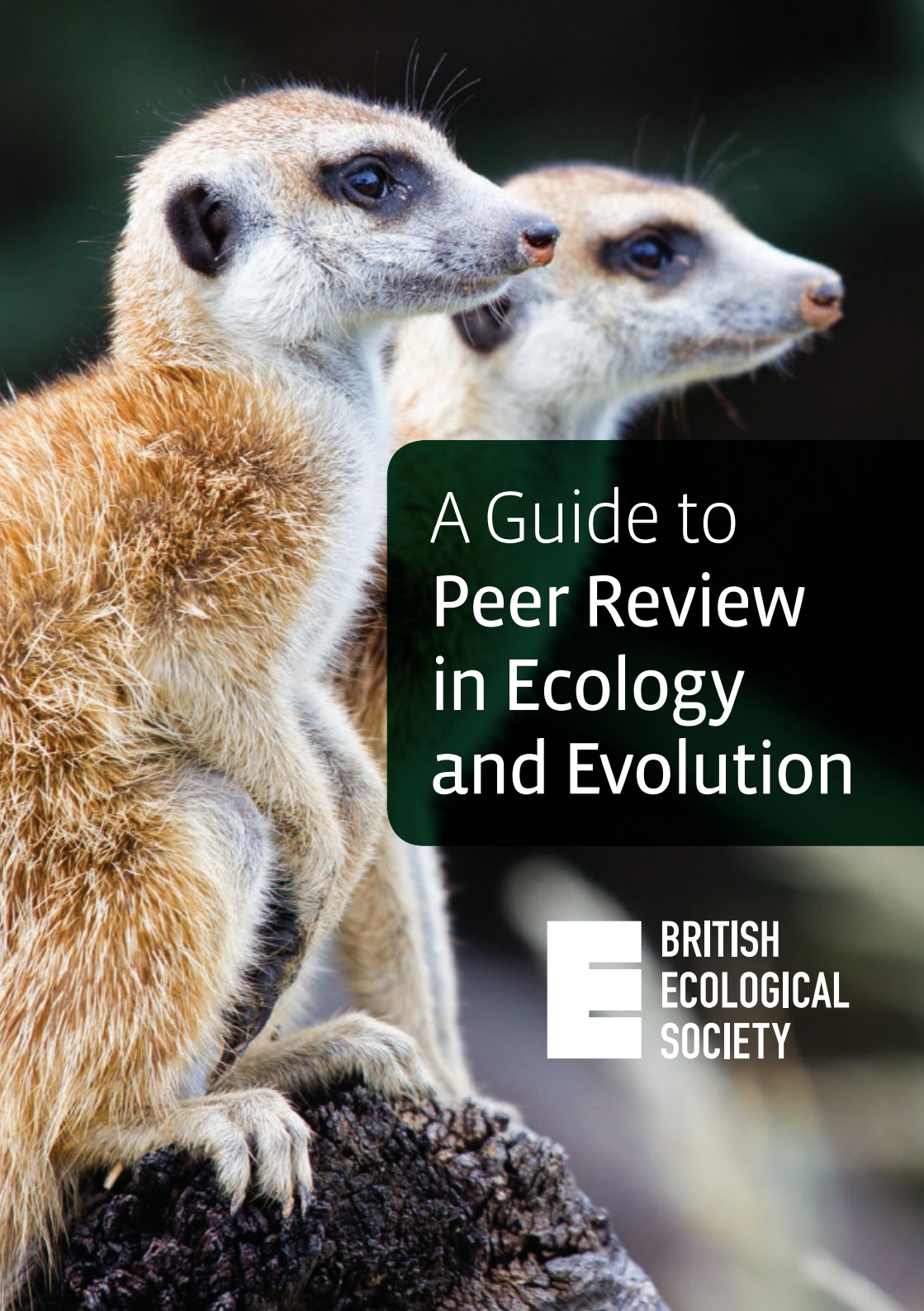

A Guide to **Peer Review in Ecology and Evolution**

BRITISH ECOLOGICAL SOCIETY

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Journal of Applied Ecology

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Journal of Ecology

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Preface

The British Ecological Society, the oldest ecological society in the world, has been publishing scientific journals since it was first formed 100 years ago. The first issue of *Journal of Ecology* was published in time for the Society's inaugural meeting on 12 April 1913. Since then, four further journals have been added to the Society's publishing portfolio: *Journal of Animal Ecology* in 1932, *Journal of Applied Ecology* in 1964, *Functional Ecology* in 1987 and *Methods in Ecology and Evolution* in 2010.

The Society has published over 20,000 research articles, including 3,259 articles in the last 5 years alone, and whilst the total number of reviewers who contributed to the assessment of these articles is unknown, during 2012 it was over 3,000. Therefore countless ecologists have helped authors improve these articles and support our editorial teams in assessing what should be published in the Society's journals.

Peer review has been providing a valuable service to the scientific community since it was first employed in 1665 by the Royal Society's *Philosophical Transactions of the Royal Society*, and its value is very difficult to measure. A published peer-reviewed article will have been through a rigorous process of evaluation by experts, and on this basis is given a stamp of authority. The integrity of the scientific literature rests on a peer review system that is robust, independent and fair. Most researchers accept the peer review process (and the work involved in it) because – whilst it is not a perfect system – it has proven to provide real benefits to both authors and the reviewers themselves. Authors benefit significantly from the feedback they receive from their peers, not only in the correction of errors made and development of the article itself, but also by the inferred approval that a positive peer review of an article provides. Authors generally consider it their duty to serve their research community by giving up time to review their peers' work.

Evaluating another researcher's work hones critical thinking skills, it provides insights into topical work being conducted, it builds a broad knowledge of different experimental methods and data analyses and it helps develop an understanding of the positives and negatives in the way science is presented. This all feeds into the quality of a reviewer's own article preparation which provides an on-going cycle of improvement to the body of scientific literature being published. Reviewing also helps develop sensitivity towards others, especially if the review is conducted collegially rather than combatively.

Reviewing is a skill, one that is learned through practice and experience and there are real benefits to becoming a reviewer, in terms of both personal and professional development. Researchers, who enjoy reviewing articles, provide constructive feedback to authors and show an aptitude for identifying papers ready

Preface *continued*

for publication, are often invited to join journal editorial boards. Such engagements can make a major contribution to the individuals' career progression and success with grant proposals. Some editorial board members then go on to become editors, which demonstrates a significant personal commitment to a journal, the peer review process and science publishing. These appointments are highly regarded by the scientific community.

This booklet is intended as a guide for early career researchers, who have little or no experience of reviewing journal articles but are interested in learning more about what is involved. It provides a succinct overview of the many aspects of reviewing, from hands-on practical advice about the actual review process to explaining less tangible aspects, such as reviewer ethics.

We hope it encourages you to review!

Andrea Baier *and* ***Liz Baker***
Managing Editors
British Ecological Society

Introduction to peer review

What is peer review?

Peer review is the evaluation of scientific articles by other scientists who are expert in the field. It is an essential part of the scholarly publication process. Most journals rely on scholarly peer review to help editors assess the quality of articles submitted to their journals.

There are over 12,000 journals indexed on the ISI Web of Science and these capture 95% of scholarly citations[1]. The journals listed have recognised standards of peer review that provide the literature published with a degree of authority. In most instances the reviewing of articles is an unpaid voluntary activity and conducted in the reviewer's own time.

Why peer review?

Within scholarly publishing it is important for readers to be confident that the article they are reading has been checked for its scientific validity and to be reassured that the article has reached a quality level that justifies their faith in taking time to read it. Whilst not a perfect process, it is generally accepted that peer review

- improves the quality of articles that are published;
- provides an assessment of the science in the literature;
- assists the editorial decision-making process; and
- acts as a gatekeeper for unethical practice.

Most academics, throughout their careers, will peer review articles, and institutions often take the activity into account when assessing those applying for academic positions, tenure or promotion. For young scientists, acquiring the skills necessary to conduct good and authoritative reviews that are helpful both for editors and authors is considered to be an important part of their career development. Many see this work as a service to their scientific community and an important way in which they can contribute to raising the profile of the area of science within which they work.

[1] Adams, J. (2011) Global Research Report United Kingdom. Evidence, Thomson Reuters, Leeds. http://researchanalytics.thomsonreuters.com/m/pdfs/globalresearchreport-uk.pdf accessed 5 July 2013.

Introduction to peer review

ISI Category	Number of journals listed*	Number of articles published*
Biodiversity Conservation	40	3,290
Ecology	136	15,612
Evolutionary Biology	47	5,481
Plant Science	195	19,105
Zoology	149	11,019

Table 1. Numbers of journals listed and articles published in a set of ISI subject categories in 2012. *Some journals are listed in more than one category

Who should peer review?

Peer review provides a valuable service to science, it should be carried out by those suitably 'qualified' to do so. This expertise can come from many years' of academic and research experience in a subject area, it can come from in-depth study in a specific area during a PhD and it can come from practical experience in the field. Editors often select reviewers who have recently published articles on a related subject to the article under consideration.

How does peer review work?

