

Viewpoint

Why ornithologists should embrace and contribute to Wikipedia

ALEXANDER L. BOND*

*Department of Biology, Memorial University of
Newfoundland, St. John's, Newfoundland and
Labrador, A1B 3X9, Canada*

The popular press has suggested that academics and researchers generally oppose the use of Wikipedia, the online, user-edited encyclopaedia, because of its inaccuracies and impermanence (Giles 2005, Waters 2007). However, there have been numerous evaluations of the accuracy, objectivity, completeness and quality of Wikipedia entries, which conclude that the quality of entries is comparable with other tertiary sources (Giles 2005, West & Williamson 2009). These studies concluded that Wikipedia should be treated as any other tertiary source in academia, and could be used as a 'first step', pointing towards appropriate references (e.g. Waters 2007). Although the attribution of sources in Wikipedia was weak in its early years, the number of citations to primary scientific literature has increased, and is actively encouraged (Nielsen 2007). Indeed, many academics now consider Wikipedia's entries to be credible and rely on it themselves (Bateman & Logan 2010, Dooley 2010). There are also some examples of integration between Wikipedia and academic sources, such as Gene Wiki (Huss *et al.* 2008), journals requiring authors to create or edit Wikipedia pages (Daub *et al.* 2008) and integration with GenBank.

The first search of a topic for many, scholars and public alike, is Wikipedia (Dooley 2010, Head & Eisenberg 2010) and Wikipedia is, by an order of magnitude, the first result in Google when searching by species names (Page 2010). As such, Wikipedia presents an excellent opportunity to communicate science to a general public (Moy *et al.* 2010). It is also an under-exploited opportunity to train students in synthesizing scientific information and presenting it to both a general and a specific audience, an oft-cited challenge of many academics (e.g. Frewer *et al.* 2003). Several successful outlines exist for undergraduate and graduate projects that create, edit and improve Wikipedia entries (Callis *et al.* 2009, Moy *et al.* 2010). Wikipedia therefore offers a unique outlet for science education, sci-

ence communication and public service – three tenets of higher education institutions and government agencies that are often given less than their due.

With regard to ornithology, the WikiProject Birds (http://en.wikipedia.org/wiki/Wikipedia:WikiProject_Birds) acts as a central clearing-house for topics relating to birds, birding and scientific ornithology. As with any specialist topic, coverage and quality of ornithological entries is often less than that of more general interest topics (Halavais & Lackaff 2008). Many species entries are poor or brief. Such 'stub' articles, short entries requiring expansion, would be a good starting point. At the end of March 2011, for example, there were 59 identified stub articles relating to the order Procellariiformes alone. Of these, 49 are species entries for relatively common, well-studied species (e.g. Common Diving-petrel *Pelecanoides urinatrix*). There were a total of 10 668 entries listed as stub-class articles concerning birds (http://en.wikipedia.org/wiki/Category:Stub-Class_bird_articles); this does not count articles that do not exist. In many cases, entries for genera and other higher-order taxonomic groupings are poor or incomplete. There is also poor coverage of BirdLife International's Important Bird Areas, information on ornithological journals and organizations (the entry for the American Ornithologists' Union on 27 March 2011 is lamentable at just over 100 words!). On 27 March 2011, entries were also lacking for other topics, such as dust-bathing, and for many notable ornithologists. Entries can be improved, and coverage expanded by those studying all aspects of ornithology, including its practice and history.

What can the ornithological community do to remedy this situation? I propose that the answer depends on one's position, organization and expertise. Professors can replace essays and reports assigned to students with the creation or improvement of a taxonomic Wikipedia entry. Such cooperative learning also increases student engagement by embracing 'hacker ethic values' such as the freedom to create within community-established guidelines, working with a tool to create open, accessible content, and a feeling of social worth by knowing that their work will benefit the wider community, among others (Arrbillaga 2008, Schroer & Hertel 2009). Active researchers can revise entries for their focal species, study sites, techniques (e.g. mist-netting) or concepts (e.g. life-history traits in birds). The entries for many tools used in ornithology but based in other fields (e.g. stable isotopes) have very little biological context or explanation. Those in ornithological societies or agencies can improve the article on their organization or publication(s). Above all, ornithologists should contribute to the degree they feel able – the nature of Wikipedia, where articles can be edited at any time by anyone, means that one need not necessarily write the definitive species account or treatise on a topic; others will add, edit and discuss. The time investment required is

*Email: abond@mun.ca

obviously a function of one's expertise in the subject area and the ease with which one learns and applies the simple Wikipedia mark-up style and conventions (starting on the WikiProjects Birds page is highly recommended for new users). I argue, though, that researchers should, above all, write and contribute content, leaving the finer details of formatting to those who are more comfortable and familiar with Wikipedia's conventions. Contributing to Wikipedia is also a meaningful way by which upper-level undergraduate and graduate students can contribute to a resource used by scientists and non-scientists alike, whereas student essays and reports languish in filing cabinets after the end of the term. By using expert and student resources, the quality, accuracy and completeness of Wikipedia entries will improve, making them a better resource for all users.

Wikipedia also offers two advantages to a learning environment – the Talk Page and the Watch List. Talk Pages exist for every article, and are a location for readers to discuss an article's content, address the appropriateness of including or excluding certain information, or decide if new articles should be split from existing ones. The Talk Page can therefore act as a discussion board for the article in question, and allow for refinement of an article's content. The Watch List informs registered users of edits made to articles. An instructor can add each student's assigned page to a Watch List to monitor progress and discussions on Talk Pages. It also can be used to monitor, identify and correct cases of article vandalism, where incorrect information (or in extreme cases, literal nonsense or off-topic content) is added to an article. Each article's revisions are kept and, like a back up, can be restored with little effort. Students (and academics) can also make use of the History Flow tool to follow a series of edits to an article. This documents changes to more controversial articles (e.g. revisions to classification), would allow an investigation of how the page has changed over time and would provide a discussion of the controversial topic at hand (Viégas *et al.* 2004, Vuong *et al.* 2008).

Regardless of the academy's views on Wikipedia, it will remain a resource used by students, researchers and the public for the near future. Academics should appropriate Wikipedia as a teaching and outreach tool, resulting in higher quality information, more engaged students and a better-informed public.

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