Citation: Steven, R., Morrison, C. & Castley, J.G. (2014). Bird watching and avitourism: A global review of research into its participant markets, distribution and impacts, highlighting future research priorities to inform sustainable avitourism management. *Journal of Sustainable Tourism*. Available from <http://dx.doi.org/10.1080/09669582.2014.924955>

Bird watching and avitourism: A global review of research into its participant markets, distribution and impacts, highlighting future research priorities to inform sustainable avitourism management.

Rochelle STEVEN^{*a}, Clare MORRISON^b & J. Guy CASTLEY^a

^a*Environmental Futures Research Institute, Griffith School of Environment
Griffith University, Gold Coast campus, Gold Coast, 4222, Australia*

^b*Griffith School of Environment, Griffith University, Gold Coast campus, Gold Coast, 4222, Australia*

*Corresponding author. Email: rochelle.steven@griffithuni.edu.au

*Phone: +61755527338

Abstract

Avitourism is an emerging sub-sector of the nature-based tourism industry, where tourist travel motivations are focused around birdwatching. Certain aspects of the industry are yet to be examined adequately. This paper reviews patterns among 66 research studies published between 1989 and 2014 that examine avitourism, its participants and stakeholders across several research themes. There is a distinct northern hemisphere bias ($n = 46$) in avitourism research effort, with research dominated by the studies of the avitourists themselves ($n = 35$).

Key objectives of studies reviewed were primarily concerned with the economic impacts of avitourism ($n = 21$), the motivations of birders as avitourists ($n = 18$) and increasing our understanding of the avitourism market ($n = 12$). Ten studies specifically examined the types of birds or bird-related events (i.e. migrations) avitourists seek. Few studies ($n = 6$) have examined the negative impacts on birds arising from avitourism. The sustainability of avitourism is dependent upon understanding both the avitourism product and the willingness of avitourists to see particular species. Enhanced understanding of avitourism opportunities and avitourist desires could guide industry growth, assist the economies of many communities, highlight birds and habitats vulnerable to the negative impacts of avitourism, and help finance conservation work. A series of priority research themes are outlined.

Keywords: birds; birdwatching; bird conservation; ecotourism; nature-based tourism

Introduction

Birdwatching tourism (or avitourism) is a niche sector of the nature-based tourism market (Biggs, Turpie, Fabricius, & Spenceley, 2011; Newsome, Dowling & Dowling, 2005; Şekercioğlu, 2002). The popularity of birds as interesting wildlife to watch among the wider community, increasing disposable income and the growing affordability of travel, has extended avitourism beyond the historical practice of localised birdwatching (Cordell & Herbert, 2002; Moss, 2004; Şekercioğlu, 2003), such that it has become a global pull factor in travel decision-making (Dooley, 2007; Moss, 2004). Avitourists are also reported to be among the most sensitive to nature conservation (Hvenegaard & Dearden, 1998a) providing reinforcement for avitourism being one of the most sustainable nature-based tourism activities (Connell, 2009; Li, Zhu, & Yang, 2013). Avitourists, especially the most dedicated, travel great distances to watch birds in various locations that often exhibit high species diversity and endemism (Connell, 2009). The travel costs associated with birdwatching place avitourists amongst the wealthiest nature-based tourists in the market place (Cordell & Herbert, 2002; Hvenegaard, Butler, & Krystofiak, 1989; Kerlinger, 1993; Şekercioğlu, 2003).

Research interest in avitourism is still relatively embryonic compared with higher order markets such as nature-based or wildlife tourism. Previous studies also tend to be segment specific. For instance, there are those investigating birdwatchers from a social science perspective, characterising their activities along a recreational specialisation spectrum (e.g. McFarlane, 1994; McFarlane & Boxall, 1996; Scott, Ditton, Stoll, & Eubanks Jr, 2005). Narrative commentaries and reviews of the industry discuss birdwatchers as both hobbyists and tourists (Bonta, 2010; Connell, 2009; Cordell & Herbert, 2002). Furthermore, economists have examined the positive contribution birdwatchers can have for local communities at birdwatching destinations, especially for birdwatching festivals and migration events (Hvenegaard et al., 1989; Kerlinger, 1993; Lawton, 2009; Measells & Grado, 2007). Only

since the early 2000s has the natural science community begun to show an interest in the field, with studies touching on the potential positive and negative impacts of birdwatching on avian communities (Biggs et al., 2011; Jones & Neelson, 2005; Puhakka, Salo, & Sääksjärvi, 2011; Şekercioğlu, 2002). While some of these studies do mention the potential hazards specific to avitourism, this pales in comparison to the large body of literature assessing the negative impacts of nature-based and general tourism on birds and their habitats (Steven, Pickering, & Castley, 2011).

Notwithstanding the above, there is little appraisal of the breadth or nature of the research itself. Some aspects of avitourism are less well understood than others and our review advances current knowledge by addressing the following questions: (1) Where has most research on avitourism been conducted? (2) What types of research questions are being examined within the avitourism literature? (3) Where is research about avitourism being disseminated or published? (4) What methods are currently being used to answer questions about avitourism? (5) What aspects of avitourists' preferences and awareness have been assessed? (6) What are the challenges for the growth and enhancement of avitourism?

In the interests of economic, social and environmental sustainability, there is a need to increase our understanding of specific components of the industry to guide industry growth, encourage more tangible benefits for the birds tourists watch. In addition, the opportunities for increasing social capital via the economic benefits to local communities, and for gaining environmental benefits to birds and habitats, are global in extent. There is also a strong case for assessing the most important areas for future research efforts to be concentrated, along the lines of Eagles (2014) who put forward 10 priority areas on which to focus future research into the management of tourism in protected areas.

Methods

This study uses a quantitative systematic review method for identifying and selecting the relevant studies (in the sense described by Petticrew and Roberts, 2006), that has been successfully applied in recent environmental assessments (Roy, Byrne, & Pickering, 2012; Steven et al., 2011). This method was chosen for two key reasons; 1) avitourism research is a multi-disciplinary and an emerging research area, making a meta-analysis approach inappropriate and 2) rather than a typical narrative review, the aim of this study was to quantify the drivers of contemporary avitourism research effort, thereby enhancing our understanding of the field. This approach is useful for identifying the aspects of avitourism that are fairly well researched and understood. More importantly, it is able to isolate aspects that merit further investigation by researchers from different fields of expertise (Guitart, Pickering, & Byrne, 2012).

Literature published about avitourism (i.e. journal articles, technical reports, theses, specialist media) in the English language were obtained from systematic searches of electronic databases including Google Scholar, ISI Web of Science and Science Direct between January 2012 and September 2013. Specific keywords used in searches included birdwatching, bird watching, birding and birder in combination with other terms including tour, tourism, event, festival and ecotourism. The term avitourism was also used in searches, though the use of this term is relatively new to the field and yielded fewer search results. Here, we define avitourism as the motivated participation in birdwatching as either the sole purpose or a key element of travel. All content was searched using the keywords with subsequent screening of titles and abstracts.

Papers published in peer-reviewed journals including those from the tourism, social science and environmental science disciplines dominated all materials retrieved. Some

reports/theses were also sourced from cooperative research centres, online university libraries, specialist birdwatching journals and conference proceedings. Due to the emerging status of this research discipline, all publications submitted for review or independent examination were included. Similarly, no exclusive time frame was stipulated, hence research reviewed covered a period of over 20 years (1989-2014). To ensure that all relevant literature was included, a forward and backward citation analysis was completed for each publication sourced through initial searches to identify further pertinent papers and publications on the topic. Where available electronically, these studies were subsequently included.

