

Short Communication

Exploring attitudes and understanding of global conservation practice among birders and avitourists for enhanced conservation of birds

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Summary

Birders are generally nature-oriented; however, their understanding of key bird conservation issues remains under-examined. We surveyed English-speaking birders online and face-to-face, asking questions related to their views on conservation, conservation funding and their understanding of a global bird conservation programme (BirdLife International's Important Bird and Biodiversity Areas [IBAs]). Most birders who responded to the survey were from Australia, the United Kingdom, South Africa and the USA. Birders tend to value bird conservation in an ecocentric way, often citing the overarching importance of general biodiversity. The ecological roles that birds play were also highlighted, but this varied across socio-demographic groups. Despite their positive support for conservation, less than half of all birders surveyed were familiar with the IBA programme. Familiarity with IBAs was driven by socio-demographic factors, with males more familiar than females and South African birders more familiar than birders from Australia and the United Kingdom. Most birders are willing to make contributions to bird conservation when visiting key birding sites, however they also feel governments should remain the main funders of conservation. Opportunities to enhance engagement between birders and bird conservation groups exist with most indicating a desire to learn more about bird conservation at birding sites. Increasing access to relevant information and presenting opportunities to contribute to conservation at birding sites could provide tangible benefits for bird habitats, protected areas and bird conservation groups.

Introduction

Engaging the general public in nature conservation will be key to ensuring successful mitigation of further biodiversity declines (McKay 2007, Novacek 2008, Papworth *et al.* 2015). Support may be expressed as recreational use and visitation of public protected areas providing revenue for conservation (Buckley *et al.* 2012, Morrison *et al.* 2012, Steven *et al.* 2013, Balmford *et al.* 2015) but also through independent conservation action (e.g. private reserves) (Lamers *et al.* 2014, Pegas and Castley 2014). Birding is one of the most popular nature-based recreational activities in the Western world, especially in the United Kingdom (UK) and the United States of America (USA) (Moss 2005, Connell 2009, Steven *et al.* 2014). However, there is also growing interest from China and South Korea (Lee *et al.* 2010, Li *et al.* 2013, Chen and Chen 2015), South Africa (Biggs *et al.* 2011, Simango 2011) and India (Urfi 2012, Seshadri *et al.* 2013). There are few, if any, taxonomic groups in which people invest as much recreational time and energy, as birds.

Conceptually, birders subscribe to a general conservation ethos and the environmental movement, but there is limited evidence supporting this. The level of environmental concern and tangible

conservation benefit among North American birders is as variable as the population of birders themselves (Glowinski and Moore 2014, McFarlane and Boxall 1996). Correspondingly, there are some activities specific to birding and avitourism that can represent a threat to birds (e.g. using call playback, using flash photography or deliberately flushing birds to photograph them) (Şekerçioğlu 2002, Green and Jones 2010, Biggs 2013). However, the relative threat that these activities pose are probably minimal compared to other human induced impacts such as habitat loss and introduced species (Steven and Castley 2013, Butchart *et al.* 2006).

Previous research has explored the potential links between birding and conservation (Hvenegaard and Dearden 1998a, b, Hvenegaard 2002, Isaacs and Chi 2005, Green and Jones 2010, Biggs *et al.* 2011, Cooper *et al.* 2015), however, further examination of this relationship is warranted (Steven *et al.* 2014). Our study extends previous research, presenting new findings related to birders and their stance on several conservation-related issues. Specifically, we address questions pertaining to: 1) birders' position on bird conservation, 2) birders' willingness to learn about bird conservation, 3) birders' feelings about conservation funding and 4) their knowledge of bird conservation initiatives. We examine birder awareness of conservation initiatives by asking about their familiarity with a global programme implemented specifically to conserve birds, the BirdLife International Important Bird Area network (IBA) (now known as Important Bird and Biodiversity Areas). The IBA network was first implemented in Europe in the early 1980s (Osieck and Morzer Bruyns 1981). Since then, it has grown to comprise more than 12,000 sites across 200 countries and territories (BirdLife International 2015). Our findings can inform bird conservation groups and practitioners where there are gaps in birders' understanding of conservation issues. Addressing these gaps can lead to more targeted efforts in community engagement, fundraising and increasing membership subscriptions among bird enthusiasts.

Methods

To maximise representativeness of the sample, we collected data via two survey instruments (questionnaires) presented to birders both in person and online (Miller *et al.* 2014, Guimarães *et al.* 2015). The questionnaire delivered online was longer than that presented face-to-face. Both online and face-to-face surveys asked birders about their familiarity with IBAs. Questionnaire design and interpretability was tested by reviewers of different disciplines (social scientists, geographers, ornithologists, tourism researchers etc.) prior to distribution. We obtained research ethics approvals prior to any survey instruments being used (Griffith University Human Research Ethics Committee: ENV_01_13_HREC; ENV_59_12_HREC).

The face-to-face questionnaire was delivered during 2013–2014 at various birding locations across Australia:

- 1) Lamington National Park (Scenic Rim IBA) - May 2013–November 2013
- 2) Wet Tropics World Heritage Area (Daintree, Atherton Tablelands, Wooroonooran and Coastal Wet Tropics IBAs) - October 2013
- 3) Fogg Dam Conservation Reserve (Adelaide and Mary River Floodplains IBA) Kakadu National Park (Kakadu Savanna IBA) - September 2014

Data were also collected at the British Bird Fair at Rutland Water Reserve (Rutland Water IBA) in the United Kingdom (August 2013). We selected these sites as they are known to have high levels of birding activity.

We used purposive sampling methods and intercepted respondents at field sites in Australia using cues to determine whether or not they were participating in birding (Hvenegaard 2002), including being in possession of either a pair of binoculars or a camera appropriate for bird photography (i.e. SLR with zoom lens). We gained confirmation of their motives after they indicated they were interested in birding when engaged in a casual greeting. We then asked respondents if they would like to participate in a research project about birding. Most people attending the Bird Fair were regular birders thus the request to participate in research about birding was generally met with agreement and enthusiasm.

We also collected data via an online survey from February 2013 to December 2013. The questionnaire was distributed through approximately 30 portals including: birding forums, birding email lists, social media pages for birding, direct emails to people in the birding or ornithological fields and requests to magazine and newsletter editors for their assistance in sharing the web link to the survey and distributing the link to their mailing lists (Table S1 in online Supplementary Material). In addition to collecting primary demographic information of each respondent, we asked questions about specific aspects of bird conservation (Table 1).

We explored responses to the open-ended question regarding the importance of bird conservation using an online word cloud tool (www.wordle.net) and the top 50 words used were quantified.

Table 1. Specific questions asked of birders regarding bird conservation and their respective sample sizes. Not all questions were answered and not all respondents gave their country of residence details, thus sample sizes do vary accordingly.

Survey Method	Online Survey	Face-to-Face Survey
Research Question 1 – Why do you think bird conservation is important?		
<i>This was an open-ended question where birders could respond by providing details about any area of bird conservation important to them.</i>		
Total response rate n = 295	n = 295	N/A
Responses per country	n = 235 Australia (n = 68) United States of America (n = 47) United Kingdom (n = 48) South Africa (n = 47) Other (n = 25) – omitted from subsequent analyses	N/A
Research Question 2 – Are you interested in learning more about bird conservation at this site? (N.B. Asked at Australian birding sites)		
<i>Birders were given the options; yes, no or uncertain to respond to this question</i>		
Total response rate n = 196	N/A	n = 196
Responses per country	N/A	n = 194 Australia (n = 119) United States of America (n = 32) United Kingdom (n = 19) Other (n = 24)
Research Question 3 – Should birders/government pay for conservation?		
<i>Birders were asked to respond using a five point Likert type scale from strongly disagree to strongly agree</i>		
Total response rate n = 271	N/A	n = 271
Responses per country	N/A	n = 271 Australia (n = 127) United States of America (n = 32) United Kingdom (n = 88) Other (n = 24)
Research Question 4 – Are you familiar with BirdLife International's Important Bird Area Program?		
<i>For this question birders were asked choose from the options – familiar, not familiar or uncertain</i>		
Total response rate n = 549	n = 266	n = 283
Responses per country	n = 258 Australia (n = 76) United States of America (n = 54) United Kingdom (n = 51) South Africa (n = 49) Other (n = 28) – omitted from subsequent analyses	n = 275 Australia (n = 128) United States of America (n = 32) United Kingdom (n = 90) Other (n = 26)

Common words (and, the, it, etc.) were removed as well as the key words from the question itself (bird, conservation and important). Full responses were subsequently coded for analysis. Categories used to code all responses were adapted from common definitions for natural resource valuation among the Western world, in the social and conservation literature (Table 2) (Byrne 1998, Wolch and Zhang 2004, Lindenmayer and Burgman 2005). Birders often gave responses that could not be assigned to only one value definition, and were thus given multiple counts to capture the myriad ways in which birders value bird conservation.

We examined the influence of sex, country of residence, age and education on awareness of the different conservation aspects. We conducted contingency analyses (with observed values compared to expected values as per standard chi-square analysis) and one-way analysis of variance (ANOVA) using IBM SPSS Statistics Version 22.

Results

General respondent summary

A total of 350 birders responded to the online questionnaire. Providing answers to questions was not mandatory, thus response rates to all questions varied (Table 1). The face-to-face questionnaire yielded 283 responses. For both face-to-face and online delivery methods, most respondents were male, 60% and 71% of the samples, respectively (65% combined). The average age of respondents was 56 for the face-to-face survey and 46 for the online survey. For both delivery methods, at least 70% of respondents had completed a tertiary degree. In the interests of retaining robust sample sizes, statistical analyses for the first research objective (i.e. how birders value bird conservation) were restricted to the four main countries where respondents reside (Australia, UK, USA and South Africa).

How birders value bird conservation

A total of 295 respondents provided an answer to the question “why do you think bird conservation is important?”. The five most frequently used words in their open-ended responses were; species ($n = 67$), ecosystem/s ($n = 63$), environment ($n = 61$), part (of) ($n = 59$), habitat ($n = 48$), health [ecosystem/environmental] ($n = 35$), natural ($n = 33$), world ($n = 30$), and biodiversity ($n = 29$).

After coding responses into categories and examining data accompanied by socio-demographics ($n = 210$), the top three categories were: general biodiversity ($n = 115$, 55%), ecological role of birds ($n = 84$, 40%) and the ability for birds to be indicators of changes in natural systems ($n = 69$, 33%) (Table 2). Birders often stated that while birds are deserving of conservation as species, their role in ecosystems and the importance of biodiversity was just as important. For example, some actual responses included the following; ‘*It cannot be in isolation. Biodiversity needs to be protected*’, ‘*Conserving birds means conserving habitat which directly helps with other species*’ and ‘*Because birds are an essential part of food webs and ecosystems - but it is about preserving habitats (on a landscape scale) and all of the wildlife within them rather than simply focusing on birds*’. Some respondents identified the role humans have had in degrading the environment, and that society has a responsibility to minimise their interference with nature. The potential for birds to be flagship species or economic assets was not a common feature of responses to this question, compared to other qualities.

Males and females were largely consistent in their reasons for why bird conservation was important. However, females recognised the ecological role birds play more than males (Fisher’s exact test, $P = 0.012$) (Table 2). Additionally, females appeared to value birds for their aesthetic appeal more than males, though this was not statistically significant (Fisher’s exact test, $P = 0.126$) (Table 2; Table S2). The need for humans (as stewards of nature) to conserve birds was recognised more by males than females, but was also not significant (Fisher’s exact test, $P = 0.109$).

Age had an effect on the reasons given for the importance of bird conservation. The ecological roles played by birds was recognised by younger birders (≤ 30 years old) more than expected and

Table 2. Values assigned to the responses for the importance of bird conservation by country, age and sex of respondent ($n = 210$). 'Other' countries excluded here due to low sample size.

	Value definition	Pearson's Chi Square Results - Country	Pearson's Chi Square Results – Age Group (up to 30, 31-60, 61 and over)	Fisher's Exact Test Results - Education	Fisher's Exact Test Results - Sex
General biodiversity conservation ($n = 115$)	Bird conservation is/should be about biodiversity conservation in general	$\chi^2 = 5.120$, $df = 5$, $P = 0.401$	$\chi^2 = 3.017$, $df = 2$, $P = 0.221$	$P = 0.304$	$P = 0.468$
Ecological role ($n = 84$)	The role of birds in the ecosystem is recognised – birds are pollinators/ dispersers, birds (e.g. raptors) aid in nutrient cycling etc	$\chi^2 = 12.310$, $df = 5$, $P = 0.031$	$\chi^2 = 7.574$, $df = 2$, $P = 0.023$	$P = 0.717$	$P = 0.012$
Indicator ($n = 69$)	Birds can be good indicators of change in the ecosystem as a whole	$\chi^2 = 5.391$, $df = 5$, $P = 0.370$	$\chi^2 = 8.951$, $df = 2$, $P = 0.011$	$P = 0.039$	$P = 0.484$
Aesthetic/personal wellbeing ($n = 51$)	Watching or hearing birds gives pleasure, birds are stunning/beautiful	$\chi^2 = 4.891$, $df = 5$, $P = 0.429$	$\chi^2 = 0.644$, $df = 2$, $P = 0.725$	$P = 0.270$	$P = 0.126$
Bequest ($n = 32$)	Birds should be conserved so future generations can enjoy them	$\chi^2 = 2.662$, $df = 5$, $P = 0.752$	$\chi^2 = 8.995$, $df = 2$, $P = 0.011$	$P = 0.776$	$P = 1.000$
Intrinsic ($n = 29$)	Birds have a right to exist independent of humans	$\chi^2 = 4.071$, $df = 5$, $P = 0.539$	$\chi^2 = 4.116$, $df = 2$, $P = 0.128$	$P = 1.000$	$P = 0.648$
Flagship ($n = 24$)	Birds can be figure-heads or icons of wider conservation issues	$\chi^2 = 3.632$, $df = 5$, $P = 0.604$	$\chi^2 = 2.350$, $df = 2$, $P = 0.309$	$P = 0.750$	$P = 0.786$
Stewardship ($n = 20$)	We have a responsibility to not damage the environment but protect it	$\chi^2 = 5.275$, $df = 5$, $P = 0.383$	$\chi^2 = 0.032$, $df = 2$, $P = 0.984$	$P = 0.212$	$P = 0.109$
Economic ($n = 10$)	Birds can provide economic benefits via tourism and recreation	$\chi^2 = 2.948$, $df = 5$, $P = 0.708$	$\chi^2 = 1.892$, $df = 2$, $P = 0.388$	$P = 0.357$	$P = 0.691$

less than expected by mature birders (aged 61 and over) ($\chi^2 = 7.574$, $df = 2$, $P = 0.023$). Conversely, the role birds play as indicator species was identified more than expected by mature birders (aged 61 and over) and less than expected among younger birders (≤ 30) ($\chi^2 = 8.951$, $df = 2$, $P = 0.011$). Younger birders identified bird conservation as important for future generations (i.e. bequest value) more than was expected ($\chi^2 = 8.995$, $df = 2$, $P = 0.011$).

Education and country of residence (as far as those surveyed here) had little effect on the ways birders value bird conservation. Exceptions include; the ecological role played by birds where Australian respondents appear to place more value on this role than respondents from other countries ($\chi^2 = 12.310$, $df = 5$, $P = 0.031$) (Table 2; Table S2) and the importance of birds as indicators, where tertiary educated birders had higher than expected responses (Fisher's exact test, $P = 0.039$).

Interest in learning about bird conservation at birding sites

Most birders would like to learn more about the conservation of birds at birding sites (yes; $n = 125$, no; $n = 30$, uncertain; $n = 41$). Australian birders want to learn about bird conservation more than was expected, while birders from the USA were less interested in learning about conservation at birding sites ($\chi^2 = 19.526$, $df = 8$, $P = 0.012$). There was no significant difference between birders' desire to learn more about conservation at birding sites with respect to age ($\chi^2 = 4.585$, $df = 4$, $P = 0.333$), sex ($\chi^2 = 3.658$, $df = 2$, $P = 0.161$) or education (Fisher's exact test $P = 0.504$).

Who should pay for bird conservation?

Generally, birders agree with the statement 'I believe that birders should make contributions to assist bird conservation when visiting key sites for birds', with a mean score of 3.98 on a scale of 1–5, where five is the strongest level of agreement with the statement (Table 3). They also showed agreement with the statement 'I believe that government should be the main funders of bird conservation', with a mean score of 3.84.

