

Original Article

Publication Rates of Presentations Given at Annual Conferences of The Wildlife Society, 1994–2006

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ABSTRACT Annual conferences of The Wildlife Society (TWS) are important venues to advance wildlife science research through the presentation of papers and posters. However, no longitudinal analysis has been conducted of publication rates of TWS conference presentations. We classified all conference presentations from 1994 to 2006 by publication status, publication outlet, lead author affiliation, and elapsed time between presentation and publication to analyze presentation and publication trends. Of the 6,279 presentations reviewed, 1,771 were published (28.2%), primarily in the *Journal of Wildlife Management* (22.9%) or the *Wildlife Society Bulletin* (15.2%). The average time between presentation and publication was 30.1 ± 0.6 months. Academics provided most of the presentations (52.6%), as well as publications (62.4%). We believe consideration of TWS annual conference presentation and publication metrics by TWS membership and conference organizers is warranted to ensure maximum stakeholder benefit. We discuss these implications of publication analysis and offer suggestions for increasing publication rates, if that becomes a goal of TWS. We encourage periodic investigation to quantify conference benefits and to better assess the efficacy of TWS conferences. © 2013 The Wildlife Society.

KEY WORDS annual conference, authorship, peer review, publication rate, publication trends, scientific presentation, The Wildlife Society.

Since 1937 The Wildlife Society (TWS) has been committed to a wildlife stewardship mission through science and education. One way TWS accomplishes this mission and serves the professional community is via its annual conference. Initiated in 1994, the conference provides an outlet for members of the wildlife community to advance wildlife science and education through the dissemination of research via posters, oral presentations, and symposia. Though this contribution seems straightforward, no formal analysis of the efficacy of TWS conferences is available (e.g., Fennewald 2005) and perceived and realized conference benefits are not always synchronous (Bredeson and Scribner 2000). Thus, a quantitative analysis of TWS conference trends is necessary to objectively assess conferences in terms of presentation and publication rates and

stakeholder participation. Numerous investigations have reviewed various demographics and uses of TWS publications (Slack and Silvy 1990, Conover and Conover 1995, Powell et al. 2010). Such studies have undoubtedly resulted in positive growth within TWS by providing an introspective review of the society and its research, and by using quantifiable results to suggest changes to improve TWS publications.

To promote additional positive growth within TWS we believed it would be useful to measure the proportion of scientific presentations given at annual conferences that are ultimately published in peer-reviewed journals, a standard practice for many biomedical conferences. Such analyses are intended to assess a component of conference value and isolate components that could be improved (Gorman and Oderda 1990, Walby et al. 2001, Bydder et al. 2004). Publication rates provide a useful means for assessing annual conferences for several reasons. First, in comparison to presentation abstracts, published manuscripts are widely accessible to the scientific community, may be included in meta-analyses for completion and accuracy, and include greater detail with cited references (Scherer et al. 1994, Byerly et al. 2000, Kiroff 2001). Second, publications have withstood the rigors of peer-review, thereby imparting a measure of the completeness of information presented at

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professional meetings. Third, by publishing results, researchers ensure that information is not lost nor are studies unnecessarily replicated (Gorman and Oderda 1990, Fennewald 2005, Smith et al. 2007). Fourth, given that many topics discussed at TWS meetings impart critical information for managers and policy makers, publication increases the effectiveness of TWS to impact wildlife policy and conservation. In addition to publication rates, we assessed the affiliation of presenting and publishing authors to provide TWS leadership and stakeholders with insight into how different professional sectors contribute to presentation and publication metrics, and to identify cohorts that might benefit from additional encouragement to publish their findings.

Specifically, our study objectives were to 1) determine the number of presentations given at TWS conferences that are published in peer-reviewed journals and rank-order publication outlets; 2) determine elapsed time between presentation and publication and trends across years; and 3) determine proportion of publications from different agencies, institutions, or individuals. We believe investigation of TWS conference presentations will enable TWS leadership and membership to evaluate several aspects of conference efficacy, provide baseline data for future analysis, and provide impetus to alter conference structure to maximize TWS stakeholder benefit.

