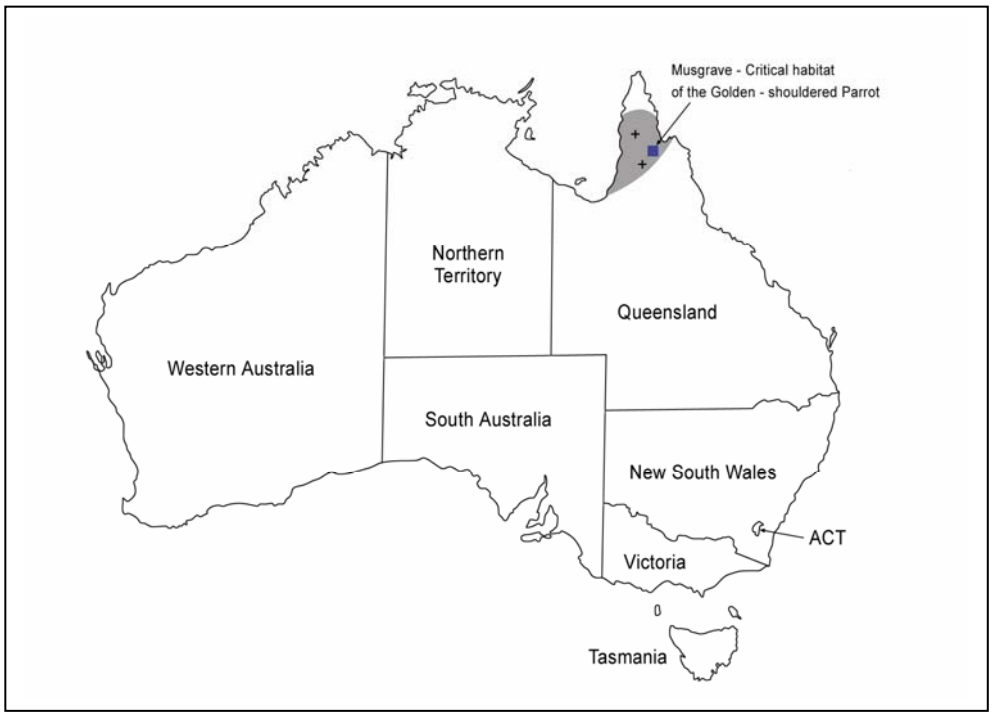
In this paper, the experimental survey results obtained from a sample of 204 residents of Brisbane, Queensland, Australia are used to examine the public's knowledge of this parrot and compare it with other selected bird species that are endangered, common and have a restricted habitat. The results are also used to show how lack of balanced knowledge could lead to this species getting less monetary support than others when really it ought to get more support because of its endangered status. This discrepancy is corrected when balanced information is made available to the public. In order to examine this issue further we single out the golden-shouldered parrot to determine the maximum amount the public are willing to pay for its protection and conservation for the next ten years before and after the provision of additional information. This is to demonstrate the importance of the public's knowledge of this parrot in determining the degree of their support. We also determine what percentage of this support depends on the personal chances of the respondent being able to see the species in the wild or benefiting personally and directly from their presence in the wild in Australia. In other words, we examine the degree of use and non-use values the public place on this bird in their decision-making process to support its conservation. Furthermore, we examine how the public's support changes for this parrot when multiple species are involved (we have selected a mammal and a reptile) while the budget constraint remains the same before and after the provision of adequate information on all of them. Finally, we show how the support among the participants changes after actually seeing this bird at a conservation park in a captive setting.

2. Status and Threats Facing the Golden-Shouldered Parrot

The golden-shouldered parrot, *Psephotus chrysopterygius*, is classified as endangered (Garnett and Crowley, 2000). According to McNaughton (2002), one estimate made in 1999 puts the population of this parrot at around 2000 breeding birds in the wild. It is endemic to Australia and is found only in a few localities in the Cape York Peninsula (Figure 1).

Figure 1:

Map showing the distribution of the Golden-shouldered Parrot



Note: + indicates incidental observations.
Source: Based on Barrett *et al.* (2003); Reader's Digest (1997a)

The shaded area shows the golden-shouldered parrot's likely present range and the box shows Musgrave, its stronghold and where the species was recorded during surveys conducted for the compilation of *The New Atlas of Australian Birds* (Barrett, et al. 2003, p.310). Some of the threats affecting this species include clearing of its grassy woodlands for cattle grazing and the farming practice of burning to produce green shoots for livestock (Garnett and Crowley, 2000). These practices have not only reduced the availability of food for these parrots, but also reduced the nesting sites because of the removal of termite mounds which are used as nests by burrowing into them and have increased "the success rate of the parrot's predators" such as pied butcherbirds (Garnett and Crowley, 2000).

While the rarity and elegance of this parrot have made it much sought after by collectors in the past, these same characteristics have, in recent times lead to an ecotourism venture in golden-shouldered parrot-based tours mainly utilising the Musgrave area (Figure 1). It is interesting to note how the use of this bird has changed from having a consumptive form of

economic use to a non-consumptive form of use. This issue is further dealt with later in the paper.