There was no significant difference between males and females and education level with respect to either statement (Figure S1), nor did age affect the level of agreement with government being the main funders of bird conservation. However younger respondents (≤ 30 years old) were more inclined to agree that birders should make contributions to bird conservation ($F = 5.692$, $df = 2$, $P = 0.004$) (Figure S1).

UK birders showed a higher level of agreement that birders should contribute to bird conservation than both Australian and US birders ($F = 3.271$, $df = 4$, $P = 0.012$) (Figure S1). Country of residence was not a good predictor of whether birders think governments should be the primary funders of bird conservation (Figure S1).

Awareness of BirdLife International's IBA Programme

Almost 43% of the 534 birders responding to this question stated that they were familiar with the BirdLife International IBA programme. A further 21% were uncertain if they were familiar with the programme and 36% were unfamiliar with the IBA programme (Table 4). More males were familiar with the IBA programme than females ($\chi^2 = 20.276$, $df = 2$, $P < 0.01$), with similar proportions expressing uncertainty about their IBA awareness.

Birders in the age groups ≤ 30 and 31–60 had the highest rates of familiarity with the IBA programme ($\chi^2 = 26.246$, $df = 4$, $P < 0.01$) (Table 4). Despite having higher rates of familiarity, respondents in the ≤ 30 group also had high rates of uncertainty about their awareness of the IBA programme. More respondents in the 61 and over age group stated that they were unfamiliar with the IBA programme than those that were familiar.

Australian respondents had the least familiarity with the IBA programme (as a proportion of the number of respondents for each country) ($\chi^2 = 70.257$, $df = 8$, $P < 0.01$) (Table 2) and most South African residents indicated they were familiar with the IBA program

Table 3. Birders' level of agreement with the two statements ($n = 271$); 'I believe that birders should make contributions to assist bird conservation when visiting key sites for birds' and 'I believe that government should be the main funders of bird conservation'. BP = Birders pay; GP = Governments pay. Mean calculated by assigning values: 1 to Strongly Disagree, 2 to Disagree, 3 to Not Sure, 4 to Agree and 5 to Strongly Agree. The closer the mean is to five the higher the level of birder agreement with the statement.

Region	<i>n</i>	Mean Score		Strongly Disagree		Disagree		Not Sure		Agree		Strongly Agree	
		BP	GP	BP (%)	GP (%)	BP (%)	GP (%)	BP (%)	GP (%)	BP (%)	GP (%)	BP (%)	GP (%)
Australia	127	3.86	3.87	1.6	2.4	6.3	7.1	15.0	11.8	59.1	58.3	18.1	20.5
UK	88	4.19	3.75	2.3	0.0	3.4	12.5	5.7	19.3	50.0	48.9	38.6	19.3
USA	32	3.69	3.69	6.3	3.1	3.1	15.6	21.9	15.6	53.1	40.6	15.6	25.0
Other	24	4.21	4.21	0.0	0.0	0.0	8.3	25.0	12.5	29.2	29.2	45.8	50.0
All respondents		3.98	3.84	2.2%	1.5%	4.4%	10%	13.7%	14.8%	52.8%	50.6%	26.9%	23.2%

Table 4. Level of birder familiarity with BirdLife International's IBA* program.

IBA Familiarity	Yes <i>n</i> (%)	No <i>n</i> (%)	Uncertain <i>n</i> (%)	Pearson's Chi Square Results
All (<i>n</i> = 534)	229 (42.9%)	193 (36.1%)	112 (21%)	
Sex	obs/exp	obs/exp	obs/exp	
Male (<i>n</i> = 351)	174/151	107/127	70/74	$\chi^2 = 20.28$, <i>df</i> = 2, <i>P</i> < 0.01
Female (<i>n</i> = 183)	55/79	86/66	42/38	
Age group	obs/exp	obs/exp	obs/exp	
up to 30 (<i>n</i> = 79)	34/34	19/29	26/17	$\chi^2 = 26.25$, <i>df</i> = 4, <i>P</i> < 0.01
31-60 (<i>n</i> = 270)	129/116	83/98	58/57	
61 and over (<i>n</i> = 185)	66/79	91/67	28/39	
Country of residence	obs/exp	obs/exp	obs/exp	
Australia (<i>n</i> = 204)	58/88	109/74	37/43	$\chi^2 = 70.26$ <i>df</i> = 8, <i>P</i> < 0.01
United Kingdom (<i>n</i> = 141)	57/61	46/52	41/30	
United States (<i>n</i> = 86)	41/37	25/31	20/18	
South Africa (<i>n</i> = 49)	38/21	4/18	7/10	
Other (<i>n</i> = 54)	35/22	10/19	9/11	
Highest level of education completed	obs/exp	obs/exp	obs/exp	
Primary (<i>n</i> = 18)	3/8	11/7	4/4	$\chi^2 = 12.69$, <i>df</i> = 6, <i>P</i> = 0.048
Secondary (<i>n</i> = 60)	22/26	29/22	9/13	
Technical/Vocational (<i>n</i> = 46)	19/20	14/17	13/10	
Tertiary (<i>n</i> = 410)	185/176	139/148	86/86	