METHODS

Search Engine Selection

To select the appropriate search engine for our analysis, we experimented with BioOne, CSA Illumina Biological Sciences, EBSCOhost Agricola, First Search Biodigest, Advanced Google Scholar, ISI Web of Science, JSTOR, and Wilson Web Bio/Ag Index, and became familiar with the search capabilities of each. From our initial list of search engines, we selected 3 databases as the most likely to locate published wildlife literature. We then performed a standardized search of 270 presentations, selected at random, to identify the appropriate search engine(s) for our investigation. We selected these presentations by consecutively numbering all presentations in conference proceedings and then used a random number generator to choose abstracts, with an equal distribution among years (1994–2006). For this and subsequent analysis, we included presentations from concurrent sessions and symposia, but excluded posters. We searched the databases by presentation title in conjunction with presentation author(s) and recorded the proportion of presentations determined to be published from each of the 3 search engines. For all subsequent analyses, we selected the search engine with the highest proportion of detected publications.

Search and Classification Procedure

To determine whether a presentation was published in our formal analysis we first searched for the exact title of the presentation, taken from conference programs, in the “Find articles with all of the words” Advanced Google Scholar search box and applied an “anywhere in article” setting for

word (i.e., title) occurrence. For a presentation to be classified as published we required the peer-reviewed article to share all of the following components with the conference presentation abstract: study area, target species or research topic, study objectives, response variables, study period, and at least one of the same authors from the presentation. We evaluated returned results, using only the presentation title as search criteria, and verified or discarded possible matches based on comparative abstract contents and authors with the returned publication. If results failed to match our search criteria, we then incorporated lead author into the search by adding the first initial and last name of the lead author in the “Return articles authored by” search box while retaining the title settings. Again, we reviewed results and potential matches were considered as described above. If searching by lead author did not result in a match, then we sequentially searched by each additional author until a match was found or the presentation was classified as unpublished. We conducted all searches in November and December 2009.

If a presentation was classified as published, we compared time of presentation with time of publication, using months as the unit of time. If a journal was published quarterly, we assigned the months of February, May, August, and November to the first, second, third, and fourth quarterly issues, respectively. Biannual journals were assigned the months of March and October to correspond with the first and second issues, respectively. If presentations were published the same month as presented we assigned an elapsed time value of 0. We censored records from time to publication analysis if we were unable to determine the time of publication.

To quantify the proportion of presentations and publications from different affiliations we classified authors as academic, federal government, state or provincial government, tribal, military, non-government, consultant and private industry, municipal, or individual. We assigned affiliations based on presentation and publication lead author. Federal government classification included the Department of the Interior and Department of Agriculture, while military classification included the Department of Defense. We classified Cooperative Fish and Wildlife Research Units within the federal government affiliation despite their ties to academic institutions. Tribal classification consisted of affiliations directly tied to Native American Nations. We designated the non-government affiliation as conservation and management organizations that were not-for-profit, while consultant and private industry represented for-profit organizations. We used the individual classification when no affiliation was listed in the conference program, assuming that the individual represented him or herself. We then calculated proportion of presentations and publications by professional affiliation.

If an author, or authors, presented multiple presentations about a similar topic in multiple years, we evaluated each presentation individually—this led to the possibility of a single article corresponding with multiple presentations, yet conformed to our study search criteria and objective of determining the quantity of publications that result from

presentations given at annual conferences. We excluded book chapters and popular articles from our analyses because they often do not meet criteria of being peer-reviewed. We also excluded proceedings from scientific meetings and articles published in languages other than English from our analyses. We recognized that some proceedings are peer-reviewed; however, determining which proceedings were and were not peer-reviewed was beyond the scope of our study.

Data Analysis

We analyzed publication trends across our study period by graphing rates of publication and creating a linear regression trend-line. We summed and reported the number of presentations published in each journal during our analysis period to document the diversity of journals in which TWS presentations were published, and we calculated the number of months between presentation and publication. We analyzed these data for temporal trends in publication using simple linear regression of mean time to publication (in months) and conference year. We treated publications that appeared before presentation and after presentation as 2 separate classes for time-to-publication analysis, yet both were included when calculating publication rates. We examined the relationship between annual conference attendance rates and total number of publications and presentations using linear regression and a multi-way ANOVA in Program R (version 2.14.0; Vienna, Austria) treating year and attendance as explanatory variables with an interaction term, and total number of publications or presentations as response variables. We also used the proportion of presentations published after conferences as time-to-event data for survival analyses, with publication as the event of interest, to model the number of presentations published in our study period. We censored any abstracts from our survival analysis that remained unpublished at time of the last meeting (13 years or 156 months) or were published prior to conference year. Additionally, we excluded publications in which a journal did not report publication date. We conducted our survival analyses using Program R, and plotted results as Kaplan–Meier curves with 95% CI limits. We used log-rank tests to examine the differences between survival curves for publication affiliation classes and among years. To ease interpretation we limited comparative survival analysis to the top 4 professional affiliations.