Studies that examined birdwatching as a recreational activity or leisure pastime without a strong tourism-based (i.e. travel) context were excluded. There are also numerous studies examining the relationship between the general and nature-based tourism more broadly and the associated negative impacts on birds (see reviews by Buckley, 2004; Steven et al., 2011). However, these do not deal explicitly with birdwatching tourists, as is the focus here, and were therefore not included as part of this review. This review also focused on birds in the wild as a tourist attraction, rather than more direct interactive activities such as feeding (e.g. Jones & Reynolds, 2008; Jones, 2011) and viewing birds held in captivity (i.e. zoos).

Information from each of the resultant 66 studies was recorded in a database including author, year of publication, country of focus for each study, title of journal or media in which it was published, the methods used in the study, the key objectives of the research, and, for studies using surveys of avitourists or avitourism operators, what types of questions respondents were asked.

Results

Geographic distribution of research

Twenty-four of the 66 studies examined avitourism or avitourists in the United States of America (Table 1). Six studies were undertaken in Australia, four in the United Kingdom, five in South Africa, three in Canada, three in Thailand and three studies assessed some aspect of birdwatching at a global scale. Overall, northern hemisphere studies ($n = 46$) dominated those from the southern hemisphere ($n = 17$).

Objectives of research examining avitourism

Questions directly related to the economic aspects of avitourism were the basis for 21 studies (Table 2). These studies examined trip expenditures associated with avitourism and how local economies receive income from avitourists visiting various destinations. Eighteen studies were specifically interested in the motivations of avitourists (i.e. why they participate in birding activities?) and 12 studies were designed to increase market understanding of avitourism by assessing the destination characteristics that appealed to avitourists. Nine studies assessed the importance or centrality of birdwatching to the tourist's lifestyle using a recreation specialisation approach. Five papers specifically set out to assess the utility of avitourism for community development in developing countries. While many studies ($n = 28$) collected superficial avitourist demographic data, only five studies completed a specific detailed demographic analysis of avitourist groups. Three of the papers did not indicate clear objectives or research questions; however, these were written in the style of a review or commentary about avitourism in largely general terms.

Research questions directly related to conservation (i.e. avian and general) were investigated by 15 of the 66 studies. The negative environmental impacts associated with avitourism were a specific focus for only six studies, two of which were by the same author. Despite 24 of the reviewed studies making mention of the potential negative impacts from

155 avitourism, the extent of the impacts, and their effects, was generally not substantiated
156 through empirical analyses. Furthermore, the potential impacts were not necessarily specific
157 to the birds being watched, or to birdwatching, but more often referred to the wider impacts
158 of overuse in a natural area. Twelve studies highlight the use of playback of bird calls
159 (usually using an iPod or smart phone) as a potential threat from avitourism; however, this
160 also has not been quantified in terms of its prevalence of use in birdwatching.

161 ***Publication platforms and research dissemination pathways***

162 Avitourism research is widely disseminated in journal articles ($n = 33$), conference
163 proceedings ($n = 10$) and technical reports ($n = 7$) (Table 1). Contributions have also been
164 made to the discipline through master's research theses ($n = 5$), and cooperative research
165 centre reports ($n = 4$). A small number of studies were specialist articles, book chapters and
166 NGO (non-governmental organisation) technical reports.

167 Many studies published were from within the tourism field ($n = 21$), 10 from the
168 natural resource management area and 8 from the natural science discipline. Seven studies
169 were published in ornithological journals, seven for social science media and five master's
170 theses. The remaining studies encompassed the conservation, geography and a variety of
171 other general-themed media.

172 ***Methodological approaches in avitourism research***

173 More than half of the reviewed studies ($n = 41$) used questionnaire surveys of
174 avitourists ($n = 35$), avitourism operators ($n = 13$), or both of these sources ($n = 7$) in the
175 collection of primary data. Sixteen studies were published reviews or commentaries about the
176 avitourism industry itself. These studies used a combination of primary and secondary data as
177 well as personal experience to discuss the potential positive and negative aspects associated

with the industry, or presented profiles of several locations (i.e. Nepal, Australia, Israel, etc.), where avitourism may be an opportunity for economic development. Eleven studies conducted secondary data analyses often using human population census data or other national survey data commonly collected in the United States. Nine studies analysed biological data about the birds or bird habitats, using data collected either in the field or via desktop analyses.

Avitourists preferences and their relationship with the birds they watch

Avitourists surveyed via questionnaires ($n = 35$) were most often asked about their demographics (i.e. age, income, residency, etc.) ($n = 28$), trip and gear expenditures ($n = 15$ and $n = 8$ respectively) and the importance of the activity of birding to them ($n = 17$). Questions about their preferences regarding other aspects of the avitourism experience were also asked, including accommodation and food preferences ($n = 10$), the importance of educational or interpretive activities ($n = 9$) and the importance of the provisioning of other activities ($n = 12$). Researchers also asked avitourists where most of their information about avitourism destinations was sourced from ($n = 8$) (i.e. Internet, books, word of mouth, etc.).

Despite the importance of birds to this niche market of tourists, only 10 studies asked avitourists about the types of birds or biological events (i.e. migrations) that were important motivating factors for their travel choices. For example, four studies specifically asked about the importance of rare or endemic species being present at a viewing destination and seven studies asked about the importance of bird diversity (i.e. richness and abundance of birds). Two studies asked whether seeing new species (for the avitourist) was important. Five studies asked survey respondents about the specific birds they watch, either by directly mentioning a species or asking respondents to state species preferences. Some studies asked about only one

of these aspects (i.e. importance of rare species, diversity, specific species, etc.) ($n = 5$), while others asked about two or more ($n = 5$).

Relatively few studies examined the relationship between avitourists or avitourism operators and the conservation of birds. Five studies used questionnaire responses to gauge conservation awareness among avitourists. Eight studies directly asked avitourists about their commitment to conservation. For example, questions asked included whether the avitourist was or has been a member of a conservation organisation (for birds specifically, or general conservation), and whether they had made donations locally (i.e. the destination) or closer to home. One survey sought to determine whether birding festivals were held as a means to raise money for avian conservation, in addition to providing an opportunity to meet others in the birding fraternity.

Challenges to the success and growth of avitourism

Twenty-nine studies identify challenging processes or attributes that present obstacles to the growth of avitourism in particular locations. Biological impacts ($n = 18$) and a lack of man-made infrastructure (e.g. road networks, accommodation, birding hides, etc.) ($n = 14$), were identified as challenges to the success or growth of avitourism, either by the authors or by respondents to surveys. Socio-political instability ($n = 9$), arduous environmental conditions ($n = 7$) and access issues due to land tenure arrangements ($n = 3$) were also listed as obstacles.

Discussion

222 This review presents a quantitative summary of global avitourism research effort. As
223 such, this paper is the first to identify the general patterns and regional biases associated with
224 contemporary avitourism research.

225 The approach taken and style of this review is different to that of reviews on
226 birdwatching and avitourism previously published (Connell, 2009; Şekercioglu, 2002), but
227 the systematic method used was appropriate for the aims of this study. Previous reviews of
228 birdwatching have often examined articles published in non-academic literature/journals or
229 books. This demonstrates that until recently avitourism as a special-interest tourism niche
230 market appears to have received less attention within the peer-reviewed research.