The most widely used, traditional form of peer review involves the article being submitted to a journal and entering a process whereby it is assessed by a combination of editors and reviewers, resulting in a decision that may or may not lead to publication. For many journals, particularly those ranked highly in the field, less than 20% of manuscripts submitted are eventually accepted for publication. Articles published in these journals are selected based on scientific merit, quality and novelty. Many of these articles are declined as a result of the reviewers' and editors' assessment of their novelty; however, many are still good articles – just not good enough for the targeted journal. Articles not accepted at a journal will usually need to start the submission and peer review process again at a different journal, when some of the same reviewers may be invited to review the paper by a different editor. There are some journals that conduct traditional peer review selecting the articles they publish based only on the quality and ethical standards of the science, but not on the importance of the work, e.g. *PLOS ONE*.

Reviews are typically not shared between journals; however, some societies and

publishers have set up cascade journals where reviewer comments are passed on to (see Cascading peer review).

There are three types of traditional peer review:

- Single-blind peer review – a system where authors do not know who reviewed their article unless reviewers choose to waive their anonymity by signing their review
- Double-blind peer review – a system where both authors' and reviewers' identities are hidden from each other
- Open peer review – a system where the identities of the authors and reviewers are known to all parties

Single-blind peer review
Methods in Ecology and Evolution, Journal of Animal Ecology, Journal of Ecology, American Naturalist, Ecology

Double-blind peer review
Behavioral Ecology, optional in *Nature Geosciences* and *Nature Climate Change*

Open peer review
F1000Research, eLife, PeerJ (encouraged)

Box 1. Examples of journals following each type of traditional peer review

Other forms of peer review:
Cascading peer review is a system whereby journals use the traditional peer review model but refer some articles that are declined for publication to another journal. If the authors agree, reviewer and editor comments are forwarded to this second journal along with the article. A formal arrangement to allow this to happen will have previously been established between the participating journals and reviewers are made aware that their comments might be used by a second journal; e.g. *Ecology & Evolution, Nature Communications*.

Third-party peer review services are offered by some organisations. Rather than submitting their article to a specific journal, authors can send their article to an independent organisation that arranges peer review and charges either the authors or the journals that go on to accept the reviewed article, e.g. *Peerage of Science, Rubiq*.

Introduction to peer review

Post-publication peer review platforms offer immediate article publication with post-publication peer review. For example, *F1000Research* posts submitted articles that pass a very basic check online and invites peer review comments after publication. Submitted reviewer comments are then posted alongside the article. Articles that eventually gain 'approved' status are then indexed, amongst others, in PubMed Central, Scopus and Google Scholar.

Preprint servers provide an online facility where articles can be posted online in advance of peer review. Popular in fast-moving areas of research, preprint sites allow authors to receive early feedback from their peers. Whilst these websites offer immediate online posting of research articles, they do not offer peer review. However, peer feedback is commonly used to assist authors to revise their articles in preparation for journal submission, e.g. *arXiv* and *PeerJ PrePrints*. Not all journals consider articles for publication that have previously been posted in preprint servers.

Box 2. Article feedback before submission

Who does what?

The structure of editorial boards and the job titles of their members differ widely between journals and so does the way in which editors and editorial board members collaborate to reach decisions on submitted articles. Figure 1. outlines the basic peer review workflow and the tasks assigned to those participating in the peer review process. More than one iteration of the revision workflow might be needed before a final decision is reached.

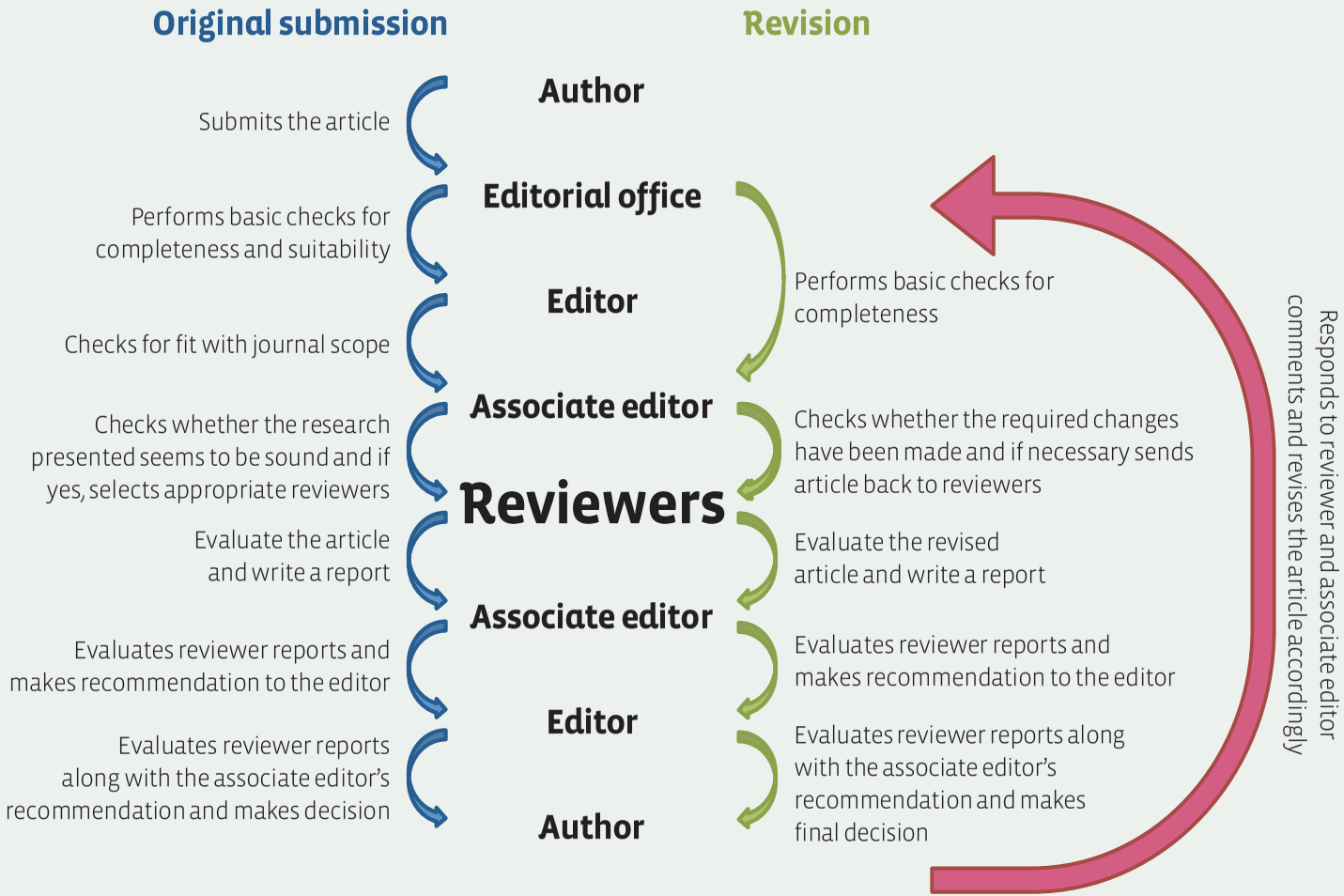

Fig. 1. Peer review workflow and roles.

Introduction to peer review

Editor

The primary role of a journal editor (also referred to as editor-in-chief, executive editor or senior editor) is to manage the strategic direction of the journal and take responsibility for the articles published in it. This includes making the final decisions on articles that have been submitted. Decisions are made using a number of considerations including:

- aims and scope of the journal;
- associate editor recommendation;
- reviewer comments;
- other articles recently published in the journal;
- journal priorities; and
- journal page budgets.

The editors also take responsibility for balancing the workloads of the editorial board, appointing associate editors and resolving any conflicts that arise during the peer review process.

Associate editors

Associate editors (handling editors or subject editors) make up the editorial board. Their responsibilities are to:

- make an initial expert assessment of the article assigned to them;
- select appropriate reviewers;
- scrutinize the reviewers' comments;
- provide their own assessment of the article with suggestions for improvement and guidance on the importance of the reviewer comments;
- judge the merits of publishing the article in the targeted journal using the expert feedback from the reviewers;
- make a recommendation to the editors regarding the final decision that should be made on the article; and
- support the editors in promoting the journal within the scientific community.

Introduction to peer review

Reviewers

Reviewers (referees) are subject area experts who are asked to evaluate an article. Their responsibilities are to:

- provide a detailed, objective report on the merits of an article;
- identify flaws in the design of the research, and in the analysis and interpretation of results;
- highlight ethical concerns;
- comment on the appropriateness of the literature cited; and
- offer their view on the suitability of an article for publication in the journal to which it has been submitted.

Editorial office

At the heart of each journal is the editorial office. A journal will typically have a managing editor and an editorial assistant or assistant editor, although the number of staff can differ between journals, and especially if a journal is owned by a large publishing house, managing editors and editorial assistants often are responsible for more than one journal. The editorial office usually manages the peer review process on behalf of the editors by:

- checking that article files are complete and the content has been structured according to the author guidelines for the journal;
- providing a central contact for all enquiries throughout the process;
- giving essential feedback to all parties so that the publication experience is as straightforward as possible for authors and reviewers;
- providing publishing advice to the editors;
- handling correspondence, including some decision letters; and
- ensuring that copy provided for publication is prepared in house-style, with complete content and files.

In addition to managing the peer review process the editorial office is sometimes also responsible for putting issue content together, driving marketing initiatives and – together with the editor – for the strategic development of the journal.

Best practice

Invitation

When invited to review an article there are a few key questions to consider before accepting the invitation:

- Does the subject area of the article match my expertise?
- Do I have time to review within the timescale requested by the journal? Many journals ask for articles to be reviewed within 2-3 weeks, although others request shorter turnaround times. Be realistic!
- Do I have any conflicts of interest that might prohibit me from reviewing the article objectively? (See also Publication ethics.)
- Do I actually want to review this article?

If there are any reasons for declining the invitation respond straight away. It is OK to say no, and better – for you, the journal and the authors – than not replying to an invitation or committing only half-heartedly, procrastinating over the review and submitting it late or not at all.

If you want to review the article, it is important to commit the time needed to make it a thorough review. Should you find circumstances arise whereby your review will be late or you are no longer able to honour your commitment, inform the editorial office at your earliest opportunity.

Best practice

Basic principles

Having agreed to review there are some basic principles to follow:

- Always treat the paper with the utmost confidentiality
- Take an objective, independent approach to the work, putting aside subjective feelings about the topic and the authors, if known to you
- Be attentive to the task as your report will influence the decision on the article, which may have an impact on the career of the author(s) or the reputation of the journal
- Your role is to improve the science in scholarly publications and critical scrutiny of the article is essential
- Provide evidence, where appropriate, for the statements you make in your report
- Be careful when writing a report to use simple language so that authors can understand your comments, even if English is not their first language
- Always conduct the review professionally, courteously, collegially and politely
- Never contact the authors directly; all correspondence should be via the editorial office

How to get started

If you have not reviewed for a particular journal before, read the aims and scope of the journal and consult the reviewer guidelines. Also look at the form the journal asks reviewers to complete to find out which questions you are expected to answer and the specific issues that you are being asked to comment upon.

The majority of your report will be free-text comments to the authors and confidential comments to the editor.

Before looking in detail at each section in the article, *read it from start to finish*: this will give you an overview and provide a clear understanding of everything the article covers.

Writing the report

Overview comments

After reading the article it is useful to ask yourself the following questions:

- Is there a clear and valid motivation for the study?
- Is the research question/hypothesis/prediction of the research clearly presented?

- Does the research follow logically from prior knowledge? Is it timely, and does it have the potential to advance the field?
- Is the article appropriately structured and clearly presented?
- Can you easily summarise the key message in the article?
- Does the title reflect the contents and is it engaging?
- Does the article fit with the scope of the journal that has asked you to review it?
- Does it take account of relevant recent and past research in the field?
- Is there significant overlap with material that has previously been published?

Your answers to these questions should form the opening comments in your report.

Detailed comments

Most articles are structured into sections commonly labelled 'summary/abstract', 'introduction', 'methods', 'results' and 'discussion'. There may also be a 'conclusion'. It is recommended that you take a methodical approach to assessing the article by appraising each section in turn. In your comments remember to provide evidence for the statements you make, whether positive or negative.

Summary/abstract

- Is it concisely written?
- Does it provide a clear overview of the work?
- Does it contain the essential facts from the paper?
- Does the final point place the work described in a broader context, highlighting its significance?

Introduction

- Does this provide a clear, concise background to the study?
- Does it enable you to understand the aims of the study and hypotheses questions the authors are exploring?
- Have the authors elaborated sufficiently on the context in which the work is set?
- Has the motivation for the work been adequately explained?
- Is there satisfactory citation of prior literature?

Best practice

Methods

- Is the methodology sound?
- Have the procedures followed been sufficiently described?
- Is there enough detail here for the study to be replicated?
- Is it clear what was recorded and which units of measurement were used?
- Are the statistical design and analyses appropriate?
- Have important details been left out?
- Where appropriate, has ethical approval been obtained for the work?

Results

- Are the results provided in a form that is easy to interpret and understand?
- Have results for all the questions asked been provided?
- Are the data of sufficient quality and quantity?
- Are the figures and tables appropriate?
- Have the correct units of measurement been used?

Discussion and conclusions

- Have the authors answered their research question(s)/hypotheses?
- Are the conclusions drawn from the results justified?
- Has the significance of the study been fully explained?
- By how much has this study advanced the current understanding of the science?