Due to its declining and threatened status a recovery plan has been put in place for its conservation by Environment Australia (Garnett and Crowley, 2000). The objective of the plan is to increase its numbers and down list the status of the species from 'endangered' to 'vulnerable' within 15 years. As a result of this plan, it is hoped to increase existing populations and help to re-occupy the former range, thus reversing the current contraction in its range and population.

3. Experimental Survey – Methodology

This experimental survey was conducted among Brisbane residents during the period July-September 2002 to determine the Brisbane public's knowledge of Australian wildlife, especially Australia's tropical species and the public's willingness to conserve them and the values they place on each species. The golden-shouldered parrot was selected as a species of special interest. The study then elicited the participants' perceived knowledge of the selected bird species and changes in their knowledge after provision of information.

Considerable publicity was given about the survey by means of letter dropouts and local community newspapers. A large section of Brisbane suburbs with varying socioeconomic backgrounds were covered. The main purpose of the experimental survey was not revealed to avoid bias. The wording used for this purpose 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**

The potential participants were told that the entire study would take approximately two hours. Two sessions were scheduled for a week day and another two on a Saturday at the University of Queensland and another session in a church hall on a Sunday. These arrangements were made to make the survey more attractive to a wide group of Brisbane residents. The participants were promised AUS$20 for their participation plus free parking or re-imbursement of any public transport costs. A free lecture was also included for the second stage of the survey (second hour) and the participants were promised that they would be eligible to enter a draw for a prize of AUS$200 if the survey forms were returned.

Obtaining the participation of 200 plus was the intended target and the responding participants were selected on a first come first served basis according to the age distribution of the city of Brisbane. This was done so that the participants would be representative of Brisbane residents. In all, 204 Brisbane residents took part and it was conducted dividing the participants into groups of about 40 persons for each session. Prior to this exercise the questionnaire was pre-tested among 20 undergraduates and their comments were sought. Adjustments were made. The selected Australian wildlife consisted of birds, which included the golden-shouldered parrot, mammals and reptiles and was placed in separate sections of the questionnaire. Ten species of Australian birds were selected as will be discussed later.

One of the reasons for selecting the golden-shouldered parrot was because the survey concentrated on studying the valuation of Australia's tropical wildlife. Another reason for its selection was because it is one of Australia's endangered species.

The survey was conducted in two stages. The first hour was used to gather background information and the current knowledge about Australian wildlife including birds such as the golden-shouldered parrot and the monetary values participants' placed on conservation of species. This was done using a structured questionnaire. Before the first survey commenced the participants were given clear instructions about filling out the survey form and the area of tropical Australia were shown.

Participants took approximately 45 minutes to 1 hour to complete Survey I. *A*fter the break the second stage of the survey was commenced. During this session, the participants were provided with Survey II which consisted of similar questions to the first survey, together with a few additional questions. The authors also provided a colourful brochure to the participants which contained information on each species on current status, geographical range, photographs and other relevant information. Approximately the same amount of factual background information was provided for each species except for two common birds found in most Brisbane gardens/suburbs (Australian magpie and laughing kookaburra). Information about the Australian magpie and the laughing kookaburra were not provided because they are common birds and it was assumed that participants would know them. Every effort was made to avoid normative statements. The material used in the brochure for each bird species was sourced from Morcombe (2000); Pizzey and Knight (1998) and Reader's Digest (1997a).

The participants were told to fill out the second questionnaire once they got back home and return the completed survey forms in the self addressed stamped envelope in two weeks time. For the next 45 minutes we invited Dr Steven Van Dyck, Curator of Mammals and Birds, Queensland Museum, to give a presentation on Australian wildlife. This was done placing emphasis on the mahogany glider *Petaurus gracilis* which he helped to re-discover in the late 1980s. Dr Van Dyck also gave an introduction to Australian birds and demonstrated the colourful birdlife in Australia by showing skins of the eclectus parrot, where the female is more brightly hued than the male. In short, in the second stage of the survey, participants were provided with adequate information (both print and to some extent oral) about the status, distribution, current threats and all other relevant information.

In Survey II, the participants of Surveys I and II were given the opportunity to visit David Fleay Willdife Park. This displays the golden-shouldered parrot and some of the bird species included in the survey. David Fleay is a conservation park for Australian endangered species especially those of tropical Australia with a focus on Queensland species. The participants were offered a free entrance ticket to visit this park together with a half priced ticket as an added incentive to encourage the participants to make a visit. The participants were given a third survey form with instructions to fill it out only after the visit to the park and return it within two weeks of the visit. Of the 204 participants, 119 took the opportunity to visit the park and respond to the third evaluation survey form. The main objective of this survey was to examine how the participants' support for the selected species would alter after their visit to the park. Six out of the ten bird species selected for the study are displayed at this conservation park.

4. Survey Results

The survey revealed interesting facts about the participants' knowledge and values they place on the golden-shouldered parrot and other species that are both common and uncommon and birds that have a restricted distribution in tropical Australia. The survey revealed that the golden-shouldered parrot was one of the least-known bird species (Table 1). Rare species and those with a restricted habitat were also less known. On the other hand it was revealed that birds, such as the Australian magpie and the laughing kookaburra, which are common birds, were well known to the participants. The Australian magpies and the laughing kookaburras are common birds in Brisbane gardens, whereas the golden-shouldered parrot has a very restricted distribution.