231 There are examples of other niche wildlife tourism markets (e.g. whale watching,
232 shark diving and orchid tourism) with corresponding reviews or commentaries regarding the
233 status of such industries (Gallagher and Hammerschlag, 2011; O'Connor, Campbell, Cortez,
234 & Knowles, 2009; Pickering and Ballantyne, 2013; Topelko & Dearden, 2005). The trends
235 within research on these industries show some similarities and differences to the trends found
236 here. For example, for shark and whale watching tourism, reviews have often focused on the
237 economic potential for both conservation and community development. (Gallagher and
238 Hammerschlag, 2011; O'Connor et al., 2009; Topelko & Dearden, 2005). For avitourism, this
239 review has found that a large proportion of the research examines the economic benefits and
240 motivational attributes of the participants.

241 ***Geographic limitations of avitourism research***

242 Avitourism research is currently regionally biased with a distinct focus from the
243 northern hemisphere and North America in particular. Similar patterns have previously been
244 reported within the recreation ecology literature (Buckley, 2004; Pickering, Hill, Newsome,
245 & Leung, 2010; Steven et al., 2011). For avitourism, this is partially explained by the fact that

birdwatching has been a part of the recreational culture in North America for over a century (Connell, 2009; Moss, 2004). However, with a population density many times that of North America (Population Reference Bureau, 2011) and an equally long history and continued popularity of birdwatching (Moss, 2004), it is surprising there are not more studies from the United Kingdom.

There is a clear disparity between the centres of avian diversity, arguably some of the most attractive destinations for avitourists, and the selection of study sites for research on avitourism and avitourist perceptions (Table 3). For example, South American countries boast the greatest global diversity of birds, yet there appear to be no studies assessing the status quo of avitourism for the majority of these countries. Only two studies identified by this review specifically examined avitourism in South America, focusing on the opportunities to enhance the industry in Peru and Brazil (Bernardon & Nassar, 2012; Puhakka et al., 2011). Furthermore, despite Australasia's relatively high global levels of avian diversity and endemism, few studies have assessed the avitourism industry in either Australia or New Zealand using primary data collected across multiple sites. Notable exceptions are one study that assessed the negative impacts of birdwatching on bird communities (Jones & Nealson, 2005) and another that surveyed avitourists about their practices, attitudes and needs as visitors to birding sites (Green & Jones, 2010), both of which were in Australia.

The multi-disciplinary nature of avitourism research

The attention paid to birdwatchers and birdwatching in the available literature highlights the multi-disciplinary nature of the field. Studies include those from the social sciences, geography, tourism, conservation science, recreation ecology and economics. These varied academic perspectives have resulted in myriad research questions, with little opportunity for development within sub-disciplines. Consequently, many questions still

remain unanswered. For example, we generally know little about the types of birds and birding destinations that appeal to avitourists and more about the birdwatchers themselves (i.e. specialisation and commitment) (Burr & Scott, 2004; Conradie, van Zyl, & Strasheim, 2013). Furthermore, we have little knowledge of the global significance of avitourism as an industry, as demonstrated by the lack of national or regional assessments above.

The social science community has shown avid interest in birdwatchers, given the dedication and commitment exhibited by certain groups in the birdwatching market. This research has highlighted that the birdwatching community is highly heterogeneous, comprising sub-groups from the casual to the completely engaged (Cole & Scott, 1999; Lee & Scott, 2004; Maple, Eagles, & Rolfe, 2010; McFarlane, 1994; Simango, 2011). Of the research examining the tourism context, a substantial focus has been directed towards the economic incentives for local tourist markets (Dickie, Hughes, & Esteban, 2006; Hodur, Leistritz, & Wolfe, 2004; Hvenegaard et al., 1989; Isaacs & Chi, 2005) and the preferences of avitourists with respect to the tourism experience (Che, 2003; Kim, Keuning, Robertson, & Kleindorfer, 2010; Scott & Thigpen, 2003).

Knowledge about birder motivations and expectations with respect to the broader tourism experience and quantifying the economic benefits to local communities are very important to enhancing avitourism. However, so too is increasing the understanding of the desired product that avitourists want to see and the implications from use of that product (i.e. positive or negative impacts). While bird diversity, endemic species and rarities are all important pull factors in avitourism, these are likely to differ from region to region (i.e. supply), as well as for different avitourists based on their residency (i.e. demand).

Implications for avian conservation

Tourism activities in general have the potential to threaten bird communities (Steven & Castley, 2013). However, there is a paucity of research examining the negative impacts associated specifically with avitourists, as opposed to nature-based or ecotourists more generally (Şekercioğlu, 2002). This is particularly deserving of further examination as there are activities specific to avitourists that are potentially harmful to birds (e.g. using recorded call playback to encourage birds into view, approaching birds closely for identification purposes) (American Birding Association [ABA], 2003; Birds of India, 2009; Şekercioğlu, 2002). This continues to be flagged within the literature, as found here, but as yet there is little quantification of its prevalence in the tourism setting. In theory, call playback disturbs birds from normal activity (or inactivity) and is of concern as this can cause unnecessary energy expenditure (Birds of India, 2009; Şekercioğlu, 2002). Of course, the severity of the impact may be a function of the duration, extent, intensity and timing of the disturbance to birds as highlighted by Steven et al. (2011).

Some may argue that some disturbance of birds is justified under certain circumstances. For example, the use of call playback is frequently used in ecological studies (e.g. population census, species monitoring, etc.) (Gregory, Gibbons, & Donald, 2004; Hale, 2006). That said, the possible impacts of an avitourism operator using call playback at the same site repeatedly over time may raise some concerns. This is especially the case when the same pair of birds is targeted during breeding seasons, or for birds that are threatened. While many ornithological societies have code of conduct principles regarding the use of playback, encouraging birdwatchers to be mindful of the disturbance it may pose to birds, none of them actually stipulate a position of complete opposition to its use in the field (ABA 2003; BirdLife Australia, 2012; MacKinnon, 2004). None of the studies reviewed here collected primary data examining call playback activity in terms of prevalence of use in avitourism, or impacts on birds. One study asked avitourists if they would sooner disturb a bird than miss

the identification of a species, and most responded saying that they would not disturb the bird (Green & Jones, 2010). However, it remains difficult to relate these survey sentiments to actual activities in the field. Therefore, empirical data to quantify the prevalence and potential impacts of these avitourism impacts are required.

Despite the potential negative impacts avitourism can have on birds, it is suggested that avitourists can make substantial contributions to avian conservation (Puhakka et al., 2011; Şekercioğlu, 2003). Recent evidence suggests that general tourism in protected areas is contributing to avian conservation efforts (Steven, Castley, & Buckley, 2013). However, while the potential for positive conservation outcomes from avitourism have long been used as a justification for the industry's enhancement, these outcomes have not been demonstrated with species or site-specific empirical data as yet. Studies reviewed here do touch on this potential contribution through questions asked of avitourists as part of larger surveys (Eubanks Jr, Stoll, & Ditton, 2004; Green & Jones, 2010; Hvenegaard, 2002). However, asking whether an avitourist is a member of a conservation organisation, regardless of whether it focuses its efforts on bird conservation or not, does not demonstrate actual bird conservation at a visited destination. This was a key point raised by a study in Thailand's Doi Inthanon National Park by Hvenegaard (2002). For frequently visited protected areas in developing countries, which are often in dire need of external fund raising mechanisms (Bovarnick, Fernandez-Baca, Galindo, & Negret, 2010; Emerton, Bishop, & Thomas, 2006), this presents both a challenge and an opportunity. It is also unclear what contribution avitourism operators make to conservation, despite the fact that they rely on intact avian habitats (often captured within protected or ecologically significant areas) for the sustainability of their industry (Şekercioğlu, 2003).