Best practice

Summary points

- Be objective
- Include details of what is good about the article, but also highlight any problems
- Look for the novelty and importance of the work
- Recognize that no study is perfect
- Be constructive
- Be thorough and thoughtful
- Evaluate both the quality of the ideas and experimental details/results
- Be specific and factually accurate
- Recognize opinion versus fact
- Be civil

Box 3. Summary of key principles of reviewing

Best practice

Post Review

- Whenever possible agree to journal requests to review revisions or resubmissions of articles you have previously reviewed. This helps provide consistency of view and you are best placed to determine whether advice has been followed.
- Do not include anything that appears to be a decision about the paper in your comments to the authors. The decision is made by the editors who need to consider many criteria when deciding which papers to accept and reject.
- As a courtesy to reviewers, most journals will copy the other reviewers' comments to you. From these you will learn how different people review papers and read comments about issues that you may have missed.
- The journal will never reveal your identity to authors without your permission. However, if you have signed your review and a dispute arises about a decision on the article that you have reviewed, you should not enter into discussion with authors, but advise them to contact the editorial office. The journal will follow best practice guidelines (e.g. those provided by the Committee on Publication Ethics (COPE)) in dealing with difficult and delicate situations. Journals do not handle disputes over decisions often.

Appeals

Although appeals are not common, authors can request that a journal reconsiders a decision to reject an article. Appeals can often be dealt with by the editor and the associate editor, but in rare cases where the appeal hinges upon technical details, the editor may approach reviewers for further comments.

Box 4. Providing feedback on appeals

Ethics in peer review

Confidentiality

In the traditional peer review model, you are bound to confidentiality about the work you have been asked to review. You must not take ideas presented in articles you evaluate and pass them as your own and you must not disclose any data presented in the article before it has been published. It is acceptable to ask a colleague for advice as long as the authors' names are not revealed and unnecessary details remain confidential.

Bias

When commenting on someone else's work, it is hard to be completely neutral. However, whilst the journal editors want you to be neutral about the quality of the science, they still want to know your view of an article. Nevertheless, your opinion should be based solely on the presented work and not on any prejudices you may have. In science publishing you are advised to be sensitive towards the risk of bias in particular:

- **gender bias**: the possibility that articles by authors of either sex will be subject to different standards of review
- **geographical bias**: the concern that the authors' country of origin will influence the manner in which their work is assessed
- **seniority bias**: the possibility that articles by authors at different stages in their careers will be subject to more or less favourable review
- **confirmation bias**: the concern that articles reporting controversial results or putting forward new, revolutionary ideas will be less favourably reviewed than articles that do not challenge conventional wisdom

Being aware of these possible biases and checking whether your opinion about an article may have been influenced by them are important first measures you can take, regardless of the peer review system a journal employs.

Several articles have been published that either discuss these biases in different journals and subject areas or that report on experiments in which different peer review models have been used.

Although some journals have adopted open (*PeerJ, eLife*) or double-blind reviewing practices (*Behavioral Ecology*, optional for *Nature Geosciences* and *Nature Climate Change*), the majority of journals continue to use single-blind peer review.

Ethics in peer review

Publication and research ethics

If you are concerned that publishing ethics may have been violated in connection with the article you are reviewing, or if you are worried that research ethics may have been breached, you should notify the editorial office.

Most journals have set procedures for dealing with ethical concerns and will be able to investigate such concerns further without you having to reveal your identity to the authors or even become involved personally.

Duplicate/multiple submission and publication

- Submitting an article to various journals concurrently, before a decision from the first journal has been received or submitting considerably overlapping material, especially results, in different articles to different journals.
- Duplicate publication is a potential consequence of multiple submission; editors are unaware that an article is considered by other journals at the same time and more than one journal accepts and publishes the same article or one with considerable similarity.

Authorship

Authorship is usually granted to those who have substantially contributed to the work presented in an article.

- Unjustified authorship: gift, honorary or guest authorship is authorship assigned to people who have not made substantial contribution to the conception and design, acquisition of data, or analysis and interpretation of data; drafting the article or revising it critically for important intellectual content; and final approval of the version to be published.
- Ghost authorship: where those who have substantially contributed to authorship of the paper are omitted from the list of authors on the article. This is especially problematic when co-authors deliberately exclude colleagues who fulfil authorship criteria.

Conflict of interest

- Conflicts of interest that prevent a reviewer from impartially evaluating someone else's work.

Box 5. Examples of problems with publication ethics

Ethics in peer review

Fabricated data
- Data that are made up rather than the result of actual measurements.

Falsified data
- Data stemming from measurements that have subsequently been unjustifiably altered in order to yield more impressive/convenient results.

Stealing data
- Using someone else's data without their consent.

Animal welfare practices
- Codes of conduct that need to be adhered to when carrying out research that involves animals or protected species of any kind.

Box 6. Examples of problems with research ethics

All reviewers should take responsibility for reporting concerns regarding unethical practice, and it is the duty of the journal editorial offices to investigate issues that are highlighted during the peer review process.

Frequently asked questions

How does an editor make a decision?
After the editorial office has received the required number of reviews, the associate editor reads the article and the accompanying reviewer comments, and will recommend a decision to the editor. The recommendation is not a vote-counting exercise of mixed reviews. This means that a majority of views in favour of acceptance or rejection will not necessarily lead to that decision being made. Associate editors will provide their own opinion regarding the decision to the editor and may also give advice on which of the reviewers' suggestions need to be followed.

