Comparing metrics of influence, impact, and prestige among ecology journals (importance): or what’s the deal with all those metrics?

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Abstract

Introduction

Scientists are often interested in quantifying the universe, so the interest in quantitative metrics of publishing influence is not surprising. The competitive nature of academia and scientific publishing also increases the interest in metrics of influence, impact, and prestige. The perceived importance of journals can influence the choice of publication venue for scientists. Some researchers may even make submission decisions based on a cost-benefit analysis, where financial cost or journal rejection rate compared with the benefit of publishing in highly prestigious or influential journals (ref: aarssen et al 2008). In addition to the general interest in objective metrics of influence, these metrics are increasingly being used for hiring decisions and promotion and tenure evaluation. Metrics are also used by librarians to inform journal subscription decisions. This may become increasingly important with the rising number of journals and challenges of funding higher education. Citation metrics have even been extended to compare the productivity and influence of universities and departments (REF: Fogg 2007 chronicle).

Define importance, influence, impact, and prestige?

The most widely know metric of journal influence is the Thompson Reuters Journal Impact Factor (JIF). The JIF is published annually in the Journal Citations Report (JCR) and made freely available through the ISI Web of Science. The JIF represents the mean number of citations per article for a given journal over a two-year time frame. It is simply calculated as the number of citations to articles in a journal published over the previous 2 years divided by the number of articles published by the journal during that time period. Many publishers highlight the JIF on the websites for their journals. However, being the most prominent journal influence metric comes with the cost of frequent and widespread criticisms. While the purpose here is not to evaluate the many criticisms of the JIF, I outline many of the common concerns below:

([Browman & Stergiou 2008](#_ENREF_1); [Brumback 2008](#_ENREF_2), [2009](#_ENREF_3); [Campbell 2008](#_ENREF_4); [Colquhoun 2003](#_ENREF_5); [Falagas & Alexiou 2008](#_ENREF_6); [Fuyuno & Cyranoski 2006](#_ENREF_7); [Monastersky 2005](#_ENREF_9); [Rossner et al. 2007](#_ENREF_10), [2008](#_ENREF_11); [Russ-Eft 2008](#_ENREF_12); [Smith 2008](#_ENREF_13); [The 2006](#_ENREF_14); [Walter et al. 2003](#_ENREF_15); [Wilcox 2008](#_ENREF_16))

* **Citable Materials:** As calculated by the ISI and reported in the JCR, citations outside the ISI database are not included and many citations in books are not included (refs - Harzing). This is expected to be a large problem in the humanities because much of the scholarly work is in the form of books (REF: Pendlebury 2008)
* **Free Citations:** Letters and editorials do not count towards the number of papers published but the citations to these materials (i.e. increase numerator citations but not denominator publication number). Therefore, journals with lively discussion through letters and editorials have inflated JIFs (ref: (Cameron, 2005)
* **Insufficient Time Period:** For the standard 2-year JIF, the spread of information and rate of journal publication is often not sufficient to allow for citations from outside scholars; therefore, the 2-year JIF is overly influenced by self citations (Ref: McGarty (2000:14))
* **Distributional Representation:** The JIF is also calculated as using the mean citations per article but the distribution of citations among articles in generally highly skewed (REF: Seglen 1997), making the mean and inappropriate measure of the impact of a journal as a whole. The use of the arithmetic mean is also potentially sensitive to outliers.
* **Review Articles:** The JIF is also influenced by the publication of review articles, which tend to be highly read and cited, but potentially in disproportion to their influence compared with original research papers.
* **Inflation:** The average JIF across all journals tends to increase over time as more articles are published with more citations (although many journals are now limiting the number of citations to save print space). Therefore, journals that have increasing JIFs might appear to be increasing in influence, but if their JIF could be increasing slower than the rate of inflation. These journals may be decreasing in influence compared with others in the field (REF: Nef and Olden).
* **Over simplification:** Many consider the JIF to be overly simplistic; therefore, it does not sufficiently represent the full, multidimentional scope of a journal’s influence (REF: Pendlebury 2008)
* **Multidisciplinary journals:** It can be difficult to interpret which fields of study contribute to the journal influence if many fields of study are published in one journal (REF: Pendlebury 2008)
* **Journal Exclusion:** Not all journals are indexed by Thompson Reuters and there is bias in relation to nation and languages (REF: Pendlebury 2008)
* **Manipulation:** The JIF can be manipulated through publishing practices. Increasing the rate of publication, soliciting review articles, and encouraging self-citation can enhance a journal’s impact factor.

In response to these criticisms, numerous other citation-based metrics have been put forth.

The JCR on WoS reports:

JIF, 5-year JIF, EigenfactorTM, Article Importance, and Immediacy

Table of Definitions and Calculations

JIF – Number of citations to all articles in a journal published in the previous 2 years divided by the number of articles published by that journal in that time frame

JIF5 – Same as the JIF but calculated over 5 years rather than the previous 2 years

Eigenfactor – Scholarly interactions exist in a network connected by citations among articles. The influence of an article does not necessarily stop with the publications that cite the original article but extends through the network of scholarly work citing those secondary publications. The Eigenfactor uses network theory in an algorithm, similar to Google PageRank, to iteratively resample the network to determine the influence of journals in the network. It uses a modified version of eigenvector centrality methods to overcome problems of dangling nodes at the edges of the network. The details of the algorithm are beyond the scope of this paper, but more information including the code used can be found at (<http://www.eigenfactor.org>) and the Eigenfactor is originally described in Bergstrom (REF 2007) (provide in appendix? - http://www.eigenfactor.org/methods.pdf). Of note, the Eigenfactor reported in the JCR does not include self citations and the sum the Eigenfactors for all journals in the database sums to 100. Therefore, the Eigenfactor score of a journal can be interpreted as the total influence of the journal on scholarly thought as identified through citations.

Article Influence (AI) – the citation influence of a journal on a per citation basis. It is calculated as

where EF is the Eigenfactor value and *a* is the number of articles over a 5 year time period. As with the Eigenfactor, the AI does not include self citations. The article influence score is intended to be comparable to the JIF because the EF measures the entire influence of a journal whereas the JIF and AI calculate the influence on a per-article basis.

H-index – the number of papers that have at least H citations (Hirsch ref). While originally intended as a metric of author influence, Harzing and van der Wal (REF: 2007) showed that it can be used as a metric for journal influence. Although the H-index can be calculated over any timeframe, it is often calculated over the previous 5 years when comparing current influence.

Hc-index – the contemporary H-index is an age-adjusted version of the H-index. It is calculated using gamma=4 and delta=1 by Publish or Perish software (Antonis Sidiropoulos, Dimitrios Katsaros, and Yannis Manolopoulos in their paper **Generalized h-index for disclosing latent facts in citation networks**, [*arXiv:cs.DL/0607066*](http://arxiv.org/abs/cs.DL/0607066) *v1 13 Jul 2006*.)

e-index – the square root of the number of citations above the H-index (or above h2?). It is intended to complement the H-index by differentiating between authors or journals with different citation patters but similar H-indices (Chun-Ting Zhang in his paper **The e-index, complementing the h-index for excess citations**, *PLoS ONE*, Vol 5, Issue 5 (May 2009), e5429.)

g-index – similar to the H-index but represents the number of papers such that g papers have at least g2 citations (by Leo Egghe in his paper **Theory and practice of the g-index**, *Scientometrics, Vol. 69, No 1 (2006), pp. 131-152)*

The AR-index stands for the age-dependent index calculated using square-root. It is calculated as

where *Hcore* are the publications constituting the H-index, *Citp* is the number of citations for publication *p* in the H-index, and *ap* is the age of publication *p*. The AR-index is intended to adjust the H-index for age and allow the index to decrease over time, unlike the H-index which can only increase over time ([Jin 2007](#_ENREF_8)). However, for the purpose of understanding journal influence, I calculated the AR-index including all publications found for each journal during 2007-2011. As it is age-adjusted, this should more accurately reflect the total scientific influence of each journal, at least with respect to citations (see Altmetrics for limitations).

SNIP – The Source Normalized Impact per Paper is intended to correct for differences in publication characteristics across fields of study. Some fields of study publish more quickly, allow more citations per paper, and have a greater total volume of publications than other fields. These characteristics lead to differences in most citation metrics unrelated to the influence of papers within a discipline. This may be a concern even within journals publishing ecologically-oriented papers because ecology spans a variety of disciplines including evolution, genetics, physiology, conservation, and behavior. To calculate the SNIP, the raw impact per paper is divided by the database citation potential, which adjusts for differing publication characteristics across fields of study. The SNIP is calculated over 3-year periods using Elsevier’s Scopus database and is freely available at [www.journalmetrics.com](http://www.journalmetrics.com). Greater detail on SNIP methodology can be found in REFS xxxxxxxxxxxxx (Refs: Colledge et al. 2010, Waltman et al 2013, Moed 2010)

SJR – The SCImago Journal Rank is similar to the Article Influence, in that it measures the influence of journals based on their network of citations on a per article basis. However, it differs from the AI by weighting citations based on the influence of the citing journal. Journals that act as larger hubs in the citation network receiving higher weights. Weighting is calculated iteratively. Again, the details of the SJR are beyond the scope of this paper but details can be found in Guerrero-Bote and Moya-Anegon (Ref: 2012). Of note for the purposes of this paper, the SJR is calculating using the Scopus database over a 3-year window and only citations from and to scholarly papers are used, excluding books and technical reports.

Diagram of JIF vs Eigenfactor (vs H-index) citation network?

Methods

I identified 134 ecology-related journals based on the Web of Science (WoS) Journal Citation Reports (JCR) Ecology category. For these journals, I downloaded the 5-year journal impact factor, EigenfactorTM, Article Importance, number of citations, immediacy, and citation half-life from WoS (retrieved 05 April 2013, <http://admin-apps.webofknowledge.com.libproxy.unh.edu/JCR/JCR?RQ=HOME>). I used Publish or Perish software (ref) to search Google Scholar and calculate the H-index, G-index, Hc-index, Hi-index, Hi-norm, Hm-index, E-index, and AW-index. I removed all results where Google Scholar indicated the reference type was a citation and checked for articles with incorrectly identified journals and books with the same name as a journal. All metrics of importance were calculated for articles published in the 5-year interval from 2007 – 2011. The metrics derived from Google Scholar include citations from the date of publication until the date of the query (05 – 25 April 2013).

03 May 2013: (Scopus Ecology Category) <http://www.scimagojr.com/journalrank.php/journalrank.php?area=0&category=2303&country=all&year=2011&order=sjr&min=0&min_type=cd>

Analysis

JIF relation to EF: log-log regression and nonlinear regression

JIG to AI: Linear regression

Pearson or Spearman correlation (spearman rank correlation?)

- other way to combine the slope of the exponential decline in citations with max citations?

Journals with fewer than 50 articles identified in Google Scholar searches were excluded from the analyses, as were any journals with incomplete data (i.e. inability to calculate 1 or more metrics).

Results

I compiled a total of 1,084,169 citations for 63,868 articles from 131 ecology journals from Google Scholar searches for articles published from 2007 – 2011. These were combined with data from the 2011 Thompson Reuters Journal Citations Report accessed on the Web of Science, and data from the Scopus database. From these data sources, I had sufficient data to estimate all metrics for 110 journals. From the JCR, the mean 5-year JIF was 3.31 (range: 0.134 – 18.007), with the *Annual Review of Ecology, Evolution, and Systematics* having the highest JIF. The Article Influence score mean was 1.28 (range: 0.049 – 9.273), and Eigenfactor mean was 0.0148 (range: 0.00026 – 0.09614). From the results of Google Scholar searches, I estimated mean values of 35.1 (range: ), 50.3 (range: ), 29.2 (range: ), and 37.2 (range: ) for the h-index, g-index, e-index, and AW-index, respectively. I estimated a means of xxx (range: ) and xxx (range: ) for the SNIP and SJR metrics, respectively.

Scopus?

Discussion

<http://jcn.sagepub.com/content/24/3/260.long>

<http://community.thomsonreuters.com/t5/Citation-Impact-Center/Thomson-Scientific-Corrects-Inaccuracies-In-Editorial/ba-p/717/message-uid/717>

<http://jgp.rupress.org/content/131/2/183>

<http://www.plosmedicine.org/article/info:doi/10.1371/journal.pmed.0030291>

<http://arxiv.org/abs/1010.0278>

<http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2140038/?tool=pubmed>

SJR not as useful for fields where books and technical reports are especially prominent

Scopus database large

We found that the rank of journals was highly correlated among all metrics. This is not surprising as all of the metrics are based on citations. Despite the relatively high correlation, some metrics varied considerably among the highest ranked journals.