Table 1:

Responses to the question whether the Golden-shouldered Parrot and other species were known to the participants in Survey I

Species	Species known		
	Yes (%)	No (%)	No Response (%)
Common			
Laughing Kookaburra	96	03	01
Australian Magpie	96	03	01
Red-tailed Black Cockatoo	80.5	19	0.5
Common in restricted range			
Palm Cockatoo	30.5	68	1.5
Eclectus Parrot	22.5	75	2.5
Brolga	80	19	01
Golden Bowerbird	47.1	51	2.0
Endangered			
Golden-shouldered Parrot	27	71	2.0
Southern Cassowary	87	12	01
Gouldian Finch	44	55	01

Source: Based on Simpson, Day and Trusler (2003); Morcombe (2000); Pizzey and Knight (1998); Reader's Digest (1997a). Number of participants: 204

As can be seen (Table 1), only 27% of the participants knew about the existence of the golden-shouldered parrot, which is the second least known bird after the eclectus parrot (22.5%). Interestingly, the number (2%) of 'no responses' was the second highest for the golden-shouldered parrot. The number who did not answer the question on whether the species was known to them was highest for the eclectus parrot (2.5%) followed by the golden-shouldered parrot and the golden bowerbird (2%). Of those participants who said that the species is known to them, 69% were born in Australia and the rest (31%) were born outside Australia. Furthermore, of those who knew of the existence of the golden-shouldered parrot, 39% had lived or worked in tropical Australia and 78% had travelled in tropical Australia. It can be seen from Table 1 that the common birds and those that have a wider distribution were better known than those that were endangered and those that had a restricted distribution (although common) except for the southern cassowary and the brolga. This is probably because these two birds are large and have received considerable publicity in recent times and are exhibited in most conservation parks, zoos and theme parks in Queensland and

other parts of Australia. Furthermore, these two birds are also the subject of several Australian children's stories and paintings.

In another question, participants were asked whether they had seen the golden-shouldered parrot. This includes birds seen in the wild, aviaries, conservation parks/zoos, films/TV documentaries and books. The results reveal that the golden-shouldered parrot and the eclectus parrot were the least seen of the listed birds. As shown in Table 2, only 17.5% of the participants had seen the bird.

Table 2:

Responses to the question "have you seen these birds?"

Species	Have you seen these birds		
	Yes (%)	No (%)	No Response (%)
Laughing Kookaburra	94.5	05	0.5
Australian Magpie	94	5.5	0.5
Southern Cassowary	78	20.5	1.5
Red-tailed Black Cockatoo	70	29	01
Gouldian Finch	36	60	04
Brolga	33.5	66	0.5
Golden Bowerbird	32.5	64	3.5
Palm Cockatoo	24	70	06
Eclectus Parrot	18	76	06
Golden-shouldered Parrot	18	77	05

Note: The percentages have been rounded to the nearest decimal point. Number of participants: 204

The results are to be expected because this bird is endangered in the wild with a low and declining population as discussed in Section 2. Although it is a rather common exhibit in conservation parks, zoos and theme parks in Queensland it could easily be overlooked. Table 2 also reveals that a large majority of the participants had seen the common birds. In most respects, the results are similar to those revealed in Table 1.

In addition to the above two questions, we wanted to determine the extent of the participants' knowledge of the golden-shouldered parrot and compare it with that of other birds selected for the survey. For this purpose, the participants were asked to rank their knowledge of individual species as *very good*, *good* or *poor*. Of those who said that they knew about the existence of the golden-shouldered parrot, the majority said that their knowledge was *poor*. Only 6% said that their knowledge was *very good* and 17% said that their knowledge was

good. There was no response from 4% of the participants. A similar pattern is evident for other endangered species or those with a limited geographical distribution. The extent of knowledge of species is highest for those species that are common. The percentage of participants saying that their knowledge is poor is among the highest for the golden-shouldered parrot (74%).

In order to further determine the extent of the knowledge of the golden-shouldered parrot, we asked whether this parrot was present in northern Australia. Other species were also included in the question so that the results could be compared.

Once again, the poor state of knowledge about the golden-shouldered parrot was demonstrated. In fact, only 50% of the participants said they are present in northern Australia. This percentage was the third lowest when compared with other species. However, none of the participants said they are not present in northern Australia. The percentage of those saying they were unsure was also high. Like in other questions the participants knew more about common species than the less known species.

In order to further verify the participants' knowledge of the golden-shouldered parrot, the participants were asked whether it, along with other birds were found outside Australia. Approximately 11% of the participants thought that the golden-shouldered parrot is found outside Australia. On the other hand 41% said that these birds did not occur outside Australia while the percentage of those who were unsure was higher.

The overall picture that emerges from the questions is that the participants' knowledge of the existence and experience of the golden-shouldered parrot is poor. When compared with similar species that are endangered and have a restricted range, the results show that the participants' awareness and depth of knowledge of this species is one of the lowest. From the survey results it can be inferred that this endangered parrot is undoubtedly one of the least-known birds in Australia. Interestingly, Spash and Hanley (1995) have shown the prevalence of a high degree of ignorance when it come to participants' understanding the concept of biodiversity.

Next, we wanted to determine whether the participants were in favour of the survival of the golden-shouldered parrot and the selected species shown in Table 1. Although a large number of the participants were unaware of the existence of the golden-shouldered parrot, more than

93% of the participants were in favour of its continuing existence. Interestingly, none said 'no' to its existence while 2.5% said they were indifferent and there was no response from 4% of the participants. In terms of the percentage of participants saying 'yes' to the survival of the bird species in the focus set, the golden-shouldered parrot ranked second last. However, the difference between the first and the last ranking is small. One of the reasons for receiving the low ranking for the golden-shouldered parrot and the gouldian finch could be the low level of the knowledge the participants had about these. However, the same reason for the low ranking of the Australian magpie cannot be given for this species. Most likely magpies had a low ranking because some magpies attack humans during the breeding season (Jones and Nealson, 2003).

A. Willingness to pay for the protection and conservation of the Golden-shouldered Parrot before and after the provision of information

The above analysis demonstrates the participants' lack of knowledge about the golden-shouldered parrot, other endangered birds, and those birds with a restricted distribution. Hence, it is clear that provision of adequate information is an important factor for the public in making decisions on how much money to allocate for species for their protection and conservation. In fact, in contingent valuation (CV) studies provision of adequate information to the participants plays a crucial role in obtaining unbiased (valid) responses. For instance, Mitchell and Carson (1989) show the need for participants to be presented with adequate information when conducting CV studies. They state 'A detailed description of the good(s) being valued and the hypothetical circumstance under which it is made' should be made available to the respondent (1989, p. 3).

In order to examine how information and knowledge about species play a role in decision-making, we asked the participants how much they would donate from a hypothetical sum of money for the golden-shouldered parrot and other bird species in the survey. This was determined first on the basis of their initial knowledge and, then after provision of more information. For this purpose, we asked the following question before and after the provision of information:

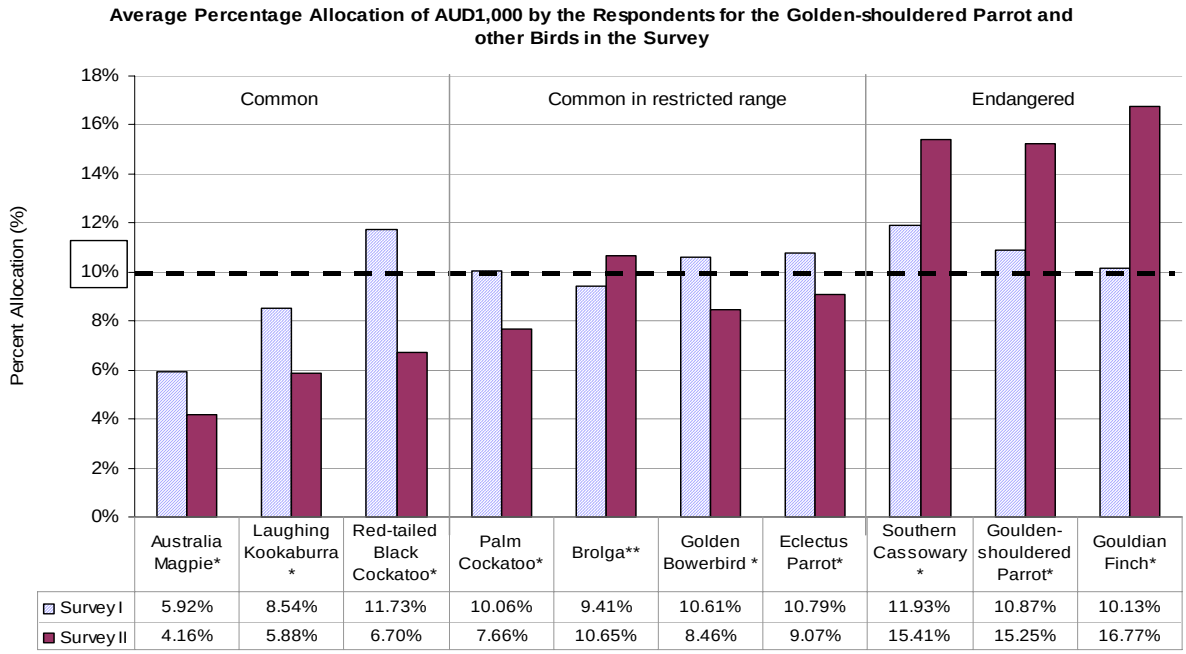
Once again suppose that you are given AUS$1,000, but this time to help conserve birds in Australia. You can only use it for the purpose of donating to organizations committed to

conserving the bird species listed below. What percentage of it would you allocate for the conservation of each of the birds listed? Your total should add up to 100%.

