How to Write Ecology Research Papers

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221 PUBLICATIONS   **11,331** CITATIONS

Griffith
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Environmental Futures Centre

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Background

Griffith University, along with others, is increasingly focusing on publications including by PhD students. There is lots of research showing that the better your publication record the better your chance of employment and promotion. There is also research showing that publication workshops increase publication rates for early career researchers (McGill et al. 2006). Those attending these types of courses often report feeling empowered and more confident in their abilities after completing them (Lee and Kamler 2008; McGill et al. 2006). They can also be fun, so do consider doing one of these courses.

Here are the workshop notes that were used in the Environmental Futures Centre for a course on writing research papers focusing mainly on ecological papers. Much of the content can also be applied to other disciplines. They can also save a lot of time for students and supervisors by covering a lot of general material so that meetings can focus on the content specific issues. If there is demand, Environment Futures Centre might be producing different versions of these notes to cover related disciplines such as social science, chemistry etc. The workshop consists of a series of two hours workshops each focussing on a particular aspect of writing a paper with background material followed by exercises for students to do.

To make best use of the course, and the notes, students should use a research paper in their own discipline area as an example. During the course they can then deconstruct (love that language !) the paper to see how it was structured and to cross check for any discipline differences from these notes.

Topics covered in these notes and in the course include.....

Why publish
How to choose a journal
   Which journal to use and why? – Impact factor, relevance and likely audience
The golden thread
- Working out what is the most important story you can tell with your results –e.g. what is the aim of the paper and the conclusions?
- How to conceptualise the argument in the paper including using mind mapping software.
- Common structures of research papers and the order in which they are written.
Introduction
- Series of paragraphs that carefully layout your argument leading to your aims!
- How to turn interrelated topics into to a single line of argument.
Methods
- Sections: context, study site, social sciences, field or lab work, data analysis
- Methods appear easy to write but actually requires work to make sure it's clear.
Results
- Tables and figures: They are a lot of work but it's worth getting them right from the start.
- Structure of the text: what goes in and what stays out and how to present the results clearly.
Discussion
- How to relate your work back to the literature highlighting its importance.
Conclusions and Acknowledgements
- Conclusions is the main result(s) and why they are important – e.g. the implications
Acknowledgments

- Keep them short, focused and unemotional.

Referencing
- Why supervisors and editors get frustrated when there are missing references and they are not formatted correctly.

Abstract
- It's usually the last thing you write and it's not the aims but a summary of everything.
- It's the part you might rewrite the most often.

Drafting and redrafting
- What's the point of each draft and why there can be so many of them?
- First draft – getting ideas down
- Second draft – working out better wording and flow
- Third draft – checking it's all there
- Drafts for supervisor/co-authors
  First/second draft– you want them to assess – does it make sense, is it complete (or too much), is it logical and well argued, have I pitched it right?
  Next draft for co-authors/supervisor – is this better and am I getting there?
- Draft for someone else to read
  First draft for others – what do you think as a reader new to my work? – does it make sense, is it complete (or too much), is it logical and well argued, have I pitched it right?
- Final draft – proof reading the final version so the formatting is correct, references are complete and there are no typos to annoy the reviewers.

The submission process
- Challenges of online submission

Reviewers comments
- The third review and the five stages of grieving (denial, anger, bargaining depression and finally acceptance).
- Using reviewer's comments to improve the paper and thesis.
- Responding to reviewers comments.

A starting thought

"Don't get it right, just get it written" (James Thurber, American humourist).

Writing a paper can seem an overwhelming task, particularly at the beginning. One aim of this document is to break down this process into a series of easier to follow steps. Another is to make the process more transparent. But remember, the greatest barrier to writing is a blank page. Once words on the page (or mind-mapped), they can be worked with: re-edited, reordered and reworded. Words in your head remain there. So get it down on paper, even if the order is wrong, the ideas are confused, the grammar is awkward and it is repetitive.

Why publish?

There is a wide range of benefits in publishing for students, supervisors, the University and the community.

Big picture benefits for you include

- increases research opportunities
- improves competitiveness for scholarship
- improves grant success
- garner awards
- secure permanent employment

Immediate benefits for you include

- Sense of achievement during candidature
- Improved motivation
- Turns big thesis into discrete papers/chapters
- Make mistakes on smaller components of research earlier in thesis
- Obtain feedback from different people
- Benchmark the quality of your work

Supervisor benefits as well including

- a better return for effort
- co-authorship
- spreading supervision workload
- faster student completion.

As do Universities...

- more publications sooner
- greater return for investment of money, time, and resources in PhD students

But publishing is not a bed of roses

Disadvantages to publishing papers

1. Not all fun. Anxiety including feelings of being judged rejected by reviewers
2. