

## EDITORIALS AND ANNOUNCEMENTS

*NON-PEER REVIEW SECTION*

### ***HERPETOLOGICAL CONSERVATION AND BIOLOGY: HAS THE JOURNAL BEEN A SUCCESS?***

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#### **ABSTRACT**

**Abstract.**—When *Herpetological Conservation and Biology* (*HCB*) was launched as an open-access online journal in 2006, its stated goal was to expand publication of worthy material on natural history, field ecology, conservation, and management of amphibians and reptiles. Herein, I evaluate whether this goal has been achieved by quantifying the productivity of *HCB* and four other herpetological journals based in the United States (*Journal of Herpetology*, *Herpetological Review*, *Herpetologica*, and *Copeia* [herp material only]) from 2005–2018. I also evaluate whether *HCB* differs from the other journals in topics, taxa, and countries represented. *Herpetological Conservation and Biology* has grown to comprise 27.1% of all pages produced by the five journals collectively in 2018. For contributed research articles on new material (excluding articles on systematics, which *HCB* does not publish), production by the five journals collectively increased from 2005 to 2018 by 27% in number of articles and by 68% in number of pages. These increases can be attributed primarily to growth of *HCB* because the output for each of the other four journals showed a decrease or little change over this time. *Herpetological Conservation and Biology* fills a somewhat different niche than the other journals because a large fraction of its articles (51.5%) address conservation matters, which contrasts to 21.3% for the other four journals collectively, and only the other journals address systematics-related material (17.3% of articles). Success of the new journal may be attributed to carving a somewhat different niche from the other journals, increasing publication capacity, and publishing as an open-access journal with no cost to authors.

#### **INTRODUCTION**

The journal *Herpetological Conservation and Biology* (*HCB*) was launched in 2006 in response to a perceived need within the herpetological community for more opportunities to publish certain kinds of research material (Bury et al. 2006). Specifically, the goal was “to expand publication of worthy material on natural history, field ecology, conservation, and management of amphibians and reptiles” (Bury et al. 2006). The journal would publish “in-depth scientific articles (no news notes),” as well as “broader implications of studies on conservation and management issues” through articles comprising critical reviews and perspectives. The intent was “to complement the existing printed journals in herpetology and conservation biology” rather than to compete with them. This would be accomplished by carving “a niche somewhat different from other current

publications,” recognizing that there would be some overlap and thus likely some competition. The journal would be published on an electronic platform with open access (i.e., available online and free to readers) and no page charges to authors. These features were unique among herpetological journals at the time.

*Herpetological Conservation and Biology* has grown from 134 pages in 2006 to 752 pages in 2018, publishing articles in each issue on many topics, on many taxa, and from many countries. It has remained an online journal with open access and no cost to both authors and readers. Although these attributes suggest that the journal has been a success, there has been no assessment of whether *HCB* has indeed met its initial goals and intents. Herein, I evaluate the following questions: (1) Has *HCB* met its goal to expand publication opportunities on its initial topics list? (2) Has *HCB* indeed carved a niche different from other publications? (3) To what

extent has *HCB* complemented versus competed with other herpetological journals? I address these questions by quantifying production by *HCB* and several other journals, and comparing research articles produced by topic, taxa, and country representation.

## MATERIALS AND METHODS

I quantified annual production by *HCB* and four other herpetological journals based in the U.S. for the 13-y period from 2005, the year before launch of *HCB*, through 2018. The other journals were *Journal of Herpetology*, *Herpetological Review*, *Herpetologica*, and *Copeia* (herp related material only). I selected these four journals for comparison with *HCB* because they each publish articles on the broad range of subjects represented in *HCB*, and the potential for competition between *HCB* and other herpetology journals seemed greatest for journals from the same country.

I focused analysis on research articles because this is the predominant type of article produced by *HCB*, and they also comprise most of the pages in the other journals collectively. A research article is defined here as a contributed article presenting new material, typically with separate sections for introduction, materials and methods, results, and discussion. Thus, I excluded proceedings of symposia, reviews, perspectives, and other material. For *Herpetological Review* I included only articles in the Articles section of the journal (which excludes those listed as Articles in the Table of Contents that appeared in the Geographic Distribution section of the journal through 2010). I quantified production as number of articles and number of pages.

I also quantified production by the other four journals for research articles exclusive of those addressing systematics or phylogeny because *HCB* does not publish on articles on these topics. This allowed separate comparisons between *HCB* and the other journals limited to the topics they have in common. These topics (defined below) are deemed to represent the subjects of “natural history, field ecology, conservation, and management of amphibians and reptiles” referred to in the goal for *HCB* (Bury et al. 2006).

To evaluate whether *HCB* fills a different niche from the other journals, I categorized each article in selected years by topic addressed, taxa addressed, and country representation. For this comparison, I used articles from 2018 for the four other journals, and I combined articles from 2017 and 2018 for *HCB* so the sample sizes for the two groups would be similar. For topic categories, I used the seven major topics that have been used by *Journal of Herpetology* in their Table of Contents for many years: behavior, conservation, development, ecology, morphology, physiology, and systematics. I reviewed titles and abstracts for articles in *Journal of*

*Herpetology* for 2015–2018 to understand the basis for classifying each article to its assigned subject area. Then, I categorized each article in the other journals, attempting to do this in the same manner as done in *Journal of Herpetology*. To compare changes in production between 2005 and 2018, I quantified change in number of articles and number of pages by the above topic categories.

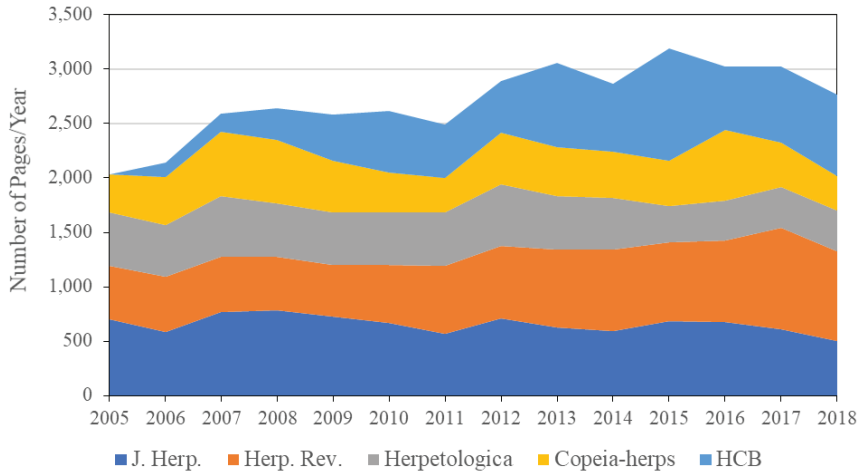
To evaluate taxonomic representation among articles, I categorized each article by major taxonomic group addressed: frog, salamander, testudines, lizard, snake, other reptile (i.e., crocodylian, tuatara, or amphisbaenian), or combinations thereof. To evaluate country representation among articles, I determined the primary country for each article as the location of the study area or species addressed. If more than one country was represented, I selected the country that appeared to have the greatest influence in the study based on number of sites or specimens. I also determined the country affiliation of the first author. If more than one country affiliation was listed for the first author, I used the first affiliation listed. I compared frequency differences in topics, taxa, and country representation between *HCB* and the other journals collectively by Chi-square tests with  $\alpha = 0.05$ . For significant Chi-square tests, I conducted post hoc tests using Chi-square with Yates correction for continuity and Bonferroni adjustment of  $\alpha$  for the number of comparisons.

## RESULTS

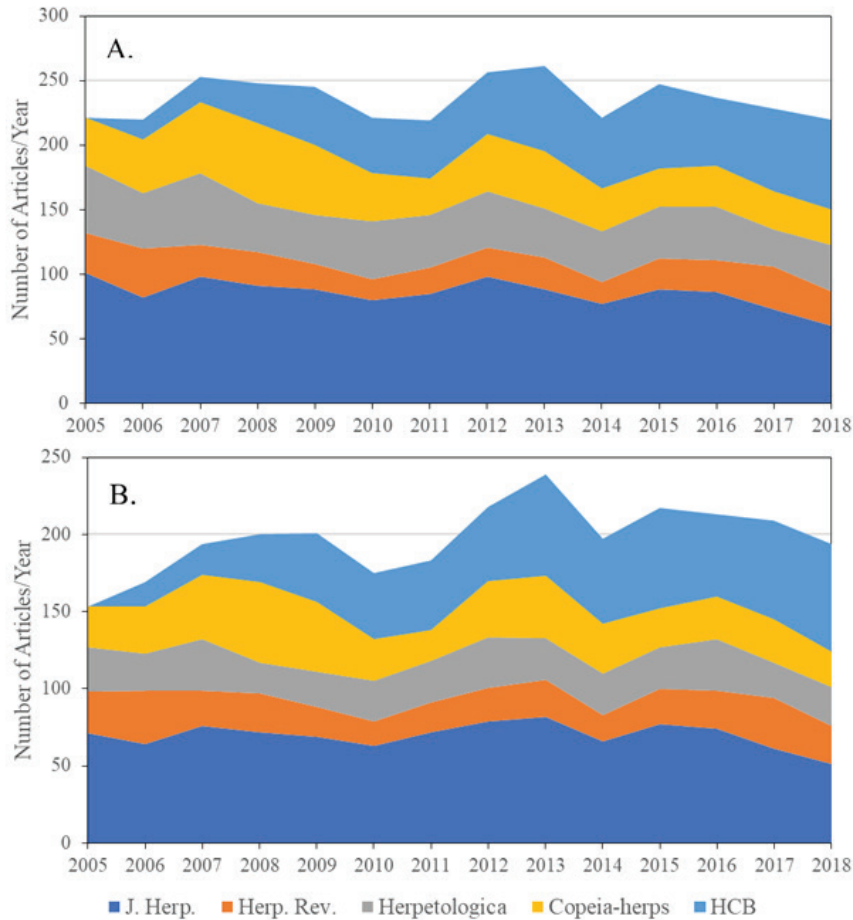
**Productivity of journals, 2005–2018.**—The total page production for all five herpetological journals combined increased by 36.1% between 2005 and 2018 (Fig. 1). This increase can be attributed to increases in page production by *HCB* and *Herpetological Review* because production decreased for *Journal of Herpetology* and *Herpetologica*, and remained about the same for *Copeia*. *Herpetological Conservation and Biology* comprised 27.1% of the 2,770 total pages produced by the five journals in 2018.

Research articles comprised the majority of pages produced by the five journals combined, about 72% in 2018. Between 2005 and 2018, productivity of all research articles by the five journals combined was virtually unchanged for number of articles (Fig. 2A), whereas it increased in number of pages by 26.0% (data not shown). Productivity of *HCB* increased over this 13-y period to comprise the largest fraction of research articles among the journals (31.8% of articles; 37.9% of pages). By contrast, productivity for the other four journals collectively decreased by 32.1% in number of articles and 21.7% in number of pages.

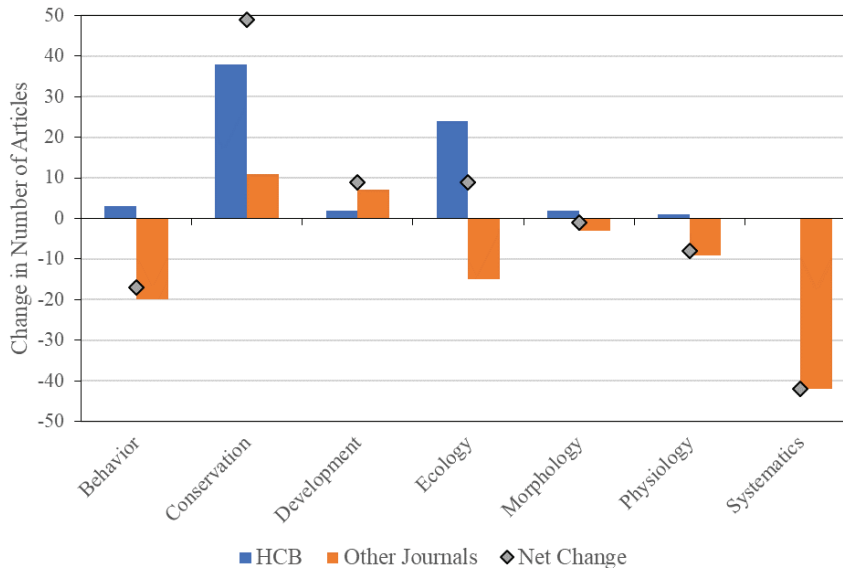
For the research articles addressing just the topics covered by *HCB* (i.e., all topic categories except



**FIGURE 1.** Annual page production of all paginated material by *Journal of Herpetology*, *Herpetological Review*, *Herpetologica*, *Copeia* (herp related only), and *Herpetological Conservation and Biology* (HCB) from 2005 to 2018.



**FIGURE 2.** Number of articles produced per year for (A) all research articles, and (B) research articles on topics other than systematics, by *Journal of Herpetology*, *Herpetological Review*, *Herpetologica*, *Copeia* (herp related only), and *Herpetological Conservation and Biology* (HCB) from 2005 to 2018.



**FIGURE 3.** Changes in number of articles produced between 2005 and 2018 for all research articles by topic for *Herpetological Conservation and Biology* (*HCB*) and the other four journals collectively. Net change represents the changes for *HCB* and the other journals added together. The other journals are *Journal of Herpetology*, *Herpetological Review*, *Herpetologica*, and *Copeia* (herp component only).

systematics), productivity of the five journals combined increased from 2005 to 2018 by 26.8% in number of articles (Fig. 2B) and by 67.9% in number of pages (data not shown). These increases can be attributed almost entirely to increases in production by *HCB* because production for each of the other four journals decreased or stayed about the same during this time, except for a relatively small increase in number of pages for *Herpetological Review*. In 2018 *HCB* comprised the largest fraction of articles among the journals: 36.1% for number of articles and 44.9% for number of pages.

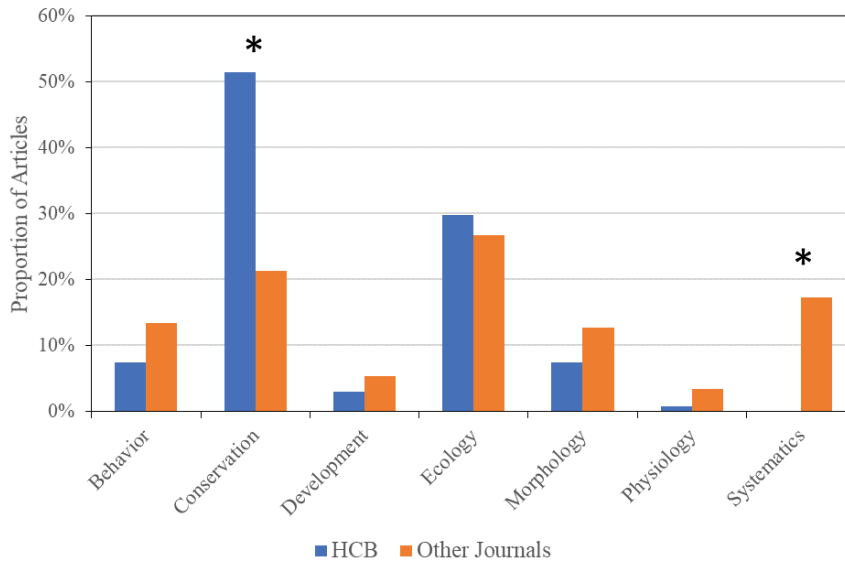
The changes in production of research articles between 2005 and 2018 differed substantially between *HCB* and the other journals depending on topic category (Fig. 3). Growth for *HCB* was almost entirely for the topics of conservation (38 articles; 428 pages) and ecology (24 articles; 256 pages). By contrast, changes for the other four journals collectively were negative for five of the seven categories, with prominent declines for systematics (42 articles; 269 pages), behavior, and ecology. Only conservation and development showed growth for the four other journals collectively. For all five journals combined, the net change between 2005 and 2018 was substantial growth for conservation and some growth for ecology and development, with conspicuous declines for systematics and behavior and some decline for physiology.

**Niche of *HCB*.**—The niche of *HCB* differs somewhat from that of the other four journals collectively. In the analysis of topics addressed for all research articles, the distribution of articles among the seven topic categories differed significantly between *HCB* and the other four

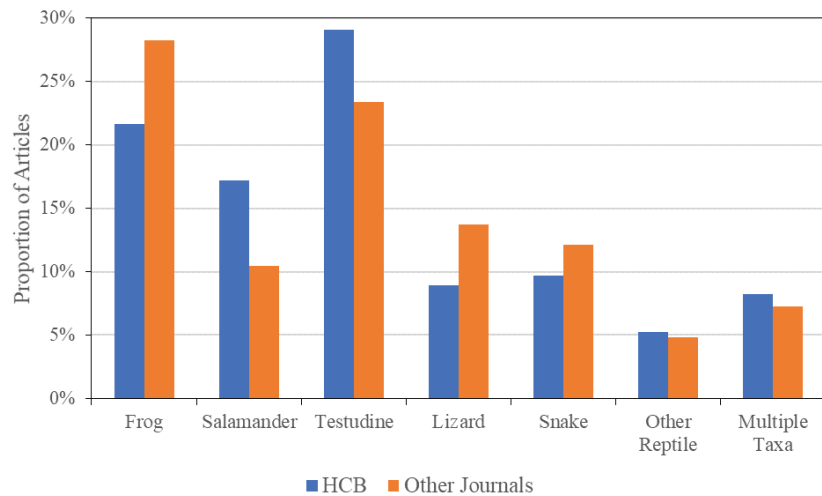
journals ( $X^2 = 48.94$ ,  $df = 6$ ,  $P < 0.001$ ; Fig. 4). The differences were most pronounced for conservation and systematics. For conservation, over half (51.5%) of the *HCB* articles fell in this category, whereas only 21.3% of the articles for the other journals were on conservation (adjusted  $\alpha = 0.05/7 = 0.001$ ). For systematics, 17.3% of the articles for the other journals were on systematics, which represents a de facto difference between *HCB* and the other journals because *HCB* does not publish articles on this topic. For both *HCB* and the other journals, ecology was strongly represented at 27–30% of articles.

By contrast, the taxa addressed by research articles other than those on systematics did not differ significantly between *HCB* and the other journals collectively ( $X^2 = 5.714$ ,  $df = 6$ ,  $P = 0.456$ ; Fig. 5). Most articles (about 92%) addressed a single taxonomic group, and many articles addressed a single species. Testudines and frogs were the most frequently addressed for both *HCB* and the other journals (23–29% for testudines; 22–28% for frogs). These taxa were followed by salamanders, lizards, and snakes. Relatively few studies (about 8%) addressed multiple taxa such as frogs and salamanders, or both amphibians and reptiles. Among the articles addressing a single taxon (i.e., excludes the multiple taxa category in Fig. 5), reptiles were more frequently represented than amphibians (i.e., 57.7% for *HCB* and 58.3% for the other journals collectively).

Many countries were represented among the research articles in *HCB* and the four other journals. For the country of the primary study area in each article, 28 countries were represented among 134 articles in *HCB* in 2017–2018, and 30 countries were represented among 120 articles in the four other journals collectively in



**FIGURE 4.** Proportion of all research articles in seven topic categories for *Herpetological Conservation and Biology* (*HCB*) in 2017 and 2018 combined ( $n = 134$ ) and for the four other journals collectively in 2018 ( $n = 150$ ). The asterisk (\*) for Conservation indicates a significant post-hoc Chi-square test (see text) and for Systematics the symbol indicates a de facto difference between *HCB* and the other journals because *HCB* does not publish articles on Systematics. The other journals are *Journal of Herpetology*, *Herpetological Review*, *Herpetologica*, and *Copeia* (herp component only).



**FIGURE 5.** Proportion of research articles on topics other than systematics for seven taxonomic categories for *Herpetological Conservation and Biology* (*HCB*) in 2017 and 2018 combined ( $n = 134$ ) and for four other journals collectively in 2018 ( $n = 124$ ). Other Reptile refers to crocodylian, tuatara, or amphisbaenian. The Multiple Taxa category represents articles on two or more of the other taxonomic groups. The other journals are *Journal of Herpetology*, *Herpetological Review*, *Herpetologica*, and *Copeia* (herp component only).

2018 (Table 1). The frequency of countries did not differ significantly between *HCB* and the four other journals ( $\chi^2 = 5.395$ ,  $df = 4$ ,  $P = 0.245$ ). The U.S. dominated the number of articles, with 51.5% of the articles in *HCB* and 55.0% of the articles in the four other journals. The next most frequent countries among the five journals combined were Canada, Mexico, and Brazil. Many countries were represented by a single article.

For the country of affiliation for the first author in each article, 24 countries were represented among 134 articles in *HCB* in 2017–2018, and 24 countries

were represented among 124 articles in the four other journals collectively in 2018 (Table 2). The frequency of countries did not differ significantly between *HCB* and the four other journals ( $\chi^2 = 4.293$ ,  $df = 4$ ,  $P = 0.368$ ). The U.S. dominated the first-author affiliations, with 56.0% of the articles in *HCB* and 62.1% of the articles in the four other journals. The next most frequent countries among the five journals combined were Canada, Brazil, and Argentina. The first-author affiliation for many countries was represented by a single article.

# Herpetological Conservation and Biology

**TABLE 1.** Country of primary study location for research articles. Articles on systematics are excluded. Data are for *Herpetological Conservation and Biology* in 2017–2018 (n = 134 articles from 28 countries) and for four other journals collectively in 2018 (n = 120 articles from 30 countries). The four other journals are *Journal of Herpetology*, *Herpetological Review*, *Herpetologica*, and *Copeia* (herp component only).

Journal/Country	Number of Articles	Cumulative % of Articles
<i>Herpetological Conservation and Biology:</i>		
USA	69	51.5%
Canada	8	57.5%
Argentina	7	62.7%
Mexico	7	67.9%
Italy	5	71.6%
Brazil	4	74.6%
Colombia	3	76.9%
Spain	3	79.1%
eight other countries	2	91.0%
12 other countries	1	100.0%
Four Other Herp Journals:		
USA	66	55.0%
Brazil	10	63.3%
Canada	5	67.5%
Australia	3	70.0%
Colombia	3	72.5%
Mexico	3	75.0%
Tanzania	3	77.5%
four other countries	2	84.2%
19 other countries	1	100.0%

**TABLE 2.** Country affiliation of first author for research articles. Articles on systematics are excluded. Data are for *Herpetological Conservation and Biology* in 2017–2018 (n = 134 articles from 24 countries) and four other journals collectively in 2018 (n = 124 articles from 24 countries). The other journals are *Journal of Herpetology*, *Herpetological Review*, *Herpetologica*, and *Copeia* (herp component only).

Journal/Country	Number of Articles	Cumulative % of Articles
<i>Herpetological Conservation and Biology:</i>		
USA	75	56.0%
Canada	8	61.9%
Argentina	7	67.2%
Italy	5	70.9%
Mexico	5	74.6%
Brazil	4	77.6%
Spain	4	80.6%
Colombia	3	82.8%
seven other countries	2	93.3%
nine other countries	1	100.0%
Four Other Herp Journals:		
USA	77	62.1%
Brazil	8	68.5%
Canada	6	73.4%
United Kingdom	4	76.6%
Argentina	3	79.0%
Germany	3	81.5%
five other countries	2	89.5%
13 other countries	1	100.0%

## DISCUSSION

**Growth of publication output.**—*Herpetological Conservation and Biology* has clearly attained its goal “to expand publication of worthy material on natural history, field ecology, conservation, and management of amphibians and reptiles” (Bury et al. 2006). Evidence for this comes from the analysis of research articles exclusive of articles on systematics because the topics remaining in this data set (i.e., behavior, conservation, development, ecology, morphology, and physiology) can be deemed to represent the topics in the goal statements. Production of research articles in this data set by the five journals combined increased substantially from 2005 to 2018. Nearly all of this growth can be attributed to that of *HCB* because production for the other four journals declined or increased little during this time.

This growth in output among the five journals combined did not occur equally among topics. The increase was predominantly for articles on conservation and to lesser extents, ecology and development. Between 2005 and 2018 the fraction of research article output for the journals increased for conservation from 9.5% to 31.8%, for ecology from 24.9% to 29.1%, and for development from 0.5% to 4.9%. *Herpetological Conservation and Biology* dominated in production of articles on these topics by having 92% its articles in these three categories. In contrast to articles in these three categories, however, production of articles by the five journals combined decreased substantially between 2005 and 2018 for systematics and to lesser extents for behavior and physiology.

The drivers for the growth of *HCB* may be many. First, interest and funding for conservation, ecology, and development may have increased over the 13-y period



of assessment relative to that for systematics, behavior, and physiology. Second, by providing a new outlet for publication of herpetological research, competition for publication space in the existing journals may have been reduced, thus allowing publication of material that otherwise might have been rejected or not submitted for publication. Third, *HCB* is an open-access online journal with no financial cost to authors, and articles are almost always published within a few months of final acceptance. These features may have proved attractive to some authors.

**Complementarity and competition.**—There is evidence that *HCB* has both complemented and competed with the other journals. *Herpetological Conservation and Biology* has apparently complemented the other journals by carving a somewhat different niche. Specifically, in recent issues *HCB* published over half its research articles on conservation matters, whereas the other journals published only about a fifth of their articles on this topic. By far the largest growth component for the five journals combined between 2005 and 2018 was for conservation articles, and *HCB* accounted for most of this growth in output. *Herpetological Conservation and Biology* also complements the other journals by not publishing any articles on systematics, whereas articles on systematics comprised 17% of the articles published by the other journals in 2018. Complementarity may have been even greater at the launch of *HCB* in 2006 because the fraction of articles on conservation in the other journals in 2005 was less than half what it was in 2018, and the proportion of articles on systematics in the other journals in 2005 was nearly double what it was in 2018 (data not presented).

The potential for competition between *HCB* and the other journals clearly exists because *HCB* and the other journals published similar proportions of articles on ecology, behavior, morphology, development, and physiology in 2018, although the amounts for the latter two were small. Evidence that competition may have occurred comes from the comparison of change in article output by topic between 2005 and 2018 (Fig. 3). Specifically, the output of articles on ecology for the other four journals declined between 2005 and 2018, whereas the growth in output of articles on ecology by *HCB* far exceeded this amount. This finding suggests that *HCB* outcompeted the other journals for articles on ecology. For the other topics that declined for the other journals and had potential for competition with *HCB* (i.e., behavior, physiology, and morphology), however, competition appears to have been small because the amount of growth by *HCB* for these topics was small relative to the extent of decline by the other journals.

To the extent that competition may have occurred between *HCB* and the other journals, the mechanism

for this is unknown. It is possible that authors chose to submit manuscripts to *HCB* over the other journals. Reasons for this could have been that *HCB* is an open-access online journal with no charges and rapid production. Alternatively, however, authors may have initially submitted manuscript to one of the other journals, had it rejected, and subsequently submitted it to *HCB*.

**Journal metrics.**—The journal impact factor and h-index for a journal are metrics that are sometimes used as proxies for the relative importance of the journal within its field, although there is much disagreement about the merits of such use (Braun et al. 2006; Baldock 2007; Larivière, V., and C.R. Sugimoto. 2018. The Journal Impact Factor: a brief history, critique, and discussion of adverse effects. arXiv: Digital Libraries. Available at <https://arxiv.org/abs/1801.08992v2> [Accessed 25 August 2019]). The journal impact factor reflects the frequency of citations received for recent articles in the journal within a given time, whereas the h-index was designed to reflect both the quality and quantity of scientific output (Braun et al. 2006; Larivière and Sugimoto, *op. cit.*). Values for these two metrics for *HCB* fall in the middle 50% of values among herpetological journals of the world (Claviate Analytics. Web of Science Group Master Journal List Beta. Available from <https://apps.clarivate.com/mjl-beta> [Accessed 24 August 2019]; Google Scholar. Metrics. [Accessed 8 October 2019]). Specifically, the 2018 journal impact factor for *HCB* is 0.719, which ranks 12th out of 16 rated herpetological journals, whereas its 5-y h-index (July 2019) is 13, which ranks tied for 4<sup>th</sup> among 11 rated herpetological journals (Claviate Analytics, *op. cit.*; Google Scholar. *op. cit.*).

Values for both metrics are lower for *HCB* than the three other rated US journals analyzed here. Specifically, the journal impact factors and 5-y h-index values for the other journals are: *Copeia* (1.018, 15), *Journal of Herpetology* (1.030, 17), and *Herpetologica* (1.380, 15; Claviate Analytics, *op. cit.*; Google Scholar. *op. cit.*). The lower impact factor for *HCB* in comparison to the above journals is not unexpected given that one of the intents in creating *HCB* was to provide an outlet for some material that “appeared to lack a home in other journals” (Bury et al. 2006). Moreover, another intent was to relieve some of the keen competition for publication space among existing journals, as this would allow for the publication of additional meaningful research that might not otherwise be published or even submitted for publication. The editors of a journal may strive to increase the impact factor for the journal by increasing the rejection rate of submitted manuscripts. The editors of *HCB*, however, remain committed to publishing sound research on the

natural history and conservation of amphibians and reptiles rather than chase an impact factor.

**Conclusion.**—*Herpetological Conservation and Biology* has been successful in adding capacity to the publication opportunities for herpetological journals, especially for research addressing conservation matters. The journal has risen to a prominent position among the herpetological journals evaluated in number of research articles and pages produced. It appears to have done this by carving a somewhat different niche from the other herpetological journals, increasing publication capacity, and by publishing as an open-access online journal with no cost to authors and rapid publication after final acceptance of an article.

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