Future directions

Avitourism impact research appears to be poorly integrated across the social science, natural science and conservation disciplines with limited detailed analysis of either positive or negative contributions made by avitourism. This is surprising given its place in the wider ecotourism industry, where mindfulness of the triple bottom line is imperative for ethical and sustainability practices (Wight, 2007). Furthermore, tangible community development benefits arising from avitourism have yet to be demonstrated across multiple geographic locations, especially in rural settings in need of economic opportunity. To the best of our knowledge, only Biggs et al. (2011) have offered an appraisal of tangible benefits derived by local communities from avitourism. This contrasts to myriad studies that have assessed the economic potential by asking avitourists about travel, accommodation and food expenditures. Where benefits for human communities can be demonstrated, the flow on benefits for conservation may become more attainable and quantifiable.

Given that birders, birdwatching and birds within their natural environment are not mutually exclusive, integrated research, that combines social, economic and ecological methods can provide a more holistic view of this relationship. Further research is required to address how avitourism can move forward both as an industry and as a mechanism to enhance avian conservation. For this to occur, research should focus on under-researched regions, including; southern hemisphere countries such as Australia, New Zealand and South American states as well as those developing countries in need of strategies to enhance sustainable development. In developing nations, sustainable tourism is often pursued as a means to address the delivery of social, economic and environmental benefits (see Saarinen, Becker, Manwa, & Wilson, 2009; Spenceley, 2008). Avitourism in particular is one avenue that is gaining momentum (Biggs et al., 2011; Conradie et al., 2013; Simango, 2011), given that some regard it as being more sustainable than other forms of nature-based tourism (Li et al., 2013).

The development of a sustainable avitourism industry requires appropriate infrastructure for tourism activities, stability in socio-economic systems as well as intact avian habitats for travellers to observe birds in the wild. In terms of sites with potentially appealing bird assemblages, BirdLife International's global Important Bird Areas (IBAs) program provides an ideal base from which to select key birding locations. With only about 50% of all IBAs under formal protection for conservation globally, there are numerous opportunities for landowners to capitalise on the opportunity avitourism presents to fund conservation on private land (Hughes, 2005). Conservation on private land is becoming increasingly important (Figgis, Humann, & Looker, 2005; Gallo, Pasquini, Reyers, & Cowling, 2009; Pegas & Castley, 2014) as formal, public sector funded conservation areas struggle with budget cuts, changing national conservation policies, dwindling management capacity and increasing external threats (see Whitelaw, King, and Tolkach, 2014). Before we can identify those areas with promising avitourism opportunities, there needs to be an assessment of the current status of land use in IBAs but also more broadly to evaluate how these areas can meet avitourism demand driven by the desire to see particular bird species.

Collaboration between the natural and social science community is needed to examine the attitudes avitourists have towards birds, bird habitats and bird conservation. While Green and Jones (2010) and Puhakka et al. (2011) have addressed this to some extent, it requires a more detailed examination to assess specific bird groups and locations that appeal to avitourists (i.e. demand-driven research). Such action will not only direct where further opportunities lie for increasing avitourism, but also which sites may be vulnerable to the potential negative impacts of the industry. As noted previously, the potential for negative impacts has not been thoroughly examined, and merits further attention. Observation of the prevalence of potentially harmful activities needs quantitative documentation. Furthermore, an enhanced understanding of the knowledge avitourists have about avian conservation

strategies may also shed light on exactly how important this issue is to them, and what value they place on species and habitat conservation. This may become increasingly important as the sustainability of the avitourism industry is inextricably linked with the conservation of both bird communities and their natural habitats.

Limitations of this study

Our study provides the first quantitative review of avitourism research. We acknowledge that our ability to provide a fully comprehensive assessment was limited by the fact that only studies published in English were included in the study. However, given that most avitourists seem to originate in Anglophone countries (Connell, 2009), we are confident that most of the relevant studies have been captured here. Furthermore, studies from non-English speaking countries were included in the review, reflecting that while the industry is growing outside of these regions much of it is captured within the English literature (e.g. Li et al., 2013). A further limitation stems from the fact that avitourists are not always examined separately from general ecotourists. Therefore, there is potentially more information about avitourists within larger datasets that have been analysed as more general tourist cohorts. Due to the specific criteria that were applied here these other studies were excluded from the pool of possible data.

Conclusion

Despite birdwatching's long cultural history, avitourism research is a relatively new sub-discipline within the nature-based tourism literature. Due to the diverse approach to the field thus far, general patterns and trends are difficult to identify. Nevertheless, we were able to show that research has been dominated by the social sciences and assessments of birder

motivations, with the majority of these studies emanating from established birding destinations. Substantial knowledge gaps remain in relation to the importance of the birds themselves in the development of avitourism products. Furthermore, while the dependence of avitourism on avian conservation is undeniable, there is considerable uncertainty about whether the industry and avitourists would contribute to conservation efforts to ensure the sustainability of the industry. Ongoing research needs to embrace the connections between the birders, their activities and birds to demonstrate the underlying patterns of avitourism more generally. Avitourism has the potential to provide considerable benefits but the extent of these activities needs to be properly evaluated to assess their ability to deliver sustainable conservation and tourism development outcomes on both public and private lands.

References

- ABA (2003). American Birding Association. Principles of Birding Ethics. Last accessed April 15, 2014, from <http://www.aba.org/about/ethics.html>
- Bernardon, B. & Nassar, P.M. (2012). Birdwatching in the Mamiraua Lake as an appeal to ecotourists/birdwatchers. *UAKARI* 8 (2), 49-64.
- Biggs, D., Turpie, J., Fabricius, C. & Spenceley, A. (2011). The value of avitourism for conservation and job creation – An analysis from South Africa. *Conservation and Society* 9 (1), 80-90.
- BirdLife Australia (2012). Ethical Birding Guidelines. Last retrieved April 15, 2014, <http://www.birdlife.org.au/documents/POL-Ethical-Birding-Guidelines.pdf>
- BirdLife International (2013). Datazone Species Search. Last retrieved April 15, 2014, <http://www.birdlife.org/datazone/species/search>

437 Birds of India (2009). The ethic and science of bird call playback. Last retrieved April 15,
 438 2014, <http://www.kolkatabirds.com/callplayback.htm>

439 Bireline, H.R. (2005). *Recreation specialization and reports of potential impact behaviors*
 440 *among birders attending birding festivals*. (Unpublished master's thesis) University of
 441 Florida, Florida.

442 Bonta, M. (2010). Ornithophilia: Thoughts on geography in birding. *The Geographical*
 443 *Review* 100 (2), 139-151.

444 Booth, J.E., Gaston, K.J., Evans, K.L. & Arnsworth, P.R. (2011). The value of species rarity
 445 in biodiversity recreation: A birdwatching example. *Biological Conservation* 144, 2728-2732.

446 Bovarnickm A., Fernandez-Bacam J., Galindom J. & Negretm H. (2010). *Financial*
 447 *sustainability of protected areas in Latin America and the Caribbean: investment policy*
 448 *guideline*. United Nations Development Programme (UNDP) and The Nature Conservancy
 449 (TNC).

450 Buckley, R.C. (2004). *Environmental Impacts of Ecotourism*. Cambridge: CAB International.

451 Burger, J., Gochfeld, M. & Niles, L.J. (1995). Ecotourism and birds in coastal New Jersey:
 452 Contrasting responses of birds, tourists, and managers. *Environmental Conservation* 22 (1),
 453 56-65.

454 Burr, S.W. & Scott, D. (2004). Application of the recreational specialization framework to
 455 understanding visitors to the Great Salt Lake bird festival. *Event Management* 9 (1-2), 27-37.

456 Çakici, A.C. & Harman, S. (2007). Importance of destination attributes affecting destination
 457 choice of Turkish birdwatchers. *Journal of Commerce & Tourism Faculty* 1, 131-145.