In making a decision, the editor is guided by the reports from the reviewers and the associate editor. The editor usually does not read the entire article, but may examine sections of it in more detail to form his or her own judgement if there is disagreement between the reviewers and the associate editor.

Most journals inform the reviewers of the decision and share the reviewers' comments with all reviewers of the article. If the journal you are reviewing for does not follow this practice and you would like to see the other reports, request them from the editorial office. The other reviewer reports can help you understand why a particular decision has been made.

Why has the editor disagreed with my evaluation?
The role of the reviewer is mainly to judge the soundness of the science and to assess the quality of the work in the context of the existing literature in a particular field.

Frequently asked questions

Sometimes reviewers' opinions about an article may differ and the editor's decision may thus not reflect your recommendation, because:

- you have overlooked a (serious) flaw in the article that other reviewers have identified;
- other reviewers may have judged the importance or novelty of the work differently;
- the article does not meet the standard required by the journal;
- the work presented in the article is not of sufficient interest to the journal's core audience;
- the work is not novel enough for the journal;
- you may have advised that additional work needs to be done or judged the work to be of insufficient importance, whereas the editor is prepared to accept the article as it is.

It is important to remember that although you are asked your opinion about an article, the final decision about publication or rejection lies with the journal. The better-argued your views are, the more likely it is that they will they hold up against someone else's opinion and the more useful they will be to an editor who needs to make a decision on the basis of conflicting advice. Should you feel very strongly that a decision is wrong, especially if you are concerned that a fatal flaw has been overlooked, contact the editorial office so that the decision can be revisited and, if appropriate, revised.

Is reviewing a revision different to reviewing the original submission?
On submitting a revision, authors are expected to provide a point-by-point explanation of the way in which they have responded to reviewers' comments when they submit their revision. If you have reviewed the article before, check whether the points you raised have been addressed, but also judge the revision afresh. You may not have spotted certain issues in the original submission, new mistakes may have been introduced in the revision, or some previously unseen problems with the article may only have become apparent in the revision.

Do reviewers need to know whether an article will be published open access?
No. In fact, in hybrid journals, i.e. subscription journals with an open access option, authors only have to declare after acceptance whether they wish to make their article open access. Therefore, the decision to accept or reject is not influenced by the consideration that an open access article brings revenue to the journal.

Frequently asked questions

Can I pass a review request on to one of my students?
If you are an established, well-known scientist you will typically receive more invitations to review. You may be unable to agree to all requests. If a young colleague in your lab happens to be an expert on the subject matter of the article you have been invited to review, it is perfectly fine to either:

- decline the review invitation, but suggest your student or post-doc to the journal as an alternative reviewer; or
- use this as a mentoring opportunity and have the article reviewed by one of your students, but under your supervision. It is crucial, however, that you inform the journal in advance of your intention and seek their consent. You should also carefully check your student's review and ensure that you are happy with their comments before you return them to the journal. Make sure to include your student's name so they get the credit they deserve. If the student does most of the work, the review could be submitted under his/her own name.

Can I review with my supervisor?
This is a good way of practicing reviewing with the safety net provided by your supervisor. When discussing the article you will learn the important points to look out for, and develop ideas of your own on how best to review.

Can I ask for advice on a review?
Even the most experienced reviewers can get stuck with a particular aspect of an article, for example, the statistical analyses. In such cases, it is acceptable to ask a colleague for advice, as long as you do not disclose the authors' names and you keep any unnecessary article details confidential.

What do I need to know about data archiving?
A growing list of journals in ecology and evolution recommend (e.g. BES journals, *Ecology, Ecological Applications, Ecosphere*) or mandate (*American Naturalist, Molecular Ecology, Journal of Evolutionary Biology, Ecological Monographs, Evolutionary Applications*) that data associated with an article be archived in a publicly accessible repository. Depositing the data underlying an article is usually only required once a decision about publication has been made. Most journals allow embargo periods to be agreed with authors where the data is associated with other articles in preparation. Some authors will make their data available at submission, for example in the supplementary material files for their article.

Frequently asked questions

Do I need to know whether data will be archived?
No. Data are not normally archived until an article has been accepted and thus are usually not accessible to the reviewers. Where archived data are available, you may wish to inspect them when you review an article, but reviewing the data is not part of your duties as a reviewer unless stated otherwise by a journal. At the time of writing, only *Molecular Ecology* required data review alongside article review.

What do I do with supporting information or supplementary files?
Supporting information or supplementary files are made available to a journal at submission, but most journals do not expect them to be reviewed. Although the files do not form part of the published version of record of the article, they are usually posted online with the article upon publication or archived in data repositories. You can, of course, consult the information provided in this section for further understanding of the article, or you may suggest that some information from the actual article be moved to supporting information. You may also request that additional information be made available in this section, but the main article should contain everything that is needed to support the main conclusions made.

Is reviewing for an open access journal different to reviewing for a subscription journal?
Some open access journals, such as *PLOS ONE*, only require you to comment on the scientific and ethical integrity of the work and on the clarity of the presentation, while most traditional subscription journals ask you to also pass judgement on the importance or novelty of the work under review.

However, not all open access journals have the same criteria for publication: while *PLOS ONE* may publish any article that meets its editorial criteria, its sister journals *PLOS Biology* or the new journal *eLife* are highly selective and want you to judge an article's importance as well.

It is important to familiarise yourself with journal guidelines, whether reviewing for an open access or traditional subscription journal.

Should I apply different standards when reviewing for different journals?
Although your main role as reviewer is to judge the science presented in an article, you should also keep in mind a journal's aims and scope and the quality of articles you expect to read in the journal in question. For example, case studies might be acceptable for one journal, but not for another. Similarly, an article might be of utmost interest and importance for researchers in a particular subfield, but the journal for which you are reviewing may have a more general remit and not allow

authors to present as much detail as would be useful for a specialist audience.

It is good practice to state whether or not (and why!) you would expect an article such as the one under review to appear in a particular journal and to support your opinion with reasons. This is best done in the comments to the editors.

How much time should I spend on a review?

How long it takes you to review an article depends on many factors:

- How familiar you are with the topic
- Your experience as a reviewer
- The clarity of the presentation in the article
- The difficulty of the subject matter
- The length and type of the article

A survey[2] of reviewers of manuscripts submitted to the *BMJ* found that review quality increased with time spent on a review up to 3 hours but not beyond. This might be considerably more or less in other subject areas, but it is advisable to set aside 3-5 hours for the task, although time spent will vary depending on the type and length of article.

Box 7. Reviewing time guideline

Although generally you will only be asked to review articles that pass the associate editor's initial assessment, occasionally it will quickly become apparent that an article is of insufficient quality to justify a detailed review. If you notice grave and consistent problems throughout an article, indicate this in your reviewer comments, but do not feel obliged to spend significant amounts of time correcting errors that the authors could not or did not care to correct themselves in advance of submitting the article to the journal. You may want to be more lenient, however, with inexperienced authors or someone who does not have English as their first language.

Do I need to correct the language in an article?

If there are significant language problems in a text, please flag this in your comments so that the authors (native and non-native English speakers!) can be asked to improve this aspect of their article. You could edit a paragraph or two to highlight the kind of

[2] Black, N., van Rooyen, S., Godlee, Smith, R. & Evans, S. (1998) What Makes a Good Reviewer and a Good Review for a General Medical Journal? JAMA, 280, 231-233.

mistakes that need to be corrected or to point out specific examples, but you should not feel it necessary to copyedit the manuscript yourself.

How different should the confidential comments to the editor be from the comments that the authors will see?

Confidential comments to the editors should not be significantly different to the comments to the authors. The overall message of both should be the same: if you only have minor comments to the authors with few suggestions for change, do not then condemn the article in your comments to the editors.

However, statements regarding whether or not an article should be published in the journal should only be made in the comments to the editor.

What should I do if I have already reviewed the same article for a different journal?

If you agree to review an article for a journal that you have already reviewed for a different journal, check whether the authors have taken your original suggestions on board. If they have, provide comments on the new, revised article. If they have not and the article is completely unchanged, let the editorial office know and either send your original comments or a summary of what your concerns were when you first reviewed the article.

Conclusion

In the Sense about Science Peer Review Survey 2009[3], 95% of those questioned about peer review in the Earth & Planetary/Environmental Sciences subject category agreed that the peer review process improved their article. It is evidence like this that supports the value that peer review contributes to published articles.

As a human endeavour peer review does have its weaknesses; however, no other system has yet been devised that can deliver the widespread improvements to the body of scientific literature in a better way.

The overall conclusions of the Sense about Science survey show that contributing to the peer review process is viewed as an important part of playing an active role in the scientific community. Hopefully, this guide will encourage you to review, if you have been reluctant to do so. If you are already an active reviewer, it should answer some of the questions you have always wanted to ask but never had the opportunity to.

[3]Sense about Science. (2009) The Peer Review Survey 2009
http://www.senseaboutscience.org/data/files/Peer_Review/Peer_Review_Survey_Final_3.pdf (accessed 05 July 2013)

Further reading

COPE guidelines http://publicationethics.org/

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