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The Considerations Given to Determining Authorship

Greetings GPNSS members! Over the past year, I have been asked by prospective authors and colleagues whether *The Prairie Naturalist* has criteria for authorship. Given that this issue continues to arise, it is comforting to know that I am not the only one who struggles with considerations given to determining authorship. I checked the current submission guidelines and found nothing specific, which in turn motivated me to explore what other journals such as the *Journal of Wildlife Management*, *Proceedings of the National Academy of Sciences*, and *Ecology* recommend to prospective authors (Merrill 2015). Much to my surprise, discussions of authorship have evolved beyond what I learned decades ago when first addressing the issue as a graduate student. I chose to dedicate this editorial to the issue of authorship by addressing allegations that deceptive authorship is ethical misconduct (Merrill 2015).

The number of multi-authored publications has steadily increased across disciplines in recent years (Cozzarelli 2004, Harrison 2006, Weltzin et al. 2006). For instance, when surveying the *Journal of Wildlife Management*, Powell et al. (2010) documented an increase in the mean number of authors from approximately 1 in 1937 to between 3 and 4 authors in 2007, which was attributed to a need for more specialization and interdisciplinary collaboration to address increasingly complex environmental problems (Katz and Martin 1997, Merrill 2015). Likewise, multi-authored publications also may enhance scientific merit, citation rates, and produce more impactful manuscripts (Harrison 2006, Jones et al. 2008, Merritt 2015). However, growing concerns over “hyper-authorship” (i.e., authorship that inappropriately increases the number of authors based on individual contributions) also has accompanied the increasing trend in multi-authored publications (Merrill 2015). Because peer-reviewed publications affect hiring, salaries, tenure, grant success rates, and prominence of researchers, the sensitivity to this issue is not surprising (Hirsch 2005). Nevertheless, including co-authors who provide limited contributions can devalue authorship and place additional pressure on researchers to seek co-authorship to maintain viable publication records (Rose et al. 2012, Merrill 2015).

As ecologists continue to address increasingly complex environmental issues, I ask then why does the issue of authorship seem so complex? Surely we can develop criteria to more effectively deal with the sensitivity and integrity of authorship, which (in my opinion) centers on addressing four major problems highlighted by Clement (2014). First, research projects require involvement by multiple people to make a wide range of contributions, from trivial to complex.

How then do we decide which contributions merit authorship? One approach has been to evaluate individual authors' contributions according to a standardized and accepted set of criteria (Merrill 2015), which range from meeting all or any previously established criteria. For instance, the International Committee of Medical Journal Editors' (ICMJE) guidelines require that all four of the following criteria be met for recognition as an author: 1) substantial role in development of study design, data acquisition/analysis/interpretation, 2) drafting or revising manuscripts for intellectual content, 3) final approval of drafts submitted for publication, and 4) agreement for accountability of all aspects of the work to ensure that questions related to accuracy and integrity of the work are appropriately investigated and resolved (Merrill 2015). Meeting all of these criteria may be too restrictive, thus efforts to modify existing ICMJE authorship criteria are ongoing (Clement 2014, Merrill 2015). In contrast, the Ecological Society of America submission guidelines recognize authorship when any of the following criteria are met: 1) conceived research question(s) or study design, 2) active participation in data collection, 3) data analysis and interpretation, or 4) writing the manuscript. Despite having access to such guidelines, assigning authorship remains difficult. For instance, is authorship warranted for collecting data that you were hired to do? If someone implements a change in statistical methods or contributes new considerations to study design that are critical to data interpretation and improving strength of inference, should they be included as a co-author? If researchers provide historical data that are essential for successfully completing a study, should they be included as authors?

Second, there is increasing concern over “gift” or “guest” authorship (Merrill 2015). Although the reasons for inclusion of co-authors are varied, they may include persons in positions of power, senior authors to improve the likelihood of acceptance, or because scientists may be part of a research team despite not actively participating in particular manuscripts (Brand 2012, Merrill 2015). Guest authorship often arises in situations that include abuse of junior collaborators (such as students) and when individuals not involved with design implementation or data collection prepares or edits a first draft to save the senior author time (Merrill 2015). Minimizing the likelihood of these practices is a primary motivation behind some journals placing restrictions on the number of contributing authors or explicit statements of authors' contributions (Merrill 2015).