RESULTS

Search Engine Selection

We determined BioOne, Web of Knowledge, and Advanced Google Scholar were the 3 most suitable search engines for our analysis. In our initial search engine efficacy test, we found 87 of 270 articles in peer-reviewed publications. Four of 87 (4.6%) articles were found by all search engines. No articles were found only in Web of Knowledge, 3 articles were found only in BioOne, and 60 articles were found only in Advanced Google Scholar. Our search engine test also revealed that 13 articles were found in both BioOne and Advanced Google Scholar and 7 articles were found in Web of Knowledge and Advanced Google Scholar. Based on these

Table 1. Mean number of months between publication and presentations given at annual conferences of The Wildlife Society, 1994–2006, for articles published prior to presentation.

Conference year	<i>n</i>	Mean	SE	Range
1994	8	10	5.03	3–45
1995	9	30	13.82	1–132
1996	7	12	3.40	2–25
1997	26	24	4.64	1–100
1998	11	20	4.40	7–56
1999	18	16	4.13	1–77
2000	13	19	4.19	2–52
2001	12	18	4.51	1–52
2002	6	10	3.09	1–23
2003	14	12	3.75	3–49
2004	25	12	2.54	1–46
2005	23	16	4.18	1–96
2006	37	26	3.83	1–84

results, we concluded that Advanced Google Scholar was the best search engine for our publication searches.

Presentation–Publication Analysis

Of the 6,279 presentations given at TWS annual conferences between 1994 and 2006, 28.2% ($n = 1,771$) resulted in peer-reviewed publications. Publication rates were greatest for the 1997 conference and lowest for the 2002 conference (37.9% and 19.0%, respectively; Fig. 1). Both the number of presentations and publications increased over time; however, the number of publications did not increase at the same rate as the number of presentations (Fig. 1) and we found a slight downward trend in the proportion of published presentations overall (Fig. 2, $R^2 = 0.006$). We found a significant effect of year ($F = 21.263$, $P = 0.005$) and attendance ($F = 9.94$, $P = 0.015$) on total number of presentations given, with no significant interaction between year and attendance ($F = 1.268$, $P = 0.379$). We found no significant effect of either year ($F = 5.480$, $P = 0.066$) or attendance ($F = 2.846$, $P = 0.145$) on total number of publications, with no significant interaction between year and attendance ($F = 0.218$, $P = 0.880$).

The 1,771 published presentations occurred in 241 journals. The top 11 journals (top 10 with a tie for 11th place) in which publications appeared were: the *Journal of Wildlife Management* (JWM, 22.9% of articles, $n = 405$), the

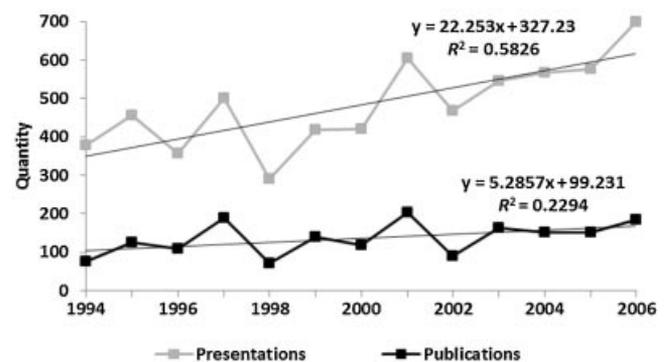


Figure 1. Number of presentations and resulting publications from annual conferences of The Wildlife Society, 1994–2006.

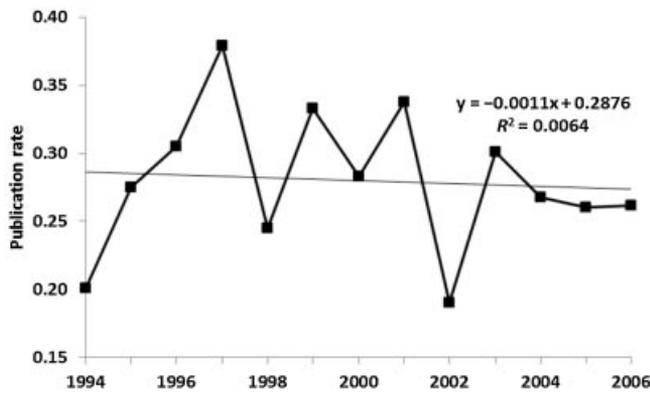


Figure 2. Proportion of presentations resulting in peer-reviewed journal articles from annual conferences of The Wildlife Society, 1994–2006.

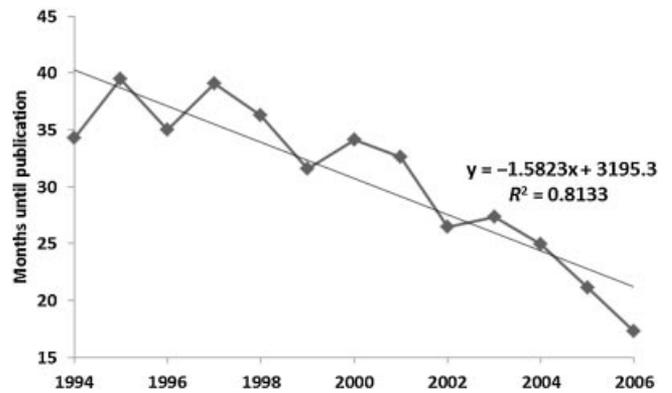


Figure 3. Average number of months after presentation at The Wildlife Society annual conferences, 1994–2006, to publication of presentations in a peer-reviewed journal.

Wildlife Society Bulletin (WSB, 15.2%, $n = 270$), the *Journal of Mammalogy* (3.3%, $n = 58$), the *Canadian Journal of Zoology* (2.8%, $n = 50$), *Ecological Applications* (2.8%, $n = 50$), *Conservation Biology* (2.5%, $n = 44$), *Condor* (2.3%, $n = 41$), *Biological Conservation* (2.1%, $n = 38$), *Forest Ecology and Management* (1.8%, $n = 32$), and the *American Midland Naturalist* and *The Auk* (1.8% each, $n = 31$).

We found that 1,722 of the 1,771 published articles had temporal information that allowed for analysis of elapsed time between presentation and publication. We determined 12.1% of presentations ($n = 209$; Table 1) were published prior to being presented at conferences and 87.9% of presentations ($n = 1,513$; Table 2) were published after being presented at conferences. We found that mean time between presentation and publication for articles published after conferences was 30.1 ± 0.6 months (mean \pm 95% CI) and presentations published prior to conference appeared in print 18.7 ± 1.4 months prior to the TWS conference. Average time to publication for post-conference publications displayed a significant negative relationship (i.e., presentations were being published more quickly) with conference year ($P < 0.001$; Fig. 3). No significant temporal trend ($P = 0.76$) was detected among abstracts published prior to presentation.

Table 2. Mean number of months between publication and presentations given at annual conferences of The Wildlife Society, 1994–2006, for articles published after presentation.

Conference year	n	Mean	SE	Range
1994	65	34	3.33	0–118
1995	110	39	3.14	0–144
1996	100	35	2.52	2–133
1997	150	39	2.46	1–140
1998	60	36	3.78	1–129
1999	121	32	2.00	0–102
2000	105	34	2.46	1–102
2001	187	33	1.69	0–97
2002	80	26	2.36	0–86
2003	141	27	1.44	0–74
2004	127	25	1.36	0–61
2005	127	21	1.13	0–48
2006	140	17	0.89	0–39

We excluded 258 published presentations from annual survival analysis because of unreported publication date by journals ($n = 49$) or because presentations were published prior to conference year ($n = 209$). Thus, we included 6,021 abstracts in our yearly survival analyses with 1,513 published manuscripts. Survival analyses for all years combined indicated 24.9% of abstracts were published by 144 months (Fig. 4) and publication rates differed by years ($\chi^2 = 60.7$, $df = 12$, $P < 0.001$). After censoring 244 presentations that lacked affiliation data or were published prior to conference year, we included 5,777 presentations in affiliation survival analysis. We found that 1,477 were published and available for use in comparing rates among affiliations. We determined that the 4 affiliations publishing most frequently were academic, followed by federal, state, and non-government organizations and log-rank tests indicated a difference between survival curves among the top 4 affiliations ($\chi^2 = 31.2$, $df = 3$, $P < 0.001$, Fig. 5).