In Survey I (prior to provision of extra information about all species) the participants were told that supposing they were given AUS$1,000 (and that they could only donate it to organisations in Australia to help conserve bird species listed in Table 1), what percentage of this money they would allocate to each species for its conservation. The participants were told that the money allocated should add up to 100%. After extra (more balanced) information was provided about bird species listed in Table 1, a similar question was asked in Survey II.

The results clearly demonstrate that the availability of information of a balanced nature does have an impact on the amounts allocated for the golden-shouldered parrot. The results show the need for the public to be aware of its existence and its current status. This could have several policy implications.

Figure 2



	Australia Magpie*	Laughing Kookaburra *	Red-tailed Black Cockatoo*	Palm Cockatoo*	Brolga**	Golden Bowerbird *	Eclectus Parrot*	Southern Cassowary *	Goulden-shouldered Parrot*	Gouldian Finch*
Survey I	5.92%	8.54%	11.73%	10.06%	9.41%	10.61%	10.79%	11.93%	10.87%	10.13%
Survey II	4.16%	5.88%	6.70%	7.66%	10.65%	8.46%	9.07%	15.41%	15.25%	16.77%

Notes:
* Differences in value between Survey I and Survey II are statistically significant at the 1% level in one-tailed tests.
** Difference in value between Survey I and Survey II is statistically significant at the 5% level in a one-tailed test.

As can be seen from Figure 2 the percentage allocation for the golden-shouldered parrot increases considerably after the provision of information while for common species the

percentage allocations decrease quite markedly. The golden-shouldered parrot fares much better than other endangered species such as the gouldian finch. In the absence of balanced knowledge of all species, individuals are likely to give relatively greater support for species that are well known to them. Support for these species has declined as more balanced information became available. In other words, when knowledge of the public is poor, common species are likely to benefit more. In such a situation species such as the golden-shouldered parrot are affected in terms of money allocated for conservation. This can be considered an economic failure in its own right. The results above are consistent with the findings of Tkac (1998) who show that willingness to pay values are directly related to the availability of information. Figure 2 indicates that the support for the conservation of common species is likely to decrease with the increase in knowledge of the public of endangered species such as the golden-shouldered parrot. In the absence of knowledge, species that are less known or unknown to the public (although rare and endangered) are likely to get less support than when the public know about the current status and threats. This has been demonstrated by Wilson and Tisdell (In Press). The golden-shouldered parrot is a good example. The above results are consistent with Samples et al (1986) study where they show that the 'effects of information disclosure may be especially acute' when endangered species are involved.

There is a further argument. As shown in Figure 2 although after the provision of balanced information, species that are less known and endangered get more support, some species in this category get less support than some others. For example, the golden-shouldered parrot gets less support than the gouldian finch. One of the reasons for this could be that the gouldian finch is a much better known bird than the golden-shouldered parrot and once the public are told that it is endangered in the wild the public are willing to allocate more for this species than for the golden-shouldered parrot that is less known. The gouldian finch is also more brightly coloured than the golden-shouldered parrot and is used more widely in aviaries. There is support for this argument in the literature. Gunnthorsdottir (2001, p. 211) states " it adds to a small but growing body of evidence that citizens' support for a specific conservation policy tends to be based on superficial characteristics of an animal rather than its ecological value and taxonomic uniqueness. I found that, in addition to size and similarity to humans, perceived attractiveness of an animal matters in a person's decision to support its conservation. Further, perceived attractiveness of an unattractive animal can be slightly increased if the animal is presented as endangered".

The results demonstrate that people make decisions according to knowledge available to them. However, once adequate information is provided, people are willing to provide more support for the vulnerable species such as this parrot. This result supports the view that participants place high existence values on species such as the golden-shouldered parrot. This is because on average participants escalate their support for species that are endangered by increasing their allocations for these species and reducing their allocations to less threatened species. There is evidence for this in the psychology literature. DeKay and McClelland (1996) show that allocations would be greater for endangered species that could be saved. This finding is also supported by Samples et al. (1986). Financial support of the public for the conservation of the golden-shouldered parrot is likely to be higher than for common species although the public favours the survival of all species.

In addition to using the above valuation approach we singled out the golden-shouldered parrot to determine the maximum amount the public in this sample are willing to pay for its protection and conservation for the next ten years before an after the provision of additional information about the species. This question was asked soon after a similar question was asked which singled out the tree-kangaroos as a mammal species for protection and conservation during the next 10 years. Hence, there is reference to tree-kangaroos in this question. The following question was asked before and after the provision of information to determine how information can influence how much the public are willing to pay for the protection and conservation of this parrot.

Now assume that there is a campaign to raise money to protect the golden-shouldered parrot in Australia instead of the tree kangaroos. In which case would you be willing to have your take-home income or income from elsewhere reduced by 2 dollars a week, that is $100 per year, for the next ten years to support research, protect and conserve the golden-shouldered parrots that occur in parts of Cape York peninsula in Australia?

The participants were given the option of saying they were willing to pay 2 dollars a week, more than 2 dollars a week or less than 2 dollars a week. The option was given to the participant as shown below.

Yes ❑ Would like to pay more ❑ Would like to pay less ❑

The purpose of this question was to determine how much the participants would be willing to pay before and after the provision of information. The results are shown in Table 3.