458 Che, D. (2003). Guided birding tours: An examination of the market, important tour
 459 parameters, and participant demographics. In Murdy, J.J. (Ed.), *Proceedings of the 2003*
 460 *Northeastern Recreation Research Symposium* (pp 194-202). New York: USDA Forest
 461 Service.

462 Cole, J.S. & Scott, D. (1999). Segmenting participation in wildlife watching: A comparison
 463 of casual wildlife watchers and serious birders. *Human Dimensions of Wildlife* 4(4), 44-61.

464 Collins-Kreiner, N., Malkinson, D., Labinger, Z. & Shtainvarz, R. (2013). Are birders good
 465 for birds? Bird conservation through tourism management in the Hula Valley, Israel. *Tourism*
 466 *Management* 38, 31-42.

467 Connell, J. (2009). Birdwatching, twitching and tourism: towards an Australian perspective.
 468 *Australian Geographer* 40 (2), 203-217.

469 Conradie, N. & van Zyl, C. (2013). Agreement of the international avitourist market to
 470 ecotourism principles: A South African development perspective. *African Journal of*
 471 *Business Management* 7 (30), 3013-3021.

472 Conradie, N., van Zyl, C. & Strasheim, A. (2013). What inspires birders to migrate South
 473 towards Africa? A quantitative measure of international avitourist motivation. *Southern*
 474 *African Business Review* 17 (1), 128-167.

475 Cordell, H.K. & Herbert, N.G. (2002). The popularity of birding is still growing. *Birding* 34
 476 (1), 54-61.

477 Czajkowski, M., Giergiczny, M., Kronenberg, J. & Tryjanowski, P. (2014). The economic
 478 recreational value of a white stork nesting colony: A case of 'stork village' in Poland.
 479 *Tourism Management* 40, 352-360.

480 Dickie, I., Hughes, J. & Esteban, A. (2006). *Watched like never before...the local economic*
481 *benefits of spectacular bird species*. Beds: RSPB.

482 Dickinson, R. & Edmondson, B. (1996). Golden Wings. *American Demographics* 18 (12),
483 47-49.

484 Dooley, S. (2007). *Anoraks to zitting cisticola – a whole lot of stuff about birdwatching*.
485 Crows Nest: Allen & Unwin.

486 DTI (2010). Department of Trade and Industry. *Avitourism in South Africa. Research and*
487 *analysis report*. Pretoria: The DTI

488 Eagles, P.J.F. (2014) Research priorities in park tourism *Journal of Sustainable Tourism*, 22
489 (4), 528-549

490 Emerton, L., Bishop, J. & Thomas, L. (2006). *Sustainable financing of protected areas: a*
491 *global review of challenges and options*. Gland: IUCN.

492 Eubanks, T., Kerlinger, P. & Payne, R.H. (1993). High Island, Texas. Case Study in
493 Avitourism. *Birding* 25 (6), 415-420.

494 Eubanks Jr, T. & Stoll, J.R. (1999). *Avitourism in Texas. Two studies of birders in Texas and*
495 *their potential support for the proposed World Birding Center*. Austin: Fermata Inc.

496 Eubanks Jr, T.L., Stoll, J.R. & Ditton, R.B. (2004). Understanding the diversity of eight
497 birder sub-populations: Socio-demographic characteristics, motivations, expenditures and net
498 benefits. *Journal of Ecotourism* 3 (3), 151-172.

499 Figgis, P., Humann, D. & Looker, M. (2005). Conservation on private land in Australia.
500 *Parks* 15 (2), 19-29.

501 Gallagher, A.J. & Hammerschlag, N. (2011). Global shark currency: the distribution,
502 frequency, and economic value of shark ecotourism. *Current Issues in Tourism* 14, 797-812.

503 Gallo, J.A., Pasquini, L., Reyers, B. & Cowling, R.M. (2009). The role of private
504 conservation areas in biodiversity representation and target achievement within the Little
505 Karoo region, South Africa. *Biological Conservation* 142, 446-454.

506 Green, R. & Jones, D.N. (2010). *Practices, needs and attitudes of bird-watching tourists in*
507 *Australia*. CRC for Sustainable Tourism. Brisbane: Griffith University.

508 Gregory, R.D., Gibbons, D.W. & Donald, P.F. (2004). Bird census and survey techniques. In
509 Sutherland, W.J., Newton, I. & Green, R.E. (Eds.), *Bird Ecology and Conservation: a*
510 *Handbook of Techniques* (pp. 17-55). Cambridge: Cambridge University Press.

511 Guitart, D., Pickering, C. & Byrne, J. (2012). Past results and future directions in urban
512 community gardens research. *Urban Forestry & Urban Greening* 11 (4), 364-373.

513 Gurung, H. (2012). Nepal: A paradise for birdwatching. *Himalayas* 19, 20-23.

514 Hale, A.M. (2006). Group living in the Black-breasted Wood-quail and the use of playbacks
515 as a survey technique. *The Condor* 108 (1), 107-119.

516 Harwood, S. (2008, February 11–14). Planning and development of community based
517 tourism: Bird watching destinations. In S. Richardson, L. Fredline, A. Patiar, & M. Ternel
518 (Eds.), *Proceedings of the 18th Annual CAUTHE Conference (on Disc)*. Gold Coast, QLD:
519 Griffith University.

520 Hill, S.G., Cable, T.T. & Scott, D. (2010). Wildlife-based recreation as economic windfall: A
521 rhetorical analysis of public discourse on birding. *Applied Environmental Education and*
522 *Communication* 9 (4), 224-232.

523 Hodur, N.M., Leistritz, F.L. & Wolfe, K. (2004). *Characteristics and expenditures of*
 524 *participants in the Potholes and Prairie birding festival*. Department of Agribusiness and
 525 Applied Economics. Fargo: North Dakota State University.

526 Hottola, P. (2009). Coastal bird tourism in Namibia: Postcolonial resources and restraints. In
 527 Hottola, P. (Ed.), *Tourism strategies and local responses in Southern Africa* (pp. 105-126).
 528 Wallingford: CAB International.

529 Hughes, R. (2005). IBA Local Conservation Groups and Caretakers. Learning from Early
 530 Experience and Future Directions. Review of Global experience of IBA Local Conservation
 531 Groups. Last retrieved April 15, 2014,
 532 [https://www.yumpu.com/en/document/view/9612175/iba-local-conservation-groups-and-](https://www.yumpu.com/en/document/view/9612175/iba-local-conservation-groups-and-caretakers-birdlife-international)
 533 [caretakers-birdlife-international](https://www.yumpu.com/en/document/view/9612175/iba-local-conservation-groups-and-caretakers-birdlife-international)

534 Hvenegaard, G.T. (2002). Birder specialization differences in conservation involvement,
 535 demographics, and motivations. *Human Dimensions of Wildlife* 7 (1), 21-36.

536 Hvenegaard, G.T., Butler, J.R. & Krystofiak, D.K. (1989). Economic values of bird watching
 537 at Point Pelee National Park, Canada. *Wildlife Society Bulletin* 17 (4), 526-531.

538 Hvenegaard, G.T. & Dearden, P. (1998a). Ecotourism versus tourism in a Thai national park.
 539 *Annals of Tourism Research* 25, 700-720.

540 Hvenegaard, G.T. & Dearden, P. (1998b). Linking ecotourism and biodiversity conservation:
 541 A case study of Doi Inthanon National Park, Thailand. *Singapore Journal of Tropical*
 542 *Geography* 19 (2), 193-211.

543 Isaacs, J.C. & Chi, Y.N. (2005). *A travel-cost analysis of a birdwatching festival: The Grand*
 544 *Isle migratory bird celebration*. Baton Rouge: Louisiana Department of Wildlife and
 545 Fisheries.