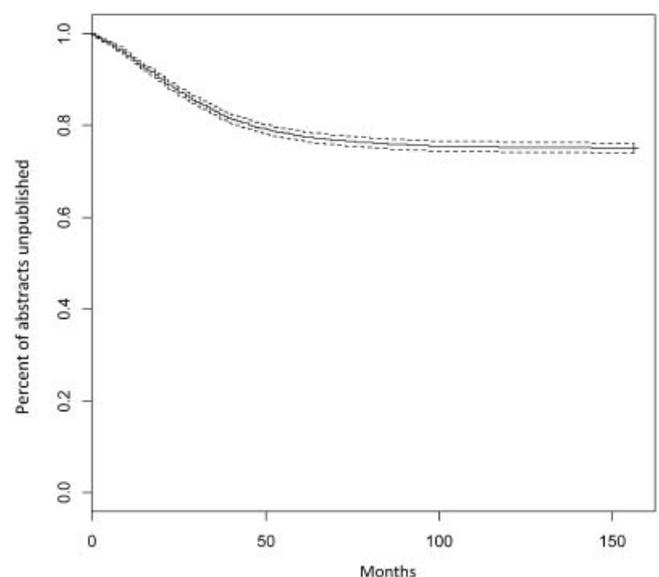


Figure 4. Kaplan–Meier curve for time to publication of 6,021 presentations given at The Wildlife Society's annual meetings, 1994–2006, with 95% confidence limits.

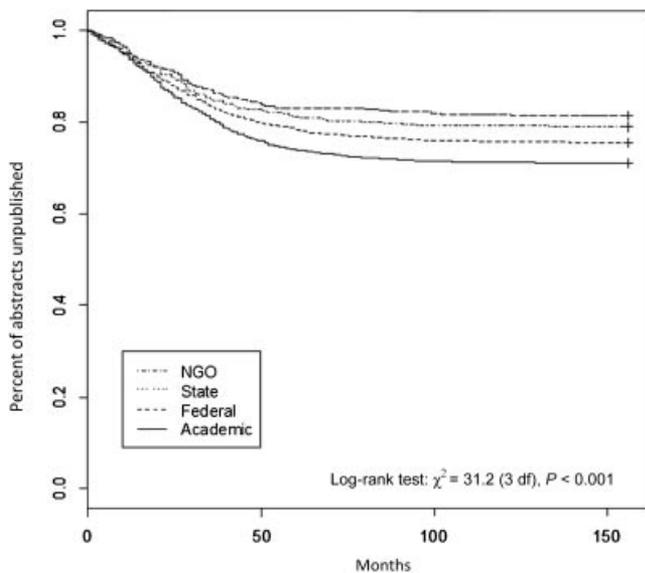


Figure 5. Kaplan–Meier curves for the time to publication of 5,777 presentations given by the top 4 affiliations at The Wildlife Society’s annual conferences, 1994–2006.

During our study period the academic sector gave the most presentations (52.6%; 95% CI = 49.8–55.4%), followed by federal government (25.1%; 23.5–26.7%), and state government (8.3%; 7.3–9.4%). Non-government organizations, tribal, municipal, industry and consulting, military, and private individuals gave a combined 14.0% of presentations. We also found that presentations were most commonly published in peer-reviewed journals by the academic sector (62.4%; 58.8–66.1%), followed by federal government (22.7%; 19.6–25.7%), and state government (6.5%; 4.8–8.2%). Collectively, 8.4% of publications came from tribal authorities, municipal, industry and consulting, non-government agencies, military, and private individuals.

DISCUSSION

A review of presentation fate is a standard component of biomedical science conferences (Bhargava 1996, Liu and Danziger 1996, Von Elm et al. 2003), yet to our knowledge ours is the first attempt to quantify publication parameters from TWS annual conferences. A marked difference between the biomedical field and the wildlife and conservation field that enables assessment of publication rates from conferences in the former field is a centralized search engine with which investigators can search for publication rates in biomedicine. The search engine, Medline, streamlines the search process and simplifies search replication. It may be wise for the wildlife profession to consider the formation of a similar search tool to encompass all wildlife-related journals. Such a search engine would maximize the transfer and utilization of wildlife research findings. Alternatively, Advanced Google Scholar may currently meet the needs of wildlife investigators. This search engine out-performed other scientific search engines for our analysis. A secondary reason we selected Advanced Google Scholar is that it is freely available to any internet user, facilitating future

replication of our study. As such, Advanced Google Scholar is more likely to reach a larger contingency of researchers, many of whom may lack access to subscription-based search engines.

We found that the 13-year mean publication rate of presentations given at annual conferences of TWS was 28.2%; a value incorporating publications published before and after conference presentation. Previous studies indicate peer-reviewed publication rates ranging from 21.6% (Corry 1990) to 69.1% (Roy et al. 2002) for national biomedical science conferences. A more applicable comparison comes from Bird and Bird (1999) which provides an assessment of publication rates from the 1989 and 1991 Biennial Conferences on the Biology of Marine Mammals, the only assessment of publication rates we encountered involving wildlife research. Bird and Bird (1999) reported that peer-reviewed publications resulted from 52.4% ($\pm 4.7\%$) and 51.2% ($\pm 4.6\%$) of conference presentations from 1989 and 1991, respectively. Furthermore, Liu and Danziger (1996) found a publication rate of 28.0% for abstracts from the 1992 meeting of the Federation of American Societies for Experimental Biology, a discipline that likely matches more closely to wildlife science than many medical conferences.

In general, the mean publication rate for TWS conferences is lower than rates reported in other studies and it is possible that the observed rate is the result of several search differences among studies. First, Bird and Bird (1999) conducted a key word search that would broaden search outcomes. However, we did not feel a key word search was acceptable for our analysis because key word selection is too subjective for replication. Our search procedure was stringent and we clearly defined rules to judge potential presentation and publication matches. Second, we used a binary classification of published or not published, which may have reduced the number of publications detected if a publication was similar to a presentation abstract, but did not completely adhere to our matching criteria. Third, in our initial search engine test, Advanced Google Scholar failed to locate 3 of 270 abstracts that were published, implying we likely failed to detect some abstracts that were, in fact, published. This could have occurred for a variety of reasons, including deviation from original abstract, publication in an obscure journal, change in author name (e.g., via marriage), or lack of digital access to the journal. Lastly, it is possible that the conference presentation provided a critical review that resulted in a more defensible, although different, publication. For the sake of consistency and repeatability, we created our search criteria based on the content of the abstract published in conference programs, limiting our ability to detect publications that differed from abstracts, even if the differences were the positive result of post-presentation feedback.

It is also possible our publication rates reflect real differences in publication rates between TWS conferences and other organizations. Potential explanations for this discrepancy include variable emphasis on the importance of publishing results, a more rigorous review process for peer-

reviewed publications than for presentation acceptance (Byerly et al. 2000), alternative motives for attending professional conferences beyond presenting research intended for publication (e.g., networking, workshops, career development), more rigorous selection criteria for presentations at biomedical conferences, and differing proportions of affiliation sectors—with varying emphasis on publishing—between TWS and biomedical conferences. Additionally, data presented at biomedical conferences often have direct ramifications for human health, and may be subjected to greater critique prior to acceptance, although concerns have been raised about this conjecture (Hopewell et al. 2006). The Wildlife Society conferences often include preliminary results from research in progress, symposiums, location-specific reports, and commentary on key topics or policy, all of which may or may not be intended for publication. In this capacity, TWS accepts presentations that are not necessarily publication-oriented, reflect some of the alternative motivations for attending conferences, and would result in lower publication rates.