Table 3:

Monetary support for the Golden-shouldered Parrot with and without information

	Before Provision of Information	After Provision of Information
	%	%
Yes	40	45
Would like to pay more	03	02
Would like to pay less	51	46
No response	06	07
Total	**100**	**100**

Note: The percentages have been rounded to the nearest decimal point.
A zero answer was also possible. There were 10 zeros each in both surveys.

As the results show provision of balanced information does have an impact on how much people are willing to pay. Before the provision of information 40% of the participants said that that they were willing to pay $2 for the protection and conservation of the golden-shouldered parrot. This support increased to 45% after the provision of information. Those who are willing to pay less decreased, which means that they are willing to pay more after additional information is provided.

Furthermore, we asked the participants who said they would like to pay less than $2 or more than two dollars what exact amount they would want to pay in the form of an open ended question. The question was framed as follows:

If you are willing to pay more (or less) then what is the amount you would like to pay a week to conduct, protect and conserve the golden-shouldered parrots that occur in small parts of the rainforests of Cape York peninsula in Australia?

AUS$ ……. A week

Only those who said they would want to pay less than $2 or more than $2 answered this question.

The results show that the average for those who are willing to pay less before the provision information was $0.71 which decreases to $0.60 after additional information is provided while the average for those who are willing to pay more than $2 before provision of information is $4.92. The amount increases to $8.85 in the second survey. However, the numbers involved are marginal.

B. What does it all amount to?

In the survey, we also wanted to determine how much importance participants placed on use and non-use values when it comes to paying for the protection and conservation of the golden-shouldered parrot. For this purpose the following question was asked:

What percentage of this payment (roughly) depends on your personal chances of being able to see the golden-shouldered parrots in the wild (not in zoos or similar environments) or of you benefiting personally and directly from their presence in the wild in Australia?

❑ 1-20 ❑ 21-40 ❑ 41-60 ❑ 61-80 ❑ 81-100

From this question we wanted to determine how the use- and non-use values participants place on species would change before and after the provision of balanced information. A percentage between 1-20 indicates that the importance placed on use-values (being able to see) in the wild is low. On the other hand a percentage between 81-100 would mean that the importance placed on use-values is high. The results are reported in Table 4.

Table 4

Responses to the question "what percentage of this payment (roughly) depends on your personal chances of being able to see the Golden-shouldered Parrots in the wild?"

	Before Provision of Information	After Provision of Information
	(%)	**(%)**
0	0.5	1.5
1-20	55.6	57.8
21-40	8.8	12.3
41-60	7.8	7.4
61-80	6.8	4.9
81-100	4.9	1.0
No response	15.6	15.2
Total	**100**	**100**

Note: The percentages have been rounded to the nearest decimal point.

The results are interesting. As can be seen from Table 4 the importance the majority of the participants placed on seeing the golden-shouldered parrot in the wild in order to be willing to pay for its protection and conservation is low. Only a small percentage of participants said that their payment to a large extent depended on their personal chances of being able to see the golden-shouldered parrot. This was before the provision of additional information. After the provision of additional information the percentage of participants saying that their payment was mainly dependent on personally seeing the parrot decreases while the payment not being linked to personally seeing the parrot increases. Although a 0% of sightings were not included as a possibility, some participants indicated that their payment was not based on being able to see the parrot. The results indicate that the majority of the participants' willingness to pay for its protection and conservation are mainly based on non-use values and not on use values. This result has been confirmed by other studies (Bandara and Tisdell, 2003; Tisdell and Wilson, 2004).

In addition, we wanted to find out why participants chose responses summarised in Table 4. We asked the following question for this purpose:

Briefly indicate your reason for your chosen percentage

Those who answered this question cited various reasons which could be classified under 'use values and non-use values'. For example, some of the comments that could be classified under 'use values' were: *Appreciate bird-watching, I like to see them in the wild, prospect of sighting them increases commitment.* The comments that could be classified under 'non-use' values were: *They should be preserved, don't mind if I don't see it – knowing it survives is enough, I just need to know they are well*. There were several comments that would not fall into either category. These comments were put into a separate category called 'other'. They are shown in Table 5.

Table 5:

Reasons cited by participants for chosen percentages

	Before Provision of Information	**After Provision of Information**
	%	**%**
Non- use values	35	57
Use values	07	08
Other	12	20
No response	46	15
Total	**100**	**100**

Note: The percentages have been rounded to the nearest decimal point.

Clearly the majority of the participants' willingness to pay for the protection and conservation of the golden-shouldered parrot was based on non-use values rather than use values. The results are consistent with the findings of Fredman (1995) who provide evidence for a high degree of 'existence values' among the public in Sweden. Table 5 confirms that the participants willingness to pay for the golden-shouldered parrot's protection and conservation is not based on their personal chances of seeing the bird, but rather on non-use values such as existence, bequest and option values. This shows that use values alone does not represent economic value or worth as explained by Bishop (1987). As can be seen the percentage of reasons cited by the participants which were related to direct use was only 7% in Survey I and this increased marginally to 8% in Survey II. On the other hand, the reasons cited that could be related to non-use values were 35% (Survey I) which increased to 57% in Survey II. The percentage of responses that did not fall into either category was 12% in Survey I which increased to 20% in Survey II. Table 4 and 5 show that the participants' payments are largely based on non-use values and not on use values such as being able to see

these parrots in the wild. In other words, the economic non-use values people place on the Golden-shouldered Parrot are high.