546 Jackson, S. (2007). Attitudes towards the environment and ecotourism of stakeholders in the
 547 UK tourism industry with particular reference to ornithological tour operators. *Journal of*
 548 *Ecotourism* 6 (1), 34-66.

549 Jones, C.A., Plante, S. & Shackelford, C.E. (2008). *The Great Texas Birding Classic: A*
 550 *birdwatching tournament that protects and promotes critical Texas Gulf coast habitat* (pp.
 551 479–482). McAllen: Proceedings of the Fourth International Partners in Flight Conference:
 552 Tundra to Tropics.

553 Jones, D.N. (2011). An appetite for connection: Why we need to understand the effect and
 554 value of feeding wild birds. *Emu* 111(2) i-vii.

555 Jones, D.N. & Buckley, R. (2001). *Birdwatching Tourism in Australia*. Brisbane: CRC for
 556 Sustainable Tourism.

557 Jones, D.N. & Neelson, T. (2005). *Impacts of bird watching on communities and species:*
 558 *long-term and short-term responses in rainforest and eucalypt habitats*. Brisbane: CRC for
 559 Sustainable Tourism.

560 Jones, D.N. & Reynolds, S.J. (2008). Feeding birds in our towns and cities: A global research
 561 opportunity. *Journal of Avian Biology* 39 (3), 265-271.

562 Kerlinger, P. (1993). Birding economics and birder demographics studies as conservation
 563 tools. In Finch, D.M. & Stangel, P.W. (Eds.), *Status and management of neotropical*
 564 *migratory birds* (pp. 32-38). Washington: USDA Forest Service.

565 Kerlinger, P. & Brett, J. (1995). Hawk Mountain Sanctuary: A case study of birder visitation
 566 and birding economics. In R. Knight & K. Gutzwiller (Eds.), *Wildlife and Recreationists:*
 567 *Coexistence through Management and Research* (pp. 169–181). Washington, D.C.: Island
 568 Press.

569 Kim, A.K., Keuning, J., Rovertson, J. & Kleindorfer, S. (2010). Understanding the
570 birdwatching tourism market in Queensland, Australia. *Anatolia: An International Journal of*
571 *Tourism and Hospitality Research* 21 (2), 227-247.

572 Kim, C., Scott, D., Thigpen, J.F. & Kim, S-S. (1998). Economic impact of a birding festival.
573 *Festival Management & Event Tourism* 5 (1-2), 51-58.

574 Kyorutungye-Karemente, A. (2007). *A web-based tour guide information system for selection*
575 *of bird habitat location in avi-tourism* (Unpublished master's thesis). Makerere University,
576 Uganda.

577 La Rouche, G.P. (2001). *Birding in the United States: A demographic and economic analysis*.
578 Washington D.C.: US Fish & Wildlife Service.

579 Lawton, L.J. (2008, February 11–14). Are US-Based birding festivals a form of ecotourism?
580 In S. Richardson, L. Fredline, A. Patiar, & M. Ternel (Eds.), *Proceedings of the 18th Annual*
581 *CAUTHE Conference* (on Disc). Gold Coast, QLD: Griffith University.

582 Lawton, L.J. (2009). Birding festivals, sustainability and ecotourism: An ambiguous
583 relationship. *Journal of Travel Research* 48 (2), 259-267.

584 Lawton, L.J. & Weaver, D.B. (2010). Normative and innovative sustainable resource
585 management at birding festivals. *Tourism Management* 31, 527-536.

586 Lee, C-K., Lee, J-H., Mjelde, J.W., Scott, D., Kim, T-K. (2009). Assessing the economic
587 value of a public birdwatching interpretive service using a contingent valuation method.
588 *International Journal of Tourism Research* 11, 583-593.

589 Lee, C-K., Lee, J-H., Kim, T-K. & Mjelde, J.W. (2010). Preferences and willingness to pay
 590 for a bird-watching tour and interpretive services using a choice experiment. *Journal of*
 591 *Sustainable Tourism* 18 (5), 695-708.

592 Lee, J-H. & Scott, D. (2004). Measuring birding specialization: A confirmatory factor
 593 analysis. *Leisure Sciences* 26, 245-260.

594 Li, F., Zhu, Q. & Yang, Z. (2013). Birding tourism development in Sichuan, China. *Tourism*
 595 *Economics* 19 (2), 257-273.

596 Lindsay, M. (1998). *The Great Texas Coastal Birding Trail: A Tool for Avitourism* (pp. 261-
 597 262) USDA Forest Service Proceedings RMRS.

598 Lyons, K., Markwell, K. & Johnson, P. (2009). Recreation specialisation and destination
 599 image: A case study of birding tourists values and their perceptions of Papua New Guinea.
 600 Paper presented at the meeting BEST EN Think Tank IX, James Cook University Singapore.
 601 Last retrieved April 15, 2014,
 602 http://ertr.tamu.edu/files/2012/09/566_LyonsMarkwellJohnson.pdf

603 MacKinnon, B.H. (2004). *Manual for training bird guides in rural communities*. Mexico:
 604 Amigos de Sian Ka'an.

605 Maple, L.C., Eagles, P.F.J & Rolfe, H. (2010). Birdwatchers' specialisation characteristics
 606 and national park tourism planning. *Journal of Ecotourism* 9 (3), 219-238.

607 McFarlane, B.L. (1994). Specialization and motivations of birdwatchers. *Wildlife Society*
 608 *Bulletin* 22, 361-370.

609 McFarlane, B.L. & Boxall, P.C. (1996). Participation in wildlife conservation by
 610 birdwatchers. *Human Dimensions of Wildlife* 1(3), 1-14.

611 Measells, M. & Grado, S. (2007). *Economic Impacts of Two Birding Festivals in Mississippi*,
612 Publication no. F0341, Forest and Wildlife Research Center. Starkville: Mississippi State
613 University.

614 Morris, J. (2008). Sustainability of avian ecotourism. In G. N. Editor & I. H. Editor (Eds.), *An*
615 *International Forum on Sustainability* (pp 43-50). Budapest: Arisztotelész Publishing Co.

616 Moss, S. (2004). *A bird in the bush: A social history of birdwatching*. London: Aurum Press.

617 Newsome, D. (2005). Enhancing the avitourism potential of the Boondall Wetlands,
618 Queensland. In Western Australian Section, Sustainable Tourism Cooperative Research
619 Centre Industry Forum, 14 October, Perth, Western Australia.

620 Newsome, D., Dowling, R.K. & Dowling, S.A. (2005). *Wildlife Tourism*. Clevedon: Channel
621 View Publications.

622 O'Connor, S., Campbell, R., Cortez, H., & Knowles, T. (2009). *Whale Watching Worldwide:*
623 *tourism numbers, expenditures and expanding economic benefits. International Fund for*
624 *Animal Welfare*. Yarmouth: Economists at Large.

625 Orenstein, R., Wong, A., Abghani, N., Bakewell, D., Eaton, J., Teck, Y.S. & Li, Y.D. (2010).
626 Sarawak – a neglected birding destination in Malaysia. *BirdingASIA* 13, 30-41.

627 Pegas, F. de V. & Castley, J.G. (2014). Ecotourism as a conservation tool and its adoption by
628 private protected areas in Brazil, *Journal of Sustainable Tourism*, 22 (4) 604-625
629

630 Petticrew, M. & Roberts, H. (2006). *Systematic reviews in the social sciences: A practical*
631 *guide*. Oxford: Blackwell.