*IBA = Important Bird and Biodiversity Area

(familiar *n* = 38, expected *n* = 21). Respondents residing in the UK and USA had similar results, having slightly more familiarity with the IBA programme than being unfamiliar or uncertain about it.

Education appears to have a positive effect on the level of familiarity with the IBA programme ($\chi^2 = 12.686$, *df* = 6, *P* = 0.048). Respondents with higher levels of education (both vocational and tertiary) tended to be more familiar with the IBA programme (Table 4). Conversely, respondents with primary and secondary school level educations only responded more often that they were unfamiliar or uncertain about the IBA programme.

Discussion

Values of bird conservation

Our paper has extended the current knowledge base by examining the relationship between birders from different socio-demographic groups and their attitudes and knowledge of bird conservation and management issues. In general, birders expressed a genuine concern for birds, as demonstrated by their largely ecocentric (i.e. non-anthropocentric values; Thompson and Barton 1994) responses to why bird conservation is important. Understanding birder attitudes to conservation has previously been examined by presenting respondents with statements about conservation and then assessing their levels of agreement with those statements (Green and Jones 2010, Glowinski and Moore 2014). By asking birders about their attitude towards conservation in an open-ended manner we gained a broader insight into the ways in which people value birds and removed potential biases associated with the provision of set response options. More importantly we were able to detect that birders value conservation holistically, rather than just birds in isolation. For example, more than half of the birders, across all socio-demographic groups, framed their response to the open-ended question in the broader terms of general biodiversity conservation. The general biodiversity appreciation among birders supports the recent move by BirdLife International to reframe IBAs as Important Bird and Biodiversity Areas. The role birds can play as flagships for conservation (Veríssimo *et al.* 2013) and their

use as biological indicators of ecosystem health and function (Gregory *et al.* 2003) also provides justification for this shift.

Many birders also recognised birds' ecosystem roles, demonstrating an appreciation of the complexity of the natural world and the need to conserve ecosystem function. Australian birders in particular recognised the ecological role that birds play, which complements the findings of a recent study finding Australians also place significant value on threatened birds (Zander *et al.* 2014). This could be attributed to the fact that birds are responsible for plant pollination and seed dispersal in Australia, more than any other continent (Ford *et al.* 1979, Low 2014). Younger birders and female birders were also more likely to recognise the ecological importance of birds in their responses, which is more challenging to explain. We could speculate that a deeper understanding of ecological processes is associated with advancements in education among these groups in recent times.

Anthropocentric values (e.g. economic, aesthetic and bequest values) as drivers for bird conservation were less prevalent among respondents. This is interesting given the economic argument is often used to promote the benefits of supporting the birding industry (Dickie *et al.* 2006, Lee *et al.* 2010, Simango 2011, Li *et al.* 2013). While the economic potential of the industry has been explored and well documented (Steven *et al.* 2014), we have found this is not a major factor in why birders want to conserve birds. As such, arguing for conservation based on economic grounds is unlikely to win more conservation support from the birding population.

There may be any number of factors that drive the value system to which individuals subscribe (Byrne 1998), but given the growth in bird tourism, the role of tourism companies and operators may be important. For example, the role that bird tourism operators and their own conservation ethos plays in imparting information to birders has been under-examined. This aspect has been explored in other nature-based tourism sectors such as reef tourism (Biggs *et al.* 2012). A recent study has touched on the role of IBAs in avitourism itinerary advertising (Steven *et al.* 2015) which may shed some light on this relationship. However, further research is needed to understand the role of tourism operators' conservation ethos, their birding practices and their influence on their clients.

