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Diversity

Ethical birding call playback and conservation

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Until recently, bird-watching essentials comprised 2 items—comfortable footwear and binoculars. Although field guides increased accessibility and popularity of birding, smartphones have revolutionized this pastime via birding applications that facilitate identification and play recorded calls to attract unseen birds into view. In the rush to adopt this technology, there has been little questioning of the consequences of using call playback, either for birds or birders. Although many have pondered this question and tales of excessive playback abound, few researchers have measured its effects on birds, suggesting the prevailing view of call playback as necessarily harmful is not evidence based. Using current practices of professional birding guides in Colombia as examples, we considered the motivations underlying use of call playback and identified 5 priorities for strategic research to inform ethical birding practices. We suggest judicious use of call playback can yield positive outcomes for conservation by minimizing disturbance, generating sustainable income for local communities, and increasing opportunities for the wider community to engage with nature.

Globally biodiversity loss is accelerating. Paradoxically, people of all demographics are increasingly wanting to experience' nature, and bird watching is an option offered by the tourism industry. The transition from hobby to a distinct niche of ecotourism has manifested in recent decades; numbers of birders in some countries have doubled (Collins-Kreiner et al. 2013). As with any nature-based tourism, there is great potential to foster a connection with the environment and wildlife (Connell 2009; Ardoin et al. 2016) and to balance potential benefits of coexistence and conflict with nature (Budowski 1976).

Call playback—playing a recording of a bird call to simulate a territorial incursion and elicit a response—has long been used by biologists to monitor marsh birds (Conway 2011), owls, and other furtive species. Despite concerns regarding habituation, territorial abandonment, and increased risk of predation *inter alia*, few empirical data are available to assess effects of call playback. Several researchers have quantified effects of caller identity on behavioral (neighbor vs. stranger [Budka & Osiejuk 2013]) and physiological responses (Deviche et al. 2014). Others have evaluated response times (Bogner & Balldassare 2002), male versus female reactions (Bard et al. 2002), and interspecific interactions (Gibbs & Melvin 1993), mostly using vocal behavior as the response variable (but see Bui et al. [2015] in which 60% of radiotracked California Ridgway's rails [*Rallus longirostris obsoletus*] demonstrated no difference in movements after playback surveys). In the only definitive study to evaluate how birders using playback can affect birds (Harris & Haskell 2013), no deleterious short or long-term effects were found. Birds initially responded vocally to call playback but quickly became habituated to the prerecorded vocalizations so that responses essentially ceased after 12 days and, in 1 case, a pair built a nest right next to a playback speaker. Except for behavioral studies examining conspecific recognition (e.g., Davis 1986; Deviche et al. 2014), we are unaware of any work estimating physiological responses to call playback, in contrast with the multiple studies on effects of approach distance and human disturbance more generally (Coetzee & Chown 2016). Likewise, no information is available on longer-term effects of call playback on individuals or populations, and there have been no community-scale comparisons of areas experiencing different frequencies of call playback. So, although some birding groups and conservation organizations have strict policies limiting the use of call playback (e.g., the Australian Wildlife Conservancy formally prohibits call playback in its reserves), these policies are best regarded as precautionary rather than evidence-based.

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Although little is known about the effects of call playback on birds, less is known about the attitudes, practices, and motivations of birders (Steven et al. 2015). During recent (July–August 2017) fieldwork in Colombia, D.M.W. and M.D.C. gained insight into current practices of professional birding guides in terms of how and why call playback is used and the benefits and disadvantages for observing birds. Over 3 weeks, we engaged the services of 8 professional birding guides, all of whom used call playback in a comparable manner. In areas where a particular species was heard or considered likely to occur, prerecorded vocalizations were broadcast. With few exceptions, these calls were accessed via the smartphone app All Birds Colombia (Sunbird Apps), which contains over 4,000 calls, including at least 1 call for all 1,889 species known to occur in Colombia, and played via a portable loudspeaker. Of the 588 species seen during fieldwork, call playback was attempted for 129 species. Of the 93 species that responded to call playback and were seen, 44 were observed subsequently without call playback. A further 36 species did not respond to call playback but were subsequently seen. So, just 49 species were seen only after call playback—less than 10% of the trip list.

Reflecting on our experience and discussions with our guides, 4 deductions emerged. First, call playback increases the number of species seen and dramatically decreases the time to first sighting. Unlike conventional surveys where weeks of effort may be required to generate reliable estimates of species richness in Neotropical rainforests (and most detections are from vocalizations [Watson 2010]), our guides indicated their clients rarely spend more than 3 days per location and direct observation is much more important than heard-only detections. Second, call playback is an essential tool to locate many species their clients want to see—a birding guide's livelihood is tied directly to their ability to consistently find furtive and range-restricted species on demand. With the growth of ecotourism and rising numbers of tourists traveling to developing countries to see birds (Steven et al. 2015), this demand fuels an increasingly important revenue stream for communities with few nonextractive economic opportunities. Third, views of birds responding to call playback were typically fleeting—birds often appeared agitated, rarely staying within view for more than a few seconds. For those species seen subsequently without call playback, we had longer looks, observed more behaviors, and learned more about their natural history. Fourth, guides take their clients to a small number of known sites—readily accessible, safe areas, where they can consistently find sought-after species. These locations often have specific accommodation tailored to birding, for example, feeders to attract birds (hummingbirds, tanagers, ant-pittas) and established partnerships with local communities (e.g., drivers, access to adjacent land, information on reliable locations). Deleterious effects of call playback would compromise future income opportunities, so birding guides and affiliated operators and providers represent direct beneficiaries of best-practice birding.

Rather than considering effects in terms of individual birds, this wider socioeconomic context needs to be incorporated explicitly when quantifying effects of call playback. Thus, although detrimental effects of call playback need to be measured, findings need to be reconciled with a realistic counterfactual—the combined direct and indirect consequences of not using call playback. Longer visits and more time spent walking off trails necessarily increase trampling effects and may disturb more species and ecological processes. Spending more time and covering more ground trying to encounter elusive species may provide better views and entail longer visits, but may also make these locations less popular for time-constrained ecotourists. Without call playback, those locations where highly sought-after species are seen sporadically will be visited less and local communities will receive proportionally less income from visitors, so diminishing the realized economic value of intact habitats. To contextualize effects on individuals, impacts should be considered in terms of the proportion of populations affected, high-visitation sites likely representing negligible areas and numbers of residents for all but the most range-restricted taxa.

Protected area management systems aim to reconcile competing uses of areas with high conservation value and recognize sacrificial areas as one strategy to balance visitor needs with environmental protection (Black & Crabtree 2007). We suggest that designating particular birding locations as call playback permitted or call playback prohibited would foster an improved understanding of the consequences of call playback. As well as facilitating comparisons, justifying this regulation provides valuable opportunities to educate the community about ethical birding and the intersection between recreation and animal welfare. For species with small population sizes or highly restricted distributions, limiting the use of call playback by birders is sensible until evidence estimating effects is available. Likewise, using call playback before searching preferred habitats is difficult to justify, especially because resultant views are typically shorter and reveal less about the species' behaviors. Although some current guidelines are reasonable (e.g., avoid call playback near nesting birds), not enough is known about how birds are affected by call playback or other forms of disturbance to advise on best-practice usage.

To clarify call playback effects on individual birds, several questions need to be addressed. What are the long-term effects of call playback on physiological stress, site fidelity, reproductive success, and juvenile recruitment and territorial establishment? Do birds use vocal discrimination to recognize and, with sufficient

exposure, ignore individual calls (such as those included in smartphone apps)?

At the broader scale, how does birding with and without call playback differ in terms of habitat disturbance? In areas visited by birders, what proportion of populations is affected by call playback? How much does birding with call playback contribute to local economies?

Experiencing nature is a prerequisite for valuing nature, and call playback is an interactive means to promote a wider and deeper understanding of species and their behaviors, an understanding that can foster a desire to protect them. Nature-based recreation necessarily involves disturbance (Budowski 1976)—minimizing those effects and maximizing the economic and conservation benefits of the experience are the basis of minimal-impact ecotourism (Ardoin et al. 2016). With the growing popularity of birding and the increasing prominence of wildlife-centered tourism, quantifying these trade-offs is a priority. The widely-held claim that call playback necessarily leads to habituation and, therefore, diminished efficacy for attracting species into view needs testing. In addition to measuring how call playback affects individual animals and their communities, such work will inform the design of next-generation birding apps and evidence-based guidelines for ethical birding. Birders already contribute valuable information on the distribution, movements, and behavior of species (Camacho 2016). By embracing ethical birding praxis, birders and birding guides will also deliver net positive outcomes and make lasting contributions to both animal welfare and biodiversity conservation.

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