632 Pickering, C.M. & Ballantyne, M. (2013). Orchids: An example of charismatic megaflora
 633 tourism? In A. Holden, & Fennell, D. (Eds). *The Routledge Handbook of Tourism and the*
 634 *Environment*. (pp. 192-199) London: Routledge.

635 Pickering, C.M., Hill, W., Newsome, D. & Leung, Y-F. (2010). Comparing hiking, mountain
 636 biking and horse riding impacts on vegetation and soils in Australia and the United States of
 637 America. *Journal of Environmental Management* 91 (3), 551-562.

638 Puhakka, L., Salo, M. & Sääksjärvi, I.E. (2011). Bird diversity, birdwatching tourism and
 639 conservation in Peru: A geographic analysis. *PLOS ONE* 6, e26786.

640 PRB (2011). Population Reference Bureau. Density (people per sq. km.). Last accessed April
 641 15, 2014, <http://www.prb.org/DataFinder/Topic/Rankings.aspx?ind=30>

642 Rothman, A. (2008). *A case study of bird trail development in Central America* (pp. 508–
 643 511). McAllen: Proceedings of the Fourth International Partners in Flight Conference: Tundra
 644 to Tropics.

645 Roy, S., Byrne, J. & Pickering, C. (2012). A systematic quantitative review of urban tree
 646 benefits, costs, and assessment methods across cities in different climatic zones. *Urban*
 647 *Forestry & Urban Greening* 11 (4), 351-363.

648 Saarinen, J., Becker, F., Manwa, H. and Wilson, D. (2009). *Sustainable tourism in Southern*
 649 *Africa: local communities and natural resources in transition*. Bristol: Channel View
 650 Publications.

651 Sali, M.J.G. & Kuehn, D.M. (2007). Gender-based motivations of non-residential
 652 birdwatchers in New York State: A qualitative study. In R, Burns, & Robinson, K. (Eds),
 653 *Proceedings of the 2006 Northeastern Recreation Research Symposium 9–11 April* (pp.318-

654 325). New York: US Department of Agriculture, Forest Service, Northeastern Research
655 Station.

656 Sari, C. Oban, R. & Erdogan, A. (2011). Ornitho-Tourism and Antalya. The 2nd International
657 Geography Symposium GEOMED2010. *Procedia Social and Behavioral Sciences* 19, 165-
658 172.

659 Scott, D. & Thigpen, J. (2003). Understanding the birder as a tourist: Segmenting visitors to
660 the Texas Hummer/Bird Celebration. *Human Dimensions of Wildlife* 8, 199-218.

661 Scott, D., Ditton, R.B., Stoll, J.R. & Eubanks, Jr T.L. (2005). Measuring specialization
662 among birders: Utility of a self-classification measure. *Human Dimensions of Wildlife* 10, 53-
663 75.

664 Şekercioğlu, Ç. (2002). Impacts of birdwatching on human and avian communities.
665 *Environmental Conservation* 29 (3), 282-289.

666 Şekercioğlu, Ç.H. (2003) Conservation through commodification. *Birding* 35, 394-402.

667 Simango, S.S. (2011). *The evolution, structure and market for birding tourism in South*
668 *Africa*. (Unpublished master's thesis). University of the Witwatersrand, South Africa.

669 Son, N.L.H., Dung, L.T. & Van, N.T. (2011). Developing bird watching ecotourism
670 combined with education and natural conservation. *VNU Journal of Science, Earth Sciences*
671 27, 89-97.

672 Spenceley, A. (2008). *Responsible tourism: critical issues for conservation and development*.
673 London: Earthscan.

674 Steven, R., Pickering, C. & Castley, J. G. (2011). A review of the impacts of nature based
675 recreation on birds. *Journal of Environmental Management* 92 (10), 2287-2294.

676 Steven, R. & Castley, J. G. (2013). Tourism as a threat to critically endangered and
677 endangered birds: global patterns and trends in conservation hotspots. *Biodiversity and*
678 *Conservation* 22 (4), 1063-1082.

679 Steven, R., Castley, J.G. & Buckley, R. (2013). Tourism revenue as a conservation tool for
680 threatened birds in protected areas. *PLOS ONE* 8, e62598.

681 Stoll, J.R., Ditton, R.B. & Eubanks Jr, T.L. (2006). Platte River birding and the spring
682 migration: Humans, value, and unique ecological resources. *Human Dimensions of Wildlife*
683 11, 241-254.

684 Topelko, K.N. & Dearden, P. (2005). The shark watching industry and its potential
685 contribution to shark conservation. *Journal of Ecotourism* 4 (2), 108-128.

686 Trainor, C.R., Santana, F., Pinto, P., Xavier, A.F., Safford, R. & Grimmett, R. (2008). Birds,
687 birding and conservation in Timor Leste. *BirdingASIA* 9, 16-45.

688 Vas, K. (2012). *Birding Trail Development from a Tourism Planning Perspective*.
689 (Unpublished master's thesis). University of Waterloo, Canada.

690 Welford, M. & Barilla, A. (2013). Is neotropical conservation sold-short: Diminishing returns
691 for birding suggest ecolodges could encourage longer stays. *Journal for Nature*
692 *Conservation*, 21 (6), 401-405

693 Whitelaw, P.A., King, B.E.M. & Tolkach, D. (2014) Protected areas, conservation and
694 tourism – financing the sustainable dream *Journal of Sustainable Tourism*, 22 (4) 584-603

695 Wiedner, D. & Kerlinger, P. (1990). Economics of birding: A National survey of active
696 birders. *International Council for Bird Preservation* 44 (2), 209-213.

697 Wight, P. (2007). Ecotourism, CSR, and the fourth dimension of sustainability. In J. Higham
698 (Ed.), *Critical issues in ecotourism: understanding a complex tourism phenomenon* (pp. 214-
699 239). Oxford: Elsevier.

700 Wong, H. C. S. (2009). *Birdwatching Tourism and the Possibility of Developing Cross-*
701 *border Birdwatching in Hong Kong and China*. (Unpublished master's thesis). University of
702 Hong Kong, Hong Kong.

Table 1. Details of the 66 studies examining avitourists or the avitourism industry

Author/s	Geographic focus of study (hemisphere)	Publication outlet	Publication theme
Bernardon and Nassar (2012)	Brazil (S)	<i>UAKARI</i>	Natural Science
Biggs et al. (2011)	South Africa (S)	<i>Conservation and Society</i>	Conservation/Social
Bireline (2005)	United States (N)	Master of Science	Thesis
Booth, Gaston, Evans, and Arnsworth (2011)	United Kingdom (N)	<i>Biological Conservation</i>	Conservation
Burger, Gochfeld, and Niles, (1995)	United States (N)	<i>Environmental Conservation</i>	Natural Science/Conservation
Burr and Scott (2004)	United States (N)	<i>Event Management</i>	Tourism
Çakici and Harman (2007)	Turkey (N)	<i>Journal of Commerce and Tourism Education Faculty</i>	Tourism
Che (2003)	United States (N)	Proceedings of the 2003 Northeastern Recreation Research Symposium	Other
Collins-Kreiner, Malkinson, Labinger, and Shtainvarz (2013)	Israel (N)	<i>Tourism Management</i>	Tourism
Connell (2009)	Australia (S)	<i>Australian Geographer</i>	Geography
Conradie and van Zyl (2013)	South Africa (S)	<i>African Journal of Business Management</i>	Other
Conradie et al. (2013)	South Africa (S)	<i>Southern African Business Review</i>	Other
Czajkowski, Giergiczny, Kronenberg, and Tryjanowski (2014)	Poland (N)	<i>Tourism Management</i>	Tourism
Dickie et al. (2006)	United Kingdom (N)	RSPB	Ornithological
Dickinson and Edmondson (1996)	United States (N)	<i>American Demographics</i>	Social
DTI South Africa (2010)	South Africa (S)	DTI South Africa	Natural Resource Management
Eubanks and Stoll (1999)	United States (N)	Texas Parks and Wildlife Department	Natural Resource Management