Funding and political support of bird conservation

Securing funding for conservation continues to challenge natural area managers, in both protected and unprotected landscapes (McCarthy *et al.* 2012, Balmford *et al.* 2015). Diversified funding sources may provide resilience against economic perturbations for conservation practitioners and alleviate some (but not all) pressures placed on governments (Emerton *et al.* 2006, Dudley *et al.* 2014, Eagles 2014). Our findings suggest that birders are in favour of multiple funding sources for bird conservation, including making contributions themselves. The debate around entrance fees to protected areas has been active for some time (Buckley 2003, Chung *et al.* 2011), however it has been demonstrated that tourism revenue does contribute to vertebrate conservation (Buckley *et al.* 2012, Morrison *et al.* 2012, Steven *et al.* 2013). Birders should, at the very least, be given the opportunity to contribute to conservation, or perhaps join bird conservation organisations when they visit birding sites. The logistics of this would require a collaborative effort between public and private protected area managers and local bird conservation organisations (e.g. BirdLife branches, RSPB, other conservation NGOs). Where bird conservation groups are the landowners, (e.g. reserves in the UK owned by the RSPB and The Wildlife Trusts), there are already entry or membership fees imposed to fund conservation works and further land acquisition. These reserves serve as a positive example of what is possible for other landowners and conservation practitioners.

Despite a willingness to make their own contributions, birders felt that governments should remain the main funder of conservation. This was, however, not as evident as the willingness for birders to contribute. This could be an artefact of respondents having less faith in governments to fund conservation requirements, or it could represent an underestimation by birders of the funding needed to sufficiently conserve birds (McCarthy *et al.* 2012, Butchart *et al.* 2015). This is cause for concern with the countries examined here, most (if not all) of which are signatories or parties to various international agreements regarding biodiversity conservation (e.g. Ramsar, Convention on Biological Diversity etc.).

Awareness of bird conservation practice and the global IBA network

The sequential uptake of the IBA programme in different regions may explain the variation in familiarity among birders. South Africa and the USA had the highest levels of familiarity and these countries began establishing their IBAs in the mid to late 1990s (Barnes 1998, CEC 1999). Australia did not formally establish an IBA network until 2009 (Dutson *et al.* 2009), thus the lowest levels of familiarity among Australian birders could be explained by this time lag. Despite this, in recent years the advent of social media and information sharing through digital means have provided opportunities for environmental organisations to inform the public faster than ever before of conservation issues and actions. Many organisations use such portals to update members and supporters on topical issues and rally support for those issues.

Our data demonstrate that birders, by and large, want to learn more about the birds they watch at key sites. This is especially the case for Australian birders. Therefore, despite having the lowest levels of familiarity with the IBA programme, this is exactly the type of issue that Australian birders want to know more about. Furthermore, birders may also be willing to pay for educational and interpretive services at birding sites (Green and Jones 2010, Kim *et al.* 2010, Lee *et al.* 2010). Signage at birding sites, provision of information on tourist information websites and topical social media campaigns by bird conservation groups are just two ways that this improved education could be initiated (McKay 2007). Birders from the USA were less enthusiastic in their desire to learn more about bird conservation. It is difficult to say why this was the case as the issue has been under examined to date. One might speculate there is already adequate availability of such information among American birders (e.g. community groups, magazines, newsletters etc.). Given the size of the birding population in the USA (up to 47 million) (Carver 2011), a deeper examination is warranted.

We have found that birders value birds more for ecocentric than for anthropocentric reasons. Despite this, it appears that there are opportunities to extend their concern for birds by increasing their knowledge and understanding of practical conservation measures. While some birders do contribute to conservation (e.g. monetary contributions, political support for conservation), they may not fully appreciate what their contributions are used for or where more investment is required. We suggest an increased dialogue between birders and the bodies promoting bird conservation. If birders are to be effective advocates of bird conservation, our findings suggest there is scope for improvement in engagement between them and bird conservation practitioners. Focusing transparent and effective communication efforts on an already nature-oriented group may yield greater benefits for all parties involved.

Supplementary Material

To view supplementary material for this article, please visit <https://doi.org/10.1017/S0959270916000174>

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