We believe it is possible to raise the 28.2% rate of presentations that are published. Peer-reviewed publications establish a permanent record of findings and are available to a wider scientific audience than conference presentations. One way TWS could increase publication rates is to solicit post-conference surveys from presenters inquiring about the fate of presentations, which may encourage higher publication rates. Similarly, peer-reviewed journals could encourage and target presenters to publish their research after results are presented at conferences (Byerly et al. 2000). It might also be beneficial to restructure TWS annual conferences to incorporate fewer, but more complete studies, and to discourage the acceptance of vague, ambiguous abstract submissions to increase the publication rate of presentations, as well as improve the quality of information shared and discussed at conferences (Weintraub 1987, Herron and Falcone 1993, Anderson et al. 2003, Von Elm et al. 2003).

Our finding that the number of presentations increased through time and in relation to the number of attendees may imply that the number of presentations accepted for annual conferences is driven more by quantity of submissions, rather than quality of submissions. This finding is further supported by the fact that there was no significant effect of conference attendance or year on number of publications. Publication rates could also be increased by isolating the reasons for TWS presenters not publishing their research, and by doing so TWS organizers could begin to remove potential barriers to publication. Past studies have identified several additional reasons for presenters not publishing abstracts from biomedical conferences, including a lack of time or funding, lack of cooperation among co-authors, publishing the research was not a priority to the author(s), the study was still in progress, or the abstract was initially submitted and rejected by a journal and not re-submitted (Scherer et al. 1994, Sprague et al. 2003, Petticrew et al. 1999, Timmer et al. 2002, Sanossian et al. 2006). Similar studies also identified important determinants of successful publication of conference presentations such as presence of

analytical statistics, statistically significant results, larger sample size, university affiliation, international collaboration, a greater number of authors, and abstract acceptance (DeBellefeuille et al. 1992, Weber et al. 1998, Peng et al. 2006, Tambuscio et al. 2010, Galang et al. 2011). We propose similar analyses in the wildlife management field if increasing publication rates of TWS conference presentations is identified as a goal by stakeholders.

Our finding that *JWM* and *WSB* were the most common journals in which presentations were published is useful because it allows TWS to take an active role in promoting publication. Conference participants could be encouraged to publish in TWS journals in an automated e-mail system tied to conference presentation acceptance. The utilization of *WSB* by conference presenters also reinforces the decision of TWS to resume publication of this journal. Additionally, we documented that 241 journals published ≥ 1 presentation given at conferences, and the number of observed journals demonstrated that if publication is attempted and rejected, authors should search for another publication outlet to preserve the value of findings.

Our average time-to-publication of 30.1 ± 0.6 months is greater than those reported in other studies, primarily from various biomedical disciplines (e.g., 15.0 months in Marx et al. [1999], 15.8 months in Ciesla and Wojcik [2001], 16.5 months in Bydder et al. [2004], 20.5 months in Greenberg et al. [2008], and 10.0 months in Galang et al. [2011]). Fennewald (2005) reported a more comparable average publication time of 26 months from presented papers at the Association of College and Research Libraries National Conference. Smith et al. (2007) noted a median publication time of 27.8 months from presented abstracts at an annual American Urological Association meeting and found that abstracts were published sooner if the studies originated in the United States and included statistical hypothesis testing. Cheng et al. (1998) conducted a similar survival analysis for time-to-publication from 3 international cystic fibrosis conferences and they determined that 29% of the abstracts were published within 24 months, 40% within 60 months, and no significant factor affected time-to-publication, such as multiple authors or positive results. We also observed a shorter time-to-publication interval for manuscripts published after presentation in subsequent years of our analysis. This is likely the result of the conversion to electronic manuscript submission and review (Peng et al. 2006). As more journals convert to electronic format it seems likely that time-to-publication will decrease until an asymptote is reached.

It is possible that additional peer-reviewed manuscripts might be published from presentations given in the latter years of our study period. However, our search was conducted in 2009, approximately 36 months after the completion of the 2006 TWS annual conference, and our average time-to-publication is 30.1 months; therefore our estimates for 2005 and 2006 likely reflect realistic publication patterns for these 2 conferences.

Differences in publication rates observed among professional affiliations may be a product of differing job requirements

among affiliation sectors (Tambuscio et al. 2010) or may simply be representative of affiliation proportions across our 13-year study period. Most members of the academic affiliation are expected to publish findings in peer-reviewed literature (Drott 1995, Galang et al. 2011), while federal and state natural resource agencies often write internal reports, which can be presented at conferences. Collaborations between academics and state or federal entities are common in the wildlife field (Powell et al. 2010), with academics often responsible for publishing project results, and state or federal entities listed as secondary authors. Our analysis did not include affiliations of secondary authors; thus, we may have underestimated the actual role non-academics contribute to the publishing process.

Our finding that the academic sector published most aligns with results from studies examining publication rates from biomedical conferences: of abstracts presented at national pathology meetings, 94% had authors with academic affiliations and 98% of the resulting publications had authors with academic affiliations (Ciesla and Wojcik 2001). Additionally, over three-quarters of the presentation abstracts from the International Stroke Conference had a university affiliation and these abstracts were more likely to be published than abstracts without a university affiliation (64.7% and 54.8%, respectively; Sanossian et al. 2006). Tambuscio et al. (2010) attributed a lower publication rate of presented abstracts at a national forensic sciences meeting to fewer academic presenters, which does not appear to be the case in our study, where the majority of presenters had academic ties. Future analyses of TWS conferences may benefit by conference attendees identifying their professional affiliation during the conference registration process.

We hope TWS stakeholders—both conference attendees and the community at large—initiate discussions regarding the publication parameters we have presented to decide whether adjustments to the annual conference, and subsequent publication emphasis, are warranted. The Wildlife Society stakeholders would be well-served to quantify the expectations of conference attendees through surveys or other means and to better measure the success and overall impact of the conference on the wildlife profession. Requiring the survey be completed as part of the registration process may be an effective way to ensure surveys are returned and sample sizes are adequate for subsequent analyses; post-meeting surveys would also be useful, but subject to the non-response biases exhibited in self-selecting surveys (Vaske 2008). Ravn and Elsborg (2011), Chapman et al. (2007), Severt et al. (2007), Lee and Back (2007), and Spiegel (1999) offer potential frameworks for improving our understanding of what attendees expect from conferences and possible ways to deliver on those expectations.

Several questions arise from our findings that should be considered by TWS. If 28.2% of presentations given at TWS annual conferences are published, should a goal of the wildlife management and research community be to increase that publication rate so more permanent, peer-reviewed conclusions are readily available to the wildlife management community? If so, how can state and federal government,

private, not-for-profit, and tribal sectors remove their barriers to publication? Should the number of presentations accepted for conference presentation be reduced and scrutinized more closely if less than one-third of the presentations are published in peer-reviewed journals? Should an analysis of publication rates of presentations given at TWS annual conferences be conducted periodically to assess trends in publication rates? To answer these questions we recommend that they be asked of conference attendees during the registration process or of TWS members when annual dues are paid. Such a method would require little effort on behalf of TWS and would target the group of stakeholders from whom our data were generated.

Funding for wildlife research is often limited and we believe the availability of findings, however small, should be made readily available for perpetuity. Unfortunately, a scientific presentation often fails to serve as a lasting resource for information presented. For this reason, and to improve the quality of accessible scientific research through the peer-review process, an increased emphasis should be placed on peer-reviewed publication of research identified as relevant enough to be accepted for presentation at TWS annual conferences. We are not attempting to discredit the importance of scientific presentations or conferences with this recommendation, rather we hope to emphasize that reporting wildlife research does not end with a presentation and that investigators have a responsibility to see their data through the publication process in order to create a permanent and public record of their research. McGrail et al. (2006) identified 3 methods that could be used to increase publication rates, including writing courses, writing support groups, and writing coaches. We recommend all 3 be incorporated into annual TWS conference workshops or support groups. We also recommend that the writing coach role be clearly identified as a component of the TWS mentoring program. Furthermore, we suggest denying acceptance of conference abstracts without firm results and conclusions. Such a change would benefit all conference participants by exposing definitive conclusions and will likely increase the rate of presentations that are subsequently published. We realize that our suggestions will require TWS resources to implement; however, given that most presentations are published in TWS journals, it seems plausible that the revenue derived from page charges or journal subscriptions will offset expenses associated with member surveys or workshops. We hope that our results help refine methods of distributing wildlife science findings via TWS annual conferences and that these data will serve as a baseline for future investigations.

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