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Publication Trends in *The Canadian Field-Naturalist*, 1980–2015

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I examined publication trends for *The Canadian Field-Naturalist* (CFN) between 1980 and 2015 to determine whether a general decrease in natural history studies has been affecting CFN. I also establish a baseline of the types of authors that publish in CFN, and the types of studies that are typically published. Fewer but longer articles are being published every year. More authors per article with greater collaboration are publishing every year. The majority of authors are Canadian, but a large number of authors are from the USA. The majority of studies focus on vertebrates, and most of these focus on mammals, followed by birds, and then fish. Articles on basic biology are most common, although articles on conservation and species' geographic ranges are also common. CFN remains an important outlet for basic biology and conservation studies, and despite the decreasing trends in the number of articles published per year, CFN will likely remain a keystone publication for natural history in Canada.

Key Words: Meta-analysis; natural history; publication trends; temporal trends

Introduction

The Canadian Field-Naturalist (CFN) is an important outlet for peer-reviewed research on all aspects natural history (Mosquin 1970; Smith 1977; Callaghan 2011), from both professional and amateur authors (Mosquin 1970; Smith and Smith 1975; Smith 1979, 1980; Fitzsimmons and Skevington 2010). I specifically define natural history as observational, field-based studies of organisms. Natural history therefore includes many subdisciplines of biology, including ecology, behaviour, biogeography, taxonomy, and conservation. CFN (including its predecessors) has been published since 1880 (Cook 1986; Brunton 2004), and serves as a continuous record of natural history in Canada. This is very important, especially for the conservation of species (Bury 2006), where the best information for status reports on species comes from natural history papers.

Despite the importance of natural history (Bury 2006; Callaghan 2011), there has been some suggestion that studies on natural history are becoming less common (Peters 1980; McCallum and McCallum 2006). Some authors suggest that naturalists are not disappearing, but are rather studying the natural world in the lab rather than in the field (Arnold 2003), while other authors believe that natural scientists are focussing their effort on more efficient and marketable studies that can be published in journals with higher impact factors (Lopez 2001). Given that CFN often has the lowest or one of the lowest impact factors of any journal in both categories in which it is ranked (Thomson Reuters 2016), it seems likely that authors choosing to publish in CFN do not care much about the impact factor of CFN (Fitzsimmons and Skevington 2010), but are rather publishing in CFN because it is an important outlet for natural history observations. In fact, the impact factor might not accurately depict the actual impact of CFN, because impact factors generally under-value field research (Taylor 1981), and CFN is also commonly cited in books, monographs, and reports, which are not counted towards the impact factor (W.D.H., personal observation). The current generation might even have less natural history knowledge and fewer natural history skills than previous generations (Stebbins and Cohen 1995; Bury 2006) that may have important implications for the future of natural history publications. It is also possible that researchers and amateur naturalists are sharing their natural history observations through other media, especially with increasing online communication in recent years. Authors might also be publishing their natural history observations in region-specific journals, such as *Northeastern Naturalist* or *Northwestern Naturalist*, or taxa-specific journals, such as *Journal of Mammalogy* or *Journal of Herpetology*, to reach their target audience.

Given the importance of natural history, and the general loss of natural history publications and knowledge, I examine publication trends for CFN between 1980 and 2015 to determine if the general reduction in natural history studies is affecting CFN. I also examine what types of articles are being published, and information about the types of authors that are publishing in CFN. I establish how CFN has aided in the record of natural history studies, and forecast CFN's role in the future.

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Methods

I first collected page length for every volume of CFN published between 1920 and 2015 to put this study into historical perspective. I then collected metadata from every research article and note (henceforth referred to as articles) published in CFN between 1980 and 2015. Every CFN article from 2003 (volume 117 issue 2) and onwards is fully indexed and available online through the CFN website (http://www.canadianfieldnaturalist.ca). All articles from 1920 to 2010 are freely available from the Biodiversity Heritage Library (http://www.biodiversitylibrary.org/bibliography/39970#/summary). It should be mentioned that CFN also publishes book reviews, editorials, editor reports, annual reports and financial statements from the Ottawa Field-Naturalists' Club, and a news and comment section, all of which are highly valuable contributions, but are not directly related to the trends that I am exploring for this study. For this reason, I do not deal with any trends related to these other publications.

I specifically collected metadata on the number of pages for each article, the number of authors, location, and affiliation, the number of different first affiliations (some authors had multiple affiliations) for all authors, and the number of different locations for all authors. I also recorded which taxa were studied, and the general topic of the study. I first subdivided taxa into vertebrates, invertebrates, plants, and other, and then subdivided vertebrates into classes (amphibians, birds, fish, mammals, and reptiles). I subdivided topics into six large categories: basic biology (behaviour, ecology, etc.), conservation (status reports and studies with direct conservation application), distribution (range extensions), methods, taxonomy, and reviews.

I analyzed all data in R version 3.2.1 using simple linear regression (package: stats; function: lm; R Core Team 2015). In all analyses, I regressed each variable by year to examine if publishing trends have changed through time. I included a polynomial effect of year when the relationship was not linear. In analyses of categorical variables (i.e., author location, taxa), I included the total number of articles published in one year for each level of the category as the dependent variable, and included year, the categorical variable, and their interaction as independent variables.

Results and Discussion

Volume length, number of articles published, and article length

The Canadian Field-Naturalist published relatively short volumes between 1920 and 1969 (mean ± SE = 258 ± 7 pp), but due to an editorial decision (Mosquin 1970) began publishing much longer volumes from 1970 and onwards (583 ± 19 pp; Figure 1A). Although the volume length clearly increased between 1920 and 2015 (solid line on Figure 1A), volume length was relatively stable between 1920 and 1969, and between 1970 and 2015 (dashed lines on Figure 1A), although there was significantly more variance in volume length between 1970 and 2015. These trends in volume length demonstrate the important impact of editorial decisions in publishing trends, and also serve as a reminder that past decisions will have an impact on all trends that I focus on for the remainder of this study.

The Canadian Field-Naturalist peaked in the number of articles published in 1988 with 126; the number of articles published generally decreased through time by 1.6 / year (line of best fit: y = 3284.5 − 1.6 x; 95% CI_{slope} = −2.11 to −1.10; Figure 1B), with 56 fewer articles being published per year in 2015 than in 1980. This trend was best described by a polynomial equation (r^2_{adj} = 0.66), where the number of articles increased from 1980 to 1988, and then generally decreased from 1988 to 2015. The average length of articles increased through time at a rate of 0.05 more pages per article every year (line of best fit: y = −98.68 + 0.05 x; 95% CI_{slope} = 0.02 to 0.08; Figure 1C; r^2 = 0.28); articles in 2015 had 2.5 more pages than those in 1980.

The trend in the number of articles published is partly caused by conservation status reports by the Fish and Marine Mammal Subcommittee of the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) that were published in one issue per year from 1984 to 1993, 1996 to 1998, and in two issues in 2002. Indeed, the years with the highest number of articles published were also years with abbreviated COSEWIC status reports. These status reports were often published in addition to the regular number of articles in an issue. When COSEWIC decided to post full status reports on the internet (www.sararegistry.gc.ca), it relieved the CFN from any further role (F. Cook, personal communication), and the influx of extra articles was at an end. CFN has also had four special issues that each consisted of one article with much longer page lengths than normal that biased the average page length and number of articles during those years: in 1995 (66 pp; Pringle 1995), 1996 (254 pp; Cranmer-Bying 1996), 1997 (185 pp; Reddoch and Reddoch 1997), and 1999 (183 pp; Burnett 1999).

The number of articles published per year from 2010 to 2015 was still smaller than those published in the early 1980s by nearly 50 articles per year; therefore, there has still been a decreasing trend in the number of articles published when COSEWIC years are ignored. CFN faced a backlog of articles between 2005 and 2010 that lead to a lag in publication time and a subsequent sharp decrease in the number of articles published per volume (Figure 1A); volume length decreased from 649 pp in 2005 to 401 pp in 2008. This trend averaged around 410 pp per volume between 2008 and 2015, with small dips and increases around that trend. Even though CFN is currently publishing fewer articles than it did between 1980 and 2005, it is still publishing more articles and more pages per volume than before the editorial decision was made to increase volume length in 1970 (Mosquin 1970).

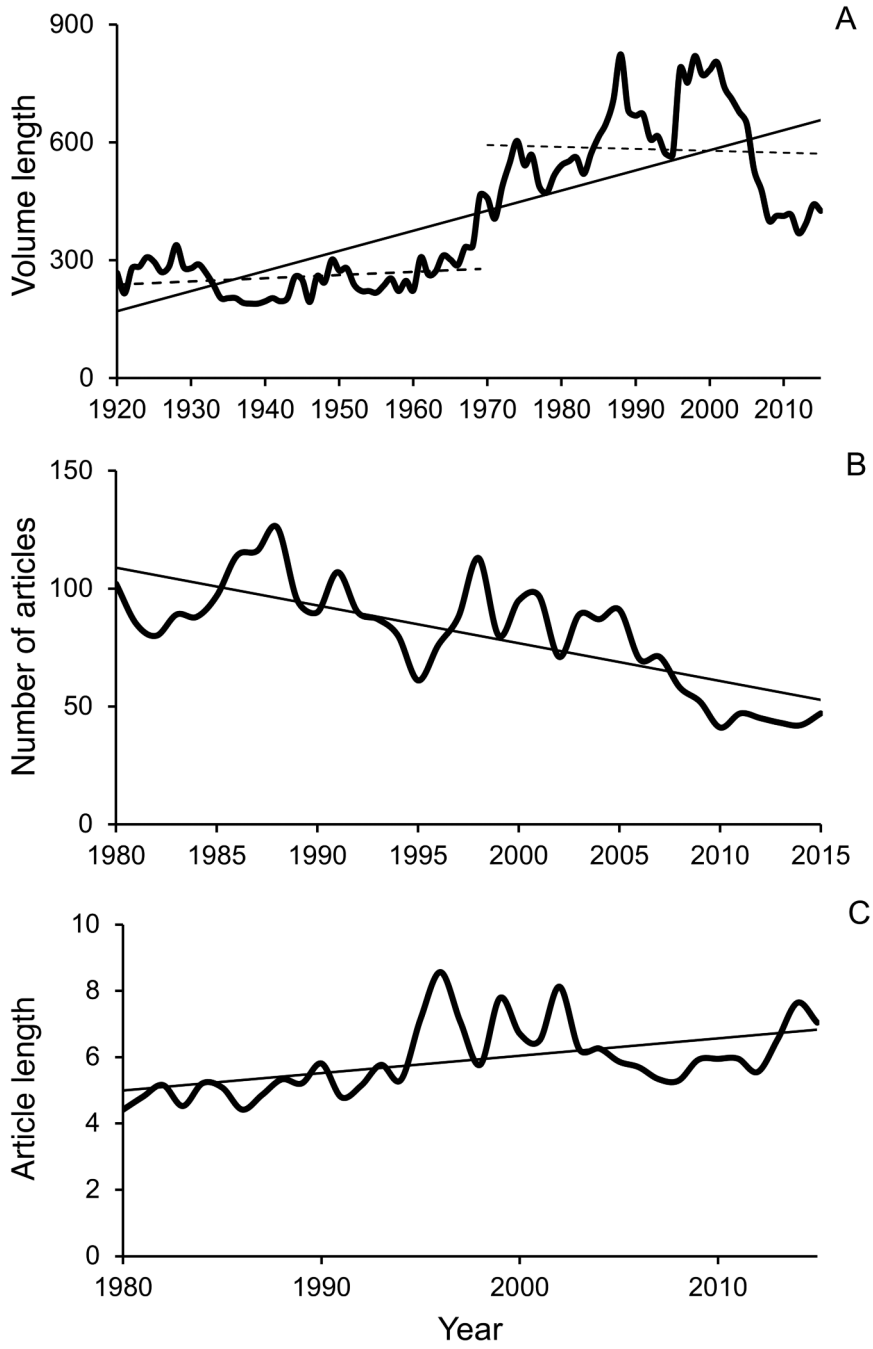

FIGURE 1. Volume length of *The Canadian Field-Naturalist* between 1920 and 2015 (A), and the number of articles published (B), and average article length (C) for all articles published in *The Canadian Field-Naturalist* between 1980 and 2015. Solid lines represent the line of best fit for the trend over the entire time period, and dashed lines in (A) represent trends over subsets of the time period.

In herpetology journals (*Herpetologica* and *Journal of Herpetology*), the number of natural history articles published per year has been decreasing, even though the total number of articles per year has been stable or increasing (McCallum and McCallum 2006). Many possible factors could have caused this change, including shifts in these types of publication to more regional journals, or that people are simply publishing their natural history observations less and focussing more energy and resources on experimental studies (Lopez 2001). Natural history observations may also be getting incorporated into larger publications that are then published in journals with higher impact factors. Because the number of articles published in CFN has been decreasing through time, it seems unlikely that natural history studies that were previously published in broader journals (such as the herpetology journals) are being published in CFN. Rather, it seems likely that the same factors causing fewer natural history articles in other journals are similarly affecting CFN. Despite the decreasing trend in the number of articles published, individual articles have been getting longer through time. It is possible that authors are publishing more data per article, are grouping multiple natural history observations together into one article, or are including more complicated analyses and models than in earlier years.

It is also possible that the decreasing trend in the number of articles being published in CFN is being caused by editorial decisions, including ability to handle workload and funding available to publish a certain number of pages per volume. Special issues and COSEWIC status reports, both of which increased the number of articles published and volume page length in the earlier years, each likely came with extra funding to cover publication costs. At this time, it is impossible to say what is causing this trend. Future work could examine the number of submissions to CFN, along with editorial decisions (rejection and acceptance rates), to determine whether authors are submitting fewer articles to CFN, and if this is the mechanism causing fewer articles to be published through time.

Taxa

The majority of articles published in CFN focussed on vertebrates, with a much smaller number of articles focussing on invertebrates and plants; only one article studied protists, eight articles studied fungi, 26 articles discussed entire ecosystems, and 49 articles were not related to living things over the 36 year span of this review. Articles on vertebrates decreased by 0.7 articles per year, whereas the number of articles on invertebrates and plants did not change as time progressed (Figure 2A; $r^2_{adj} = 0.85$).

Within vertebrate taxa, the most articles were published on mammals, followed by birds and then fish; a small number of articles were published on amphibians and reptiles. The number of articles published on birds decreased the most with time, at a rate of 0.5 articles per year (Figure 2B; $r^2_{adj} = 0.86$). The number of articles published on mammals decreased by 0.37 articles per year, and the number of articles on fish decreased by 0.32 articles per year. The number of articles published on amphibians and reptiles did not change with time. Although there were 10× more articles on fish than amphibians and reptiles from 1980 to 1990, the number of articles on fish has been very similar to the number of articles on amphibians and reptiles from 2005 onwards. The number of articles on herptiles (amphibians and reptiles combined) are published at similar rates to studies on plants and invertebrates.

The Canadian Field-Naturalist is clearly a popular outlet for natural history observations focussed on vertebrate animals. Most of the mammals that are studied are large and easy to observe, and birds are equally easy to observe (if not easier) for natural history observations. Secretive species, such as amphibians, reptiles, and invertebrates, are reported upon much less. Fish observations are often related to conservation or distribution (as in the earlier-mentioned COSEWIC reports), so despite the increased effort required to observe fish, there has been greater incentive to publish articles on fish due to the COSEWIC reports.

Topic

Many articles focussed on the general biology of a species, such as behaviour, foraging and diet, the relationship between the organism and its environment, population dynamics, and interactions between species. Other articles focussed on the geographic range (distribution) and conservation of species. A small number of articles focussed on different methods for studying organisms, the taxonomy of organisms, and reviews, but these types of articles were uncommon. The number of articles focussing on conservation, methods, review, and taxonomy decreased by 0.18 articles per year, the number of articles on species' distribution decreased by 0.54 articles per year, and the number of articles on basic biology decreased by 0.78 articles per year (Figure 2C; $r^2_{adj} = 0.89$). CFN remains first and foremost an outlet for field observations of the biology of organisms, but is also commonly an outlet for conservation articles (COSEWIC reports) and notes on range expansion. The decreasing trend in conservation studies might simply be due to COSEWIC reports being published in CFN during the earlier years, but not in the later years: when peak years are ignored on Figure 2C, the trend in number of conservation articles published is relatively low and stable through the study period.

Number of authors, number of affiliations, and number of locations

The number of authors per article has increased by 0.027 per year (line of best fit: $y = -51.0 + 0.026\,x$; 95% $CI_{slope} = 0.021$ to 0.031; Figure 3A; $r^2 = 0.79$). There were two authors per article, on average, in 1980 and three authors per article in 2015. The number of first affiliations of authors has increased by 0.017 per

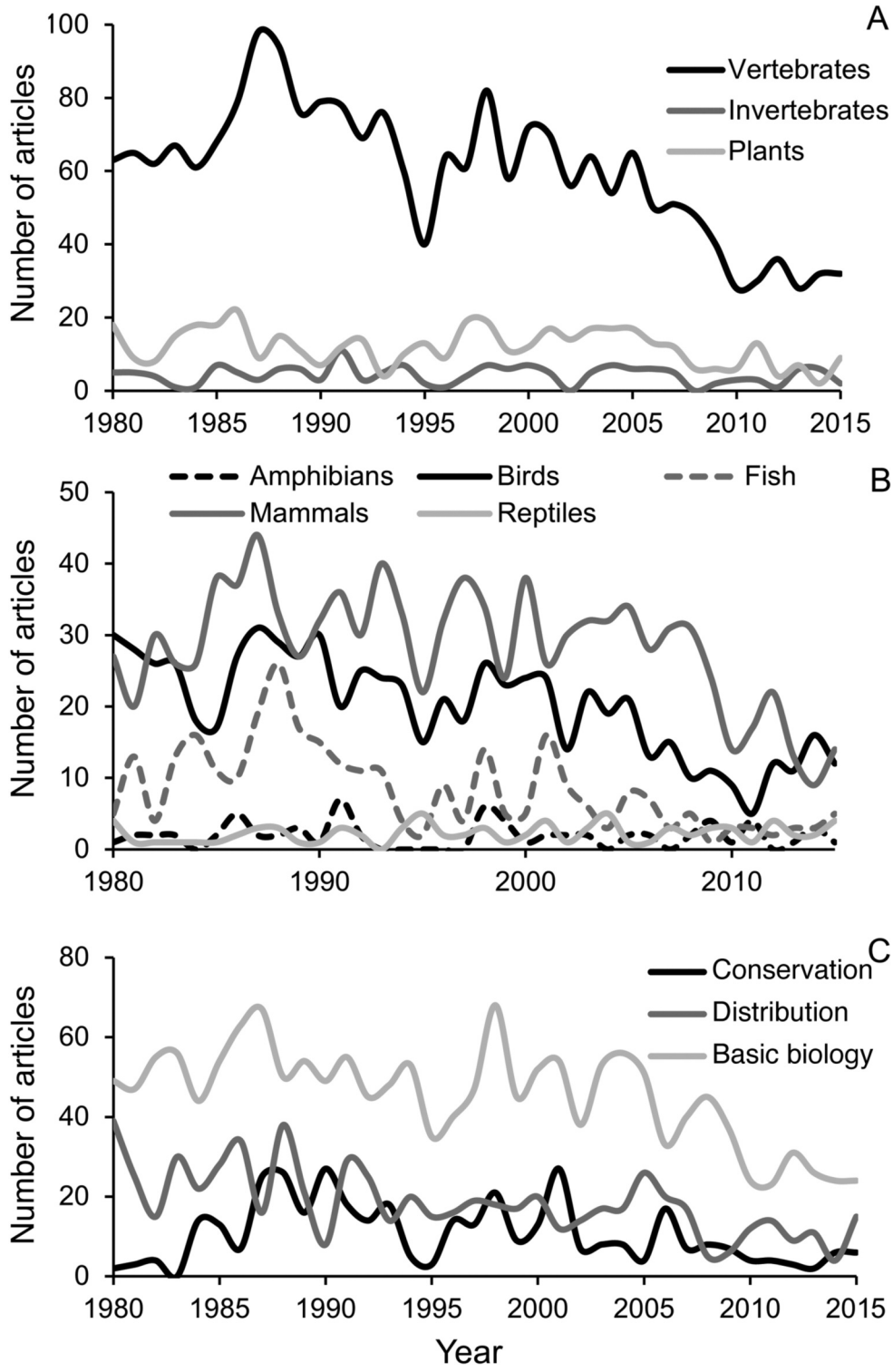

FIGURE 2. Number of articles published in *The Canadian-Field Naturalist* between 1980 and 2015 that focussed on major taxa (A), specific vertebrate taxa (B), and on different topics (C).

year (line of best fit: y = −31.4 + 0.017 x; 95% CI_{slope} = 0.012 to 0.021; Figure 3B; r^2 = 0.67), or 0.7 more affiliations in 2015 (two affiliations) than in 1980 (1.3 affiliations). The number of locations for authors has increased by 0.012 per year (line of best fit: y = −22.6 + 0.012 x; 95% CI_{slope} = 0.008 to 0.016; Figure 3C; r^2 = 0.56), which amounts to 0.35 more locations in 2015 than in 1980.

Wuchty *et al.* (2007) suggested that articles with the highest quality and highest impact are published by teams of people rather than by solo individuals because articles by teams are cited more than articles by solo authors. Wuchty *et al.* (2007) found that the number of authors per article in science and engineering has increased from 1.9 to 3.5 between 1955 and 2000. This equates to an increase of 0.036 more authors per article every year, which is very similar to the trend seen in CFN (0.027 more authors/article/year). It is therefore likely that the same factors that are causing the increased number of authors per article in the general