Rankings of journals in ecology based on the 5-year JIF and the AI score correspond well. The top 3 journals based on both rankings are *Annual Review of Ecology, Evolution*, *and Systematics, Trends in Ecology and Evolution*, and *Ecology Letter*s. The first two publish primarily review articles, which tend to be highly cited and hopefully highly synthetic (more synthesis generating novel ideas or tests as opposed to simple summaries of literature). *Ecology Letters* is the highest ranked journal that focuses on primary research. The biggest different in JIF and AI among the top 20 journals in each is *Molecular Ecology*, which is ranked 9th by the 5-year JIF but only 21st by the AI score. This suggests that while the average *Molecular Ecology* article is highly cited, the influence of those articles does not spread as much through science as a whole. This may be due to higher than average rates of self-citations (with journal). This pattern may be related to *Molecular Ecology* being a slightly more specialized journal than the other ecology journals in the top 20. The *American Naturalist* also differs considerably between the two metrics, where is ranked 19th by the 5-year JIF and 11th by AI score. This suggests better spread of ideas through science compared with just the mean citations per article.

Interestingly, the ranking of journals shifts considerably when considering total scientific influence rather than influence on a per article basis. The top three journals based on Eigenfactor rank are *Proceedings of the Royal Society B: Biological Sciences, Ecology*, and *Molecular Ecology*. A journal like *Proceedings* might have a higher total influence than other ecology journals because it publishes many papers in more areas of biology than most of the journals on this list, but it is included as it is not as broad as the general science giants, *Nature, Science,* and *Proceedings of the National Academic of Sciences*. Of those journals in the top 20 of the JIF or AI indices, only 12 are also in the top 20 in Eigenfactor rank. One extreme case is the *Bulletin of the American Museum of Natural History*, which is ranked 9th and 10th by AI and JIF, respectively. *The Bulletin* is only ranked 75th by the Eigenfactor and 92nd by the H-index. The discrepancy between the first two metrics and the second two metrics (rank per article and rank on overall scientific influence) is likely a function of the number of articles published, primarily. Journals that publish more articles are likely to have greater total influence on scholarly thought, all else being equal. A publisher may try to maximize total influence by increasing publication output through increased frequency and accepting a greater number of short articles. Similarly, librarians may be interested in the subscription price of journals relative to their total influence rather than on the per article influence. Researchers, in contrast, are likely to be primarily interested in the average article influence and therefore focus on AI and JIF. *Ecology Letters* and *Trends in Ecology and Evolution* are two of the only journals that rank among the top in all metrics. This indicates they publish a large number of highly influential articles. Those articles tend to be highly cited and have influence that spread through scientific thought.

One journal that made a surprise entry into the top ecology journals is the new comer, *Methods in Ecology* *and Evolution*. This is a relatively new journal, particularly in relation to the 2007-2011 time period of this study. I believe the rise of a methodological ecology journal reveals the increasing complexity and sophistication of ecological studies and analyses. Increasing use of hierarchical models, Bayesian methods, Random Forests, Network Theory, and similarly complex analyses require a specialty journal where authors can explain challenging mathematics in terms applied to ecology. This translation facilitates the use, as evidenced by the high citation metrics, by ecologists to better understand complex and dynamic aspects of nature that could previously only be discussed qualitatively.

For journals, the H-index and its variations may better represent prestige because it is a metric of the number of highly cited papers, but does not indicate the influence per article or the total influence on the scientific field.

One appealing aspect of the Eigenfactor, as associated AI, is the relational interpretation both within and among fields. For example, *Ecology Letters* with an Eigenfactor of 0.06713 can be interpreted to have 32 times the influence on science as a whole compared with of a smaller, more specialized ecology journal such as *Pedobiologia* with an Eigenfactor of 0.00209. Similarly, *Ecology Letters* (AI: 7.38) has 52 times the influence on science per article compared with the more specialized *Journal of Freshwater Ecology* (AI: 0.143). That is not to say that *Pedobiologia* and *Journal of Freshwater Ecology* are not good journals, if fact, I selected them for comparison because they are generally high-quality journals, but with a smaller audience and narrower scope.

All the metrics compared in this paper have limitations and all evaluate slightly different aspects of journal influence.

As such, different indices may be more appropriate for different purposes.

Librarians and publishers may be interested in the total influence of particular journals, making the Eigenfactor the primary metric of interest. This can help inform decisions regarding subscriptions and purchasing.

In contrast, researchers may be interested in the chance of their article being highly influential (read and cited).

When choosing among journals as an outlet for research and scientific ideas, researchers consider numerous factors. These include…. Although, I frequently hear colleagues criticize impact factors and other metrics as irrelevant, these metrics do often play some role in how many scientists select journals for manuscript submission.