Furthermore, we wanted to determine how the donations made for the protection of the golden-shouldered parrot would alter when donations for several species are involved. For this purpose, in addition to the golden-shouldered parrot we included a mammal (Tree-kangaroo) and a reptile (Hawksbill sea turtle) species. Once again, the same question was posed before and after the provision of information. The question was framed as follows:

*The above questions were asked to determine how much you or your family would be willing to pay for the conservation of **only one species** of wildlife that occurs in **northern Australia.** Now assume that there is a campaign to raise money for all **three species** mentioned above (Tree kangaroos, gs and Hawksbill sea turtles) at the same time. In this case what is the **maximum** amount you would be willing to pay for **each** of the species? (**Please bear in mind that this is only one of many issues which may cost you money and that this may have to come from your/family budget**).*

The main purpose of this exercise was to determine how the values placed on the golden-shouldered parrot would change when a mammal and a reptile species are included. Although hawksbill is listed as endangered and the tree-kangaroos are found only in a restricted area, the species that is in need of most support is the golden-shouldered parrot in terms of numbers and distribution (Reader's Digest, 1997b). Furthermore, the hawksbill sea turtle is not endemic to Australia while the lumholtz tree-kangaroo is. Both these species have a larger population and geographical distribution than the golden-shouldered parrot. The results of this question are reported in Table 6.

Table 6:

Willingness to Pay for three Australian tropical species before and after provision of information

Amount	Before Provision of Information			After Provision of Information		
	GHP	**TK**	**HST**	**GHP**	**TK**	**HST**
	%	%	%	%	%	%
0-1.99	65	61	59	64	63	62
2-3.99	19	21	24	21	23	23
4 and above	3	3	4	4	4	5
No response	13	15	13	11	10	10
Total	**100**	**100**	**100**	**100**	**100**	**100**
Average	1.40	1.73	1.57	1.45	1.43	1.36

Note: The percentages have been rounded to the nearest decimal point.

Table 6 shows that in Survey I the golden-shouldered parrot (GHP) gets the least average monetary support while tree-kangaroos (TK) get the most support which is $1.73 on average. This is not surprising because in Survey I, the golden-shouldered parrot was known only to 27 % of the participants while the Tree-kangaroo and the hawksbill turtle (HST) were known to 74% and 41% of the participants respectively. In Survey II after the provision of additional information, the support for the golden-shouldered parrot increases, though marginally, while the support for the tree-kangaroo fell from an average of $1.73 to $1.57 and for the hawksbill turtle from $1.43 and $1.36. This result is consistent with the public being willing to allocate a larger amount to those species that are most in need, irrespective of whether the species is a mammal, bird or a reptile.

In addition to the experimental survey the participants were given the opportunity to visit the David Fleay Wildlife Park to see the golden-shouldered parrot. Of the 204 participants, 119 took this opportunity to visit the park. Of the participants who visited the park, 63.9% of the participants were able to see this parrot. From this section of the study (Survey III) we wanted to determine whether the participants'willingness to support this bird had increased, decreased or remained the same after the visit. For this purpose we asked the following question:

As a result of your <u>visit to Fleay's</u>, *has your willingness to support financially or otherwise, the conservation of the following birds* ***(1) increased, (2) decreased or (3) remained unchanged****. Please place appropriate number in the column after each bird, and comment if you wish.*

The results enable us to examine whether the support for the golden-shouldered parrot increases, decreases or remains the same after actually seeing this endangered parrot. It also enables us to make a comparison between various species. For the analysis we have considered only those participants who saw the selected species listed in Table 7.

Table 7:
Willingness to support selected species after visiting
David Fleay Conservation Park

	Increased	Decreased	Remained Unchanged	No Response
	%	%	%	%
Golden-shouldered Parrot	33	00	58	06
Gouldian Finch	32	00	61	05
Eclectus Parrot	26	00	64	08
Southern Cassowary	25	02	69	04
Red-tailed Black Cockatoo	23	00	70	05
Brolga	21	00	70	06

Note: The percentages have been rounded to the nearest decimal point.

The results show that the frequency of participants saying that their support increased for species after seeing them was greatest for the golden-shouldered parrot. This is significant given that this species is one of the least known species in Survey I. Most of the participants said that their support 'remained unchanged' while the support did not decrease for the parrot and most other species. The support decreased only for the cassowaries by 2%, which is marginal. The number of 'no' responses is also low.

Furthermore, we examined whether the participants were prepared to support (financially or otherwise) the continued existence of the selected bird species from those who visited the conservation park. The responses of all the participants who visited David Fleay Conservation Park were analysed for this purpose. The results are shown in Table 8.