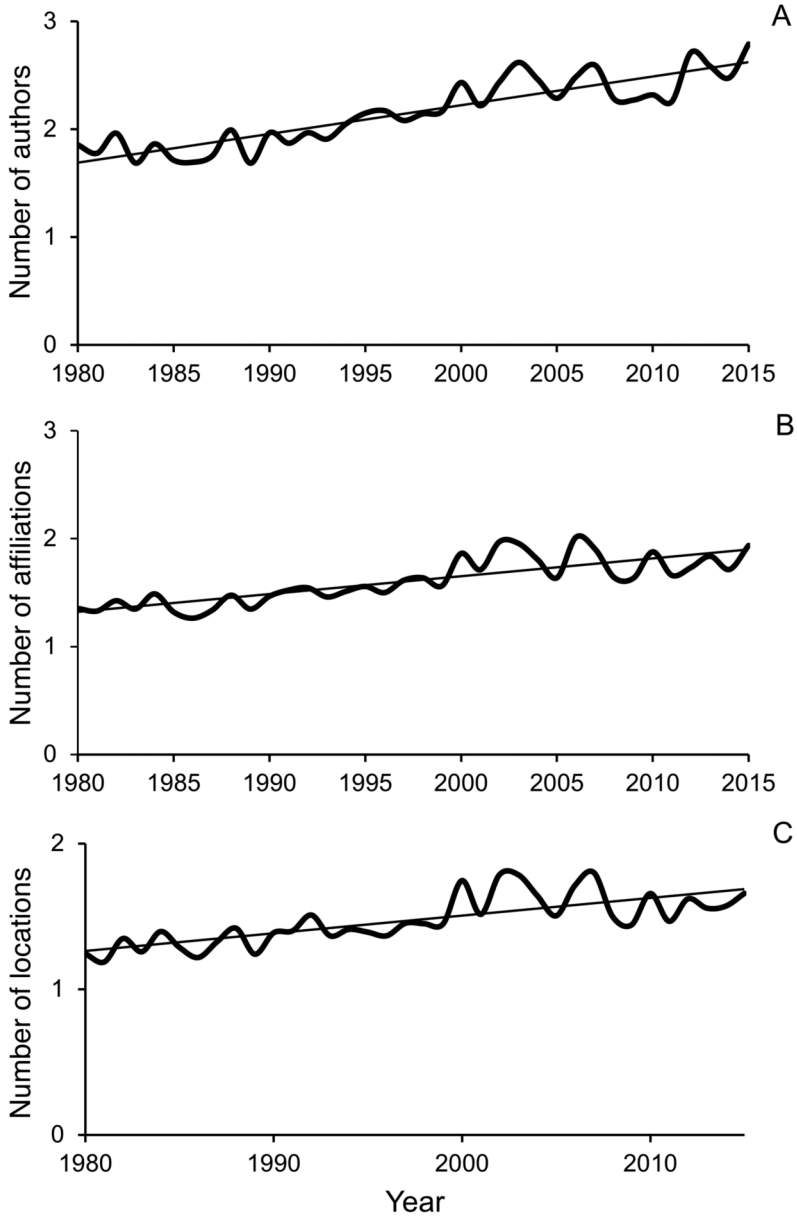

FIGURE 3. Number of authors (A), number of affiliations (B), and number of locations (C) for all articles published in *The Canadian Field-Naturalist* between 1980 and 2015. Solid lines represent the line of best fit for the trend.

realm of science and engineering (Wuchty *et al.* 2007) are similarly affecting authors in CFN.

Although the number of affiliations and locations did increase through time, the average increase is not very meaningful because it is less than one new affiliation or location between 1980 and 2015; the fact that the trend is statistically significant means that some more recent papers did have a greater number of affiliations and locations than older papers. The number of affiliations and locations are also highly correlated with the number of authors per article (r = 0.73 and 0.66, respectively), therefore the increasing trend in the number of affiliations and locations per year might simply be an artefact of the increasing number of authors per year. Increased authors, affiliations, and locations are likely all related to a general trend of increasing collaboration among authors.

First author location and affiliation

More authors were from Canada than from other countries, although many authors were also from the USA. The number of articles published by Canadian authors decreased sharply through time by 1.33 articles per year (line of best fit: y = 2710.8 – 1.33 x; 95% CI_{slope} = −1.70 to −0.95; Figure 4A; r^2_{adj} = 0.91); Canadian authors published roughly 100 articles per year in the 1980s, and this decreased to roughly 50 articles per year in the 2010s. Authors from the USA similarly published fewer articles with time, although the rate of decrease was only 0.34 articles per year (line of best fit: y = 704.8 – 0.34 x; 95% CI_{slope} = −0.55 to −0.14); authors from the USA published roughly 25 articles per year in the 1980s, and less than 20 articles per year in the 2010s. Authors from locations outside of Canada and the USA published rarely, and this trend did not change through time (line of best fit: y = −70.3 + 0.04 x; 95% CI_{slope} = −0.019 to 0.09).

Within Canada, the greatest number of authors was from Ontario. Many authors were also from Alberta, British Columbia, and Québec. All other provinces and territories had few and variable authors. Ontario had the

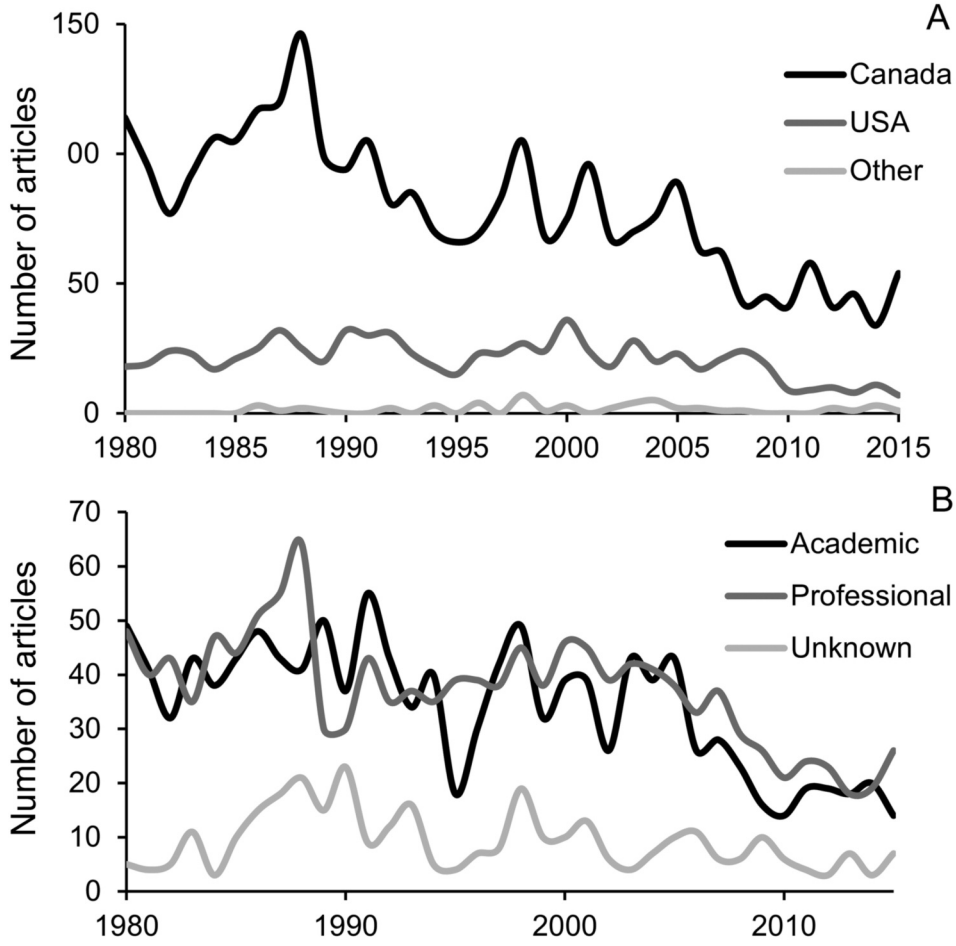

FIGURE 4. Number of articles published in *The Canadian Field-Naturalist* between 1980 and 2015 by authors in different locations (A) and with different affiliations (B).

strongest decrease in articles per year, followed by Alberta, Québec, and Manitoba; all other provinces and territories did not have a significant rate of change (Table 1). Within Ontario, roughly one third of authors were from the Ottawa region. Within Ottawa, the number of articles published decreased by 0.20 per year (line of best fit: y = 400.5 − 0.20 x; 95% CI_{slope} = −0.28 to −0.11), whereas in the rest of Ontario, the number of articles published decreased by 0.47 per year (line of best fit: y = 945.8 − 0.47 x; 95% CI_{slope} = −0.64 to −0.30). Articles published by authors from Ottawa decreased from 11 per year in 1980 to four per year in 2015, whereas in the rest of Ontario, articles decreased from 23 articles per year in 1980 to seven articles per year in 2015.

TABLE 1. Slope estimates for yearly number of articles published in *The Canadian Field-Naturalist* by authors from Canadian provinces and territories.

Province/Territory	Articles/Year
Alberta	−0.27*
British Columbia	−0.06
Manitoba	−0.10*
New Brunswick	0.01
Newfoundland and Labrador	−0.04
Northwest Territories	0.00
Nova Scotia	−0.03
Nunavut Territory	0.00
Ontario	−0.66*
Prince Edward Island	0.00
Québec	−0.11*
Saskatchewan	−0.04
Yukon Territory	0.03

*Represents a statistically significant rate of change, where the 95% CI does not overlap with 0.

Authors were just as likely to be from an academic (university or college) or professional (government and non-government) affiliation, and a small number of authors did not provide affiliation information or provided their home address. The number of academic authors decreased through time by 0.79 articles per year (line of best fit: y = 1622.0 − 0.79 x; 95% CI_{slope} = −1.06 to −0.53) and the number of professional authors decreased through time by 0.65 articles per year (line of best fit: y = 1339.9 − 0.65 x; 95% CI_{slope} = −0.90 to −0.41; Figure 4B; r^2_{adj} = 0.80), whereas the number of authors with an unknown affiliation decreased by 0.16 articles per year, although this decrease was not statistically significant (line of best fit: y = 322.6 − 0.16 x; 95% CI_{slope} = −0.32 to 0.01).

Given that CFN is a Canadian journal that specifically publishes articles about Canadian species, and issues that are relevant to Canadian species, it is logical that the majority of authors are Canadian, and that a smaller subset are from the USA that has many of the same species as Canada. Almost all authors from outside of Canada and the USA collaborated with a Canadian author or studied a species in Canada.

Within Canada, most authors were from the provinces with the largest populations (Ontario, Québec, Alberta, and British Columbia). Within Ontario, many authors (roughly one third) were from Ottawa, even though less than 10% of the Ontario population resides near Ottawa (Ottawa-Gatineau 2015 population = 1.3 million, Ontario 2015 population = 13.8 million; Statistics Canada 2016). Authors from Ottawa likely feel some connection to CFN because it is affiliated with the Ottawa Field-Naturalists' Club, and thus has ties to the local area. Indeed, many authors from Ottawa may also be members of the Ottawa Field-Naturalists' Club. Ottawa is also a hub for government employees, and contains multiple research-intensive agencies that employ scientists that study different aspects of natural history.

Similar numbers of authors were from academic and professional affiliations, which suggests that CFN is an important outlet for natural history professionals. This is vastly different from some other journals that cater almost wholly to academics (W.D.H., personal observation). Although there were low numbers of authors that did not provide affiliation information, it is possible that many of these authors are either amateur naturalists, or professional scientists that conducted studies unrelated to their job, and therefore collected data and wrote manuscripts on their own time. Indeed, CFN has been an important outlet for natural history observations by amateur naturalists since its inception (Cook 1986; Brunton 2004), and many editors have strived to continue the tradition of having CFN as an outlet for both professional scientists and amateur naturalists (Mosquin 1970; Smith 1977, 1979, 1980). Unaffiliated authors are also the only group that are not significantly decreasing their number of contributions through time. This lack of trend is important, especially because CFN was losing unaffiliated authors between the 1950s and 1970s (Smith 1979).

Which articles are being published less?

The general trend of fewer articles being published every year was seen in each subsequent analysis. Categories that were common, such as Canadian authors, vertebrate articles, and basic biology articles, all had the strongest decrease in the number of articles per year. In fact, the only categories that did not decrease through time were the rare categories, such as international authors and non-vertebrate taxonomic groups, and the only significant increase through time was in the number of authors per paper (and their affiliations and locations).

Conclusions

The Canadian Field-Naturalist is clearly a dynamic publication, as demonstrated by these temporal trends in publication patterns. Fewer but longer articles are being published every year. More authors per paper with greater collaboration are publishing every year. The majority of authors are Canadian and with either

an academic or professional affiliation. Most studies focus on vertebrates, and most of these focus on mammals, followed by birds, and then fish. Studies on basic biology are most common, although articles on conservation and geographic ranges are also common. CFN has been an important outlet for many professional scientists, unlike many other journals that tend to be dominated by academic authors. CFN has also been an important outlet for articles on geographic range extensions and conservation status reports.

The Canadian Field-Naturalist has successfully been an outlet for recording various Canadian natural history observations for over 130 years, and despite the recent decrease in the number of articles published per year, CFN continues the tradition of publishing important observations about Canadian species. Future work should expand the time frame of these analyses to fully document the history of CFN. Authors should continue to submit their natural history observations to CFN, not only because these observations are incredibly interesting to other naturalists (both amateurs and professionals alike), but also because these records serve as an important baseline for the conservation of species (Bury 2006).

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Literature Cited

Arnold, S. J. 2003. Too much natural history, or too little? Animal Behaviour 665: 1065–1068. https://doi.org/10.1006/anbe.2003.2143

Bury, R. B. 2006. Natural history, field ecology, conservation biology and wildlife management: time to connect the dots. Herpetological Conservation and Biology 1: 56–61.

Brunton, D. F. 2004. Origins and history of the Ottawa Field-Naturalists' Club. Canadian Field-Naturalist 118: 1–38. https://doi.org/10.22621/cfn.v118i1.879

Burnett, J. A. 1999. A passion for wildlife: a history of the Canadian Wildlife Service, 1947–1997. Canadian Field-Naturalist 113: 1–183.

Callaghan, C. 2011. The importance of natural history and *The Canadian Field-Naturalist* to natural science. Canadian Field-Naturalist 125: 2–4. https://doi.org/10.22621/cfn.v125i1.1119

Cook, F. R. 1986. The "one hundredth" volume of the Canadian Field-Naturalist. Canadian Field-Naturalist 100: 140–142.

Cranmer-Bying, J. L. 1996. A life with birds: Percy A. Taverner, Canadian Ornithologist, 1875–1947. Canadian Field-Naturalist 110: 1–254.

Fitzsimmons, J. M., and **J. H. Skevington.** 2010. Metrics: don't dismiss journals with a low impact factor. Nature 466: 179. https://doi.org/10.1038/466179c

Lopez, B. 2001. The naturalist. Orion: People and Nature 20: 38–43.

McCallum, M. L., and **J. L. McCallum.** 2006. Publication trends of natural history and field studies in herpetology. Herpetological Conservation and Biology 1: 62–27.

Mosquin, T. 1970. Editorial policy of the Canadian Field-Naturalist. Canadian Field-Naturalist 84: 3.

Peters, R. H. 1980. From natural history to ecology. Perspectives in Biology and Medicine 23: 191–203. https://doi.org/10.1353/pbm.1980.0042

Pringle, J. S. 1995. The history of the exploration of the vascular flora of Canada. Canadian Field-Naturalist 109: 291–356.

R Core Team. 2015. R: A language and environment for statistical computing. R Foundation for Statistical Computing, Vienna, Austria.

Reddoch, J. M., and **A. H. Reddoch.** 1997. The orchids in the Ottawa district: floristics, phytogeography, population studies and historical review. Canadian Field-Naturalist 111: 1–185.

Smith, L. C. 1977. Editorial policy. Canadian Field-Naturalist 91: 117–121.

Smith, L. C. 1979. The Canadian Field-Naturalist – the status quo or a new direction? Canadian Field-Naturalist 93: 10–15.

Smith, L. C. 1980. Feedback on the roles of The Canadian Field-Naturalist. Canadian Field-Naturalist 94: 92–96.

Smith, L. C., and **D. A. Smith.** 1975. Looking ahead. Canadian Field-Naturalist 89: 1–4.

Statistics Canada. 2016. Summary tables. Accessed 15 July 2016. http://www.statcan.gc.ca/tables-tableaux/sum-som/index-eng.htm.

Stebbins, R. C., and **N. W. Cohen.** 1995. A Natural History of Amphibians. Princeton University Press, Princeton, New Jersey, USA.

Taylor, R. 1981. Is the impact factor a meaningful index for the rankings of scientific research journals? Canadian Field-Naturalist 95: 236–240.

Thomson Reuters. 2016. InCites journal citation reports. Accessed 13 July 2016. https://incites.thomsonreuters.com.

Wuchty, S., B. F. Jones, and **B. Uzzi.** 2007. The increasing dominance of teams in production of knowledge. Science 316: 1036–1039. https://doi.org/10.1126/science.1136099

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