As such, the AI score may be of most interest because it is a per article representation of the Eigenfactor score. In ecology, the JIF5 is highly correlated with the AI score and could be used as an accurate estimate of a journal’s per article influence. However, this is not always true. In economics, mathematics, and medicine, the relationship between the JIF5 and AI score is different than for ecology ([www.eigenfactor.org](http://www.eigenfactor.org) - see if can get reprint permission). It is possible that the relationship between the two metrics will change within ecology over time or for particular journals. The AI score currently suffers from some of the same limitations as the JIF5, including a limited, albeit large, database of journals, limited inclusion of citations from books, and free citations because not all communications are included in the number of published articles. However, given the conceptually superior calculation of influence throughout scholarly publications, I recommend scholars focus on the AI score rather than either the 2-year or 5-year impact factors.

Similarly, the Hi-norm???? may be of interest when deciding on publication venue because……..

---scopus???

The H-index was designed for evaluation of research influence. While it can be used to evaluate journal influence and has a reasonably high correlation to other influence metrics, it is more problematic for journals than for researchers. Researchers have limits to the number of articles they can publish. Journals on the other hand have vastly different publishing capacities and the number of highly cited articles, representing the H-index, is not necessarily representative of the general citation structure of the journal as a whole. A version of the H-index adjusted for the number of articles published is likely to better represent the interests of perspective authors. The current H-index is more representative of the total influence or prestige of a journal and therefore more comparable to the Eigenfactor. Therefore, the H-index in all it’s current forms, along with similar metrics (e.g. g-index, e-index) should remain a focus for author influence with potential for librarians and publishers interested total journal influence.

Additionally, citations and scholarly influence play a part in promotion and tenure decisions. Citation-based metrics as well as Altmetrics have limitations but they can be helpful in various evaluations of how ideas are transferred and maintained through both the scientific community and society at large…….This is why I recommend the Eigenfactor over other citation-based metrics. If the ideas or data presented in a paper are topical and exciting for a contemporary audience the paper may generate considerable citaitons and associated importance metrics including JIF and H-index. However, if the paper was more sensational than substantive, the sustaining power of the research might be limited. Age-dependent metrics such as the AW-index can account for this to a limited extent. If the memes generated by a paper are substantial, however, the Eigenfactor will better represent the spread of those ideas because it includes not only citations of that paper but also of the papers citing the original paper. The citation network explicit in the Eigenfactor represents the spread of a paper’s influence through the scientific community. Therefore, it is likely to be a better measure of importance and influence than the other metric considered herein.

Familiarity, complexity, and scale are the biggest challenges for moving scientists away from the JIF and to Eigenfactors and AI scores. The Journal Impact Facor has been part of the scientific lexicon for decades and most scholars are aware of its use even if they do not consider it as part of their publication process. The JIF is so ingrained in the scientific community that it is possible that the view of journal hierarchy within ecology is based as much on JIFs as it is on the content of the journal. Separating the two is impossible at this point. Even those scholars frustrated with the limitations of JIFs might have trouble with a paradigm shift to Eigenfactors because of the complexity of Eigenfactor calculation. Most researchers are not experts in network theory and may be confused by the calculation of Eigenfactors, making researchers dubious of the metric. Finally, the JIF is on a scale that is easy to remember and talk about. Journals with JIFs below 1 are generally smaller, specialty journals with lower reach and readership. Many good journals in the field of ecology fall in the range of 3-6 and the very top ecology journals are between 10 and 20. Eigenfactors for ecology journals, in contrast, range from 0.00014 - 0.08167. Although they represent the percent influence on scientific citations as a whole (i.e. all Eigenfactor scores sum to 100), these are not numbers that are easy to remember or discuss in casual conversations. Using a scaled Eigenfactor value might enable Eigenfactors to gain greater traction in the ecological community. Eigenfactors have a greater relative range than JIFs, allowing for greater separation of journals by network influence. Multiplying Eigenfactors by 100 to create and Eigenfactor index would allow ecology journals to range from 0.014 to 8.167, and top scientific journals such as Nature, PNAS, and Science would have an Eigenfactor-index of 165.5, 160.2, and 141.2, respectively. These are numeric values that would help increase the use of Eigenfactors by the scientific community. This is equivalent to all Eigenfactor scores summing to 10,000.

Relative values of scholarship: Alternative metrics that include influence beyond citations may have less correlation.

“At least for medical journals, it does not appear that iter- ative weighting of journals based on citation counts results in rankings that are significantly different from raw citation counts. Or, stated another way, the concepts of *popularity* (as measured by total citation counts) and *prestige* (as measured by a weighting mechanism) appear to provide very similar information.” (REF Davis 2008) – good reference to base part of my paper off of

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Table. Ranks of top 10 journals on a per article basis as indicated by the 5-year Journal Impact Factor, Article Influence score, SNIP, and SJR.