Eubanks, Kerlinger, and Payne (1993)	United States (N)	<i>Birding</i>	Ornithological
Green and Jones (2010)	Australia (S)	Sustainable Tourism CRC	Tourism
Harwood (2008)	United Kingdom (N)	CAUTHE: 2008 Conference - Where the Bloody Hell Are We?	Tourism
Hill, Cable, and Scott (2010)	United States (N)	<i>Applied Environmental Education and Communication</i>	Social
Hodur et al. (2004)	United States (N)	North Dakota State University	Other
Hottola (2009)	Namibia (S)	Tourism Strategies and Local Responses in Southern Africa	Tourism
Hvenegaard (2002)	Thailand (N)	<i>Human Dimensions of Wildlife</i>	Social/Natural Resource Management
Hvenegaard and Dearden (1998a)	Thailand (N)	<i>Annals of Tourism Research</i>	Tourism
Hvenegaard and Dearden (1998b)	Thailand (N)	<i>Singapore Journal of Tropical Geography</i>	Geography
Hvenegaard et al. (1989)	Canada (N)	Wildlife Society Bulletin	Social
Isaacs and Chi (2005)	United States (N)	Louisiana Department of Wildlife and Fisheries	Natural Resource Management
Jackson (2007)	United Kingdom (N)	<i>Journal of Ecotourism</i>	Tourism
Jones and Buckley (2001)	Australia (S)	Sustainable Tourism CRC	Tourism
Jones and Nealson (2005)	Australia (S)	Sustainable Tourism CRC	Tourism
Jones, Plante, and Shackelford (2008)	United States (N)	Proceedings of the Fourth International Partners in Flight conference: Tundra to Tropics	Ornithological
Kerlinger (1993)	United States (N)	USDA Forest Service General Technical Report	Natural Resource Management
Kerlinger and Brett (1995)	United States (N)	Wildlife and Recreationists: Coexistence Through Management and Research	Natural Resource Management
Kim, Scott, Thigpen, and Kim (1998)	United States (N)	Festival Management and Event Tourism	Tourism
Kim et al. (2010)	Australia (S)	<i>Anatolia: An International Journal of Tourism and Hospitality Research</i>	Tourism
Kyoratungye-Karemente (2007)	Uganda (N)	Master of Computer Science	Thesis

La Rouche (2001)	United States (N)	US Fish and Wildlife Service	Management
Lawton (2008)	United States (N)	CAUTHE: 2008 Conference - Where the Bloody Hell Are We?	Tourism
Lawton (2009)	United States (N)	<i>Journal of Travel Research</i>	Tourism
Lawton and Weaver (2010)	United States (N)	<i>Tourism Management</i>	Tourism
Lee, Lee, Mjelde, Scott, and Kim (2009)	South Korea (N)	<i>International Journal of Tourism Research</i>	Tourism
Lee, Lee, Kim, and Mjelde (2010)	South Korea (N)	<i>Journal of Sustainable Tourism</i>	Tourism
Li et al. (2013)	China (N)	<i>Tourism Economics</i>	Tourism
Lindsay (1998)	United States (N)	USDA Forest Service Proceedings RMRS-P-16. 2000	Natural Resource Management
Lyons, Markwell, and Johnson (2009)	Papua New Guinea (S)	Best EN Think Tank IX Presentations and Papers	Other
Maple et al. (2010)	Canada (N)	<i>Journal of Ecotourism</i>	Tourism
Measells and Grado (2007)	United States (N)	Forest and Wildlife Research Center (Mississippi State University)	Natural Resource Management
Morris (2008)	Global	An international forum on sustainability	Other
Newsome (2005)	Australia (S)	Sustainable Tourism CRC	Tourism
Orenstein et al. (2010)	Malaysia (N)	<i>BirdingASIA</i>	Ornithological
Puhakka et al. (2011)	Peru (S)	<i>PLOS One</i>	Natural Science
Rothman (2008)	Costa Rica (N)	Proceedings of the Fourth International Partners in Flight conference: Tundra to Tropics	Ornithological
Sali and Kuehn (2007)	United States (N)	Proceedings of the 2006 Northeastern Recreation Research Symposium	Other
Sari, Oban, and Erdogan (2011)	Turkey (N)	Procedia Social and Behavioral Sciences - GEOMED2010	Geography
Scott and Thigpen (2003)	United States (N)	<i>Human Dimensions of Wildlife</i>	Social/Natural Resource Management
Şekercioğlu (2002)	Global	<i>Environmental Conservation</i>	Natural Science/Conservation
Şekercioğlu (2003)	Global	<i>Quarterly Review of Biology</i>	Natural Science

Simango (2011)	South Africa (S)	Master of Arts	Thesis
Son, Dung, and Van (2011)	Vietnam (N)	<i>VNU Journal of Science, Earth Sciences</i>	Natural Science
Stoll, Ditton, and Eubanks (2006)	United States (N)	<i>Human Dimensions of Wildlife</i>	Social/Natural Resource Management
Trainor et al. (2008)	Timor Leste (S)	<i>BirdingASIA</i>	Ornithological
Vas (2012)	Canada (N)	Master of Environmental Studies	Thesis
Welford and Barilla (2013)	Ecuador (S)	<i>Journal for Nature Conservation</i>	Conservation
Wiedner and Kerlinger (1990)	United States (N)	<i>American Birds</i>	Ornithological
Wong (2009)	China/Hong Kong (N)	Master of Science	Thesis

Table 2. Number of studies (1989-2014) examining birdwatching tourism

Categories	Number of studies
Key objectives of study	
Economic	21
Birder motivations	18
Conservation	15
Market understanding	12
Destination features (birds/biological)	10
Birder specialisation	9
Negative impacts	6
Birder demographics	6
PA management	5
Community development	5
Sustainability	5
No specific questions	3
Theme of publication	
Tourism	21
Natural resource management	10
Natural Science	8
Social	7
Ornithological	7
Other	7
Conservation	5
Thesis	5
Geography	3
Methodological Approach	
Survey - tourists	35
Survey - operator	13
Secondary data analysis	11
Biological	9
Literature review	8
Commentary	8
Avitourists/Operators asked questions about?	
Demographics	28
Questions about commitment to hobby	17
Trip expenditure	15
Importance of other activities	12
Accommodation/ food preferences	10
Education/interpretation services - importance	9
Info source	8
Membership/donations to conservation orgs	8
Gear expenditure	8
Bird diversity - importance	7
Attitude towards conservation	5

Specific bird species/types	5
Rare/endemics - importance	4
Sustainability practices	2
New species - importance	2
Potential negative impacts	2
Challenges to avitourism industry	
Biological /impacts	18
Access - Manmade infrastructure	14
Social /political	9
Access - natural environment	7
Access - land tenure issues	3

Table 3. Global distribution of extant avian species richness and endemism by region compared with the number of avitourism studies from each region.

Region	Richness [*]	Endemism [#]	No. of studies
South America	3281	488	3
Asia	3114	745	9
Africa	2316	305	7
Australasia	1326	570	8
Middle East	619	11	1
North America	1289	138	27
Central America	1167	14	1
Caribbean	785	87	0
Europe	542	13	3
Oceania	353	109	0

^{*} Richness refers to the number of extant bird species

[#] Endemism refers to the number of species found only within this region.

Source: BirdLife International (2013)