Table 8:

Willingness to pay for continued existence of the selected bird species from those who visited the David Fleay Conservation Park

	Yes	No	No response
	%	%	%
Gouldian Finch	86	8	7
Golden-shouldered Parrot	84	8	8
Eclectus Parrot	84	8	8
Golden Bowerbird	83	8	8
Southern Cassowary	82	8	9
Red-tailed Black Cockatoo	82	8	9
Brolga	76	15	8
Palm Cockatoo	81	8	11
Australian Magpie	66	24	10
Kookaburra	73	18	9

Note: The percentages have been rounded to the nearest decimal point.

Table 8 shows that participants are willing to give the golden-shouldered parrot (84%) is the second highest support after the gouldian finch (86%). However, the support for most of the species for their continued existence is very high. However, the support for the Australian magpie is low compared to the rest. The endangered species get a larger percentage of support.

In addition, we wanted to find out whether the participants' support towards wildlife changed after the whole survey program (Survey I, II, and III). For this purpose we asked the question:

As a result of this whole survey program, has your support (1) increased, (2) decreased or (3) remained constant? [For conservation of the selected species for the study]

For this question, too, we took into account the responses of all the participants who visited David Fleay Conservation Park. The results are shown in Table 9.

Table 9:

Responses to the question "as a result of this whole survey program, has your support (1) increased, (2) decreased or (3) remained constant?" [For conservation of the following species]

	Increased	Decreased	Remained Unchanged	No response
	%	%	%	%
Golden-shouldered Parrot	36	0	59	5
Gouldian Finch	36	0	59	5
Eclectus Parrot	34	0	61	5
Southern Cassowary	32	0	63	5
Golden Bowerbird	31	0	63	6
Palm Cockatoo	26	0	67	7
Brolga	26	1	68	5
Red-tailed Black Cockatoo	25	0	70	5
Kookaburra	16	3	76	5
Australian Magpie	11	3	80	6

Note: The percentages have been rounded to the nearest decimal point

Table 9 shows that 36% of participants increased their support for the golden-shouldered parrot, one of the highest increases. The support for the gouldian finch also increased by 36%. Support for the common species, Australian magpie and the kookaburra, decreased by 3% respectively. Approximately 59% of the participants said that their support did not change their support for the golden-shouldered parrot after the three surveys. This is the least change when compared with other species in Table 9. The results are interesting because the whole survey has helped to increase the support for this species from being one of the least known and least supported birds to one of the bird species that gets one the largest increases in support after the survey program (three surveys). It indicates that knowledge and experience play a crucial role in allocating support between species.

5. Conclusions

The main rationale for this particular study was to determine whether poor public knowledge of the golden-shouldered parrot, which is an endangered species, was likely to result in less economic and other support for its conservation. A comparison was made with common and better known bird species, together with some other endangered species. The results support this hypothesis. Furthermore, the experimental survey revealed other interesting facts about

the public's knowledge about the golden-shouldered parrot. It was found that a large number of the participants were unaware of its existence. In fact it was the second least known bird after the eclectus parrot. Of those who knew about its existence, the knowledge of the majority was poor.

The poor knowledge of the golden-shouldered parrot highlights the need for public education about this species and others that are endangered. Otherwise, this species could disappear without most of the public being aware of it prior to its extinction. On the other, hand a campaign to highlight the status of this bird can win increased public support (financial and otherwise) for its protection and conservation. Increased public support can help the recovery plan that has been undertaken since the mid 1990s to save this parrot from extinction.

A large majority (93.5%) of the participants favoured the existence of the golden-shouldered parrot. This was the case for all other species surveyed in the study. This was despite the public's poor knowledge of the golden-shouldered parrot and many other species. This is an encouraging sign. When the golden-shouldered parrot is singled out for financial support, the public's willingness to pay for its conservation increases after provision of information. Furthermore, even when the golden-shouldered parrot is included with mammal species (Tree-kangaroo) and a reptile species (Hawksbill turtle) to raise money for their conservation, the golden-shouldered parrot gets the largest allocation after the provision of information. Provision of information does influence the support provided (Samples et al., 1986). It is also interesting to note that most of the monetary allocations made for this species is based on non-use values. The percentage of non-use allocations increases substantially after the provision of information, including information on its current status. Furthermore, the support for this parrot increased significantly after participants actually saw it at David Fleay Conservation Park. In fact the whole survey helped to increase the support for conservation of this species. It went from being one of the least known and least supported birds to one of the bird species that gets one of the largest increases in support after the survey program (three surveys).

Another important finding is that the response rates for most questions increased for this species in Survey II and the number of participants saying 'no' to some of the questions relating to willingness to pay decreased after provision of information. Hence, the whole survey demonstrates that poor knowledge of the public about the golden-shouldered parrot

limits considerably public support for conservation of this parrot. Poor public knowledge of this species leads to a misallocation of resources which can be considered an economic failure. Furthermore, lack of balanced information has implications for the 'acceptability of the contingent valuation method in valuing biodiversity protection' (Spash and Hanley, 1995, p. 204). However, the good news is that it is counteracted when balanced information is provided about this species and all other species is made available. Information disclosure is important (Tkac, 1998). Finally, the results indicate that the education of the public about the status of the golden-shouldered parrot and other endangered birds can facilitate the task of conserving these birds.

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