Third, current authorship criteria make it difficult to interpret actual contributions to multi-authored papers, and

minimal guidance on the ordering of authors (Merrill 2015). Commonly the author contributing the most is listed first with subsequent authors listed according to authors' diminishing contributions (Merrill 2015). However, traditions vary across disciplines and may listing the senior author's name last (Rennie et al. 1997), alphabetizing author names (Loui 2006), or utilizing more quantitative approaches ranging from listing percentage of contribution to combining output of various self-assessment matrices that emphasize self-assessment for differently weighted criteria (Clement 2014, Merrill 2015). While perceptions among contributor vary and tend to overestimate self-contributions, the benefit in appropriating credit may be optimized by formalizing communication among authors (Weltzin et al. 2006, Dyck 2013, Merrill 2015).

Lastly, current publication procedures emphasize credit while ignoring authorship responsibilities (Merrill 2015). While it is easy to claim credit, are authors willing to own the problem after completion if misuse of methods, errors, or fraud is revealed? Historically, authors were expected to accept responsibility for the entirety of their scholarly works. In multidisciplinary projects involving specialized expertise, equipment, and analyses, not all authors may have comprehensive knowledge on all aspects of the manuscript (Merrill 2015). Likewise, designating an author to assume responsibility for all or a significant part of the work often falls on the "senior" author, though whether that is the first, last, or corresponding author remains uncertain (Merrill 2015). Despite the uncertainty, each author should be fully responsible for their work and criticize the work as a collaborative research team according to a reasonable standard of prudence (Gilson et al. 1997, Merrill 2015).

Although multi-authored collaborations are valuable, they are not perfect (Primack et al. 2014). As such, I offer several recommendations to address the ongoing debate over sensitivity and integrity of authorship. First, consult existing submission guidelines prior to assigning authorship and subsequent ordering of authors. Provide authorship guidelines to all junior collaborators who join your research lab (Merrill 2015). Second, communicate at the start of a research project the principles of authorship, which in turn should facilitate or spawn group discussion. When designating order of authorship, do so with the caveat that author contributions may change, necessitating re-evaluation over time (Merrill 2015). Third, maintain inclusiveness for everyone making substantial intellectual contributions to the work to avoid unintentionally excluding authors. Be sure to communicate clearly that individual co-authors should claim credit and accept responsibility of all aspects of the work following completion (Merrill 2015). Lastly, establish a need for co-authors to claim responsibility for individual contributions, and request that all authors review manuscript drafts and approve the final version (Merrill 2015). With certainty, co-authorship can be a sensitive issue that we face when

preparing manuscripts for publication. The heterogeneity in setting standard and establishing guidelines across cultures makes the issue more complex as we become increasingly multi-disciplinary (Merrill et al. 2015). Ultimately, it will be the responsibility of individual co-authors to address their roles in authorship, balancing a need to maintain an open mind to varying perspectives while maintaining professional ethics and integrity (Merrill 2015).

As with past issues of *TPN*, we have a well-rounded issue with papers representing several taxa, and addressing a number of management and conservation issues. Phillip Leonard and his colleagues provide an insightful evaluation of avian diversity and nest success across the southern Great Plains. Other studies examine effects of drought on pheasant physiology, a field technique for discriminating small mammals using morphological characteristics, range expansion of Virginia opossum, prairie chicken depredation, and Trumpeter swan nesting behaviors. This issue also features several book reviews, which were overseen by our Book Review Editor, Dr. Larry Igl.

In closing, if you have any questions, comments, or helpful suggestions for improving *TPN*, please feel free to contact me. After all, this is your journal, and I very much appreciate your thoughts about it. Until next time, I wish you all a Happy New Year!

—Christopher N. Jacques
Editor-in-Chief

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