OR ordered by AI because that’s what I’m suggesting (but JIF more well known)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Journal | JIF5 Rank | AI Rank | SNIP Rank | SJR Rank |
| ANNU REV ECOL EVOL S | 1 | 1 | 2 | 3 |
| TRENDS ECOL EVOL | 2 | 2 | 1 | 1 |
| ECOL LETT | 3 | 3 | 3 | 2 |
| FRONT ECOL ENVIRON | 4 | 4 | 4 | 5 |
| GLOBAL CHANGE BIOL | 5 | 6 | 9 | 6 |
| ISME J | 6 | 7 | 19 | 13 |
| ECOL MONOGR | 7 | 5 | 5 | 4 |
| GLOBAL ECOL BIOGEOGR | 8 | 8 | 14 | 11 |
| MOL ECOL | 9 | 21 | 20 | 14 |
| B AM MUS NAT HIST | 10 | 9 | 7 | 28 |
| J ECOL | 11 | 14 | 10 | 7 |
| ECOLOGY | 12 | 10 | 13 | 8 |
| CONSERV BIOL | 13 | 15 | 11 | 18 |
| J APPL ECOL | 14 | 18 | 8 | 12 |
| P ROY SOC B-BIOL SCI | 15 | 12 | 21 | 16 |
| EVOLUTION | 16 | 13 | 27 | 9 |
| ECOGRAPHY | 17 | 19 | 26 | 19 |
| ECOL APPL | 18 | 16 | 12 | 17 |
| AM NAT | 19 | 11 | 23 | 10 |

Table. Journal ranks based on their total influence on scholarly thought as indicated by the citation-based metrics: Eigenfactor, H-index, AW-index, and total citations. The top 20 ecology journals based on Eigenfactor and H-index are shown.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Journal | EF\_Rank | H\_Rank | AW\_Rank | Cites\_google\_rank |
| P ROY SOC B-BIOL SCI | 1 | 5 | 6 | 6 |
| ECOLOGY | 2 | 7 | 4 | 3 |
| MOL ECOL | 3 | 6 | 1 | 1 |
| ECOL LETT | 4 | 2 | 5 | 5 |
| GLOBAL CHANGE BIOL | 5 | 3 | 2 | 2 |
| TRENDS ECOL EVOL | 6 | 1 | 7 | 7 |
| EVOLUTION | 7 | 11 | 9 | 9 |
| MAR ECOL-PROG SER | 8 | 18 | 15 | 11 |
| BIOL CONSERV | 9 | 9 | 8 | 8 |
| AM NAT | 10 | 13 | 16 | 15 |
| OECOLOGIA | 11 | 20 | 13 | 13 |
| ECOL APPL | 12 | 15 | 11 | 12 |
| CONSERV BIOL | 13 | 8 | 12 | 10 |
| J EVOLUTION BIOL | 14 | 27 | 20 | 20 |
| OIKOS | 15 | 28 | 23 | 22 |
| BIOL LETTERS | 16 | 25 | 19 | 19 |
| ECOL MODEL | 17 | 30 | 18 | 17 |
| J APPL ECOL | 18 | 12 | 14 | 16 |
| J ECOL | 19 | 16 | 21 | 21 |
| J BIOGEOGR | 20 | 19 | 17 | 18 |
| ECOL ECON | 21 | 4 | 3 | 4 |
| J ANIM ECOL | 22 | 26 | 26 | 26 |
| BIOGEOSCIENCES | 23 | 32 | 24 | 23 |
| FUNCT ECOL | 24 | 22 | 25 | 24 |
| ISME J | 25 | 10 | 10 | 14 |
| ANNU REV ECOL EVOL S | 26 | 34 | 52 | 52 |
| BEHAV ECOL | 27 | 45 | 36 | 36 |
| J EXP MAR BIOL ECOL | 28 | 41 | 28 | 27 |
| FRONT ECOL ENVIRON | 29 | 14 | 34 | 31 |
| BEHAV ECOL SOCIOBIOL | 30 | 46 | 33 | 34 |
| ECOGRAPHY | 31 | 40 | 38 | 39 |
| BIODIVERS CONSERV | 32 | 36 | 29 | 28 |
| ECOSYSTEMS | 33 | 29 | 42 | 41 |
| HEREDITY | 34 | 35 | 39 | 38 |
| GLOBAL ECOL BIOGEOGR | 35 | 17 | 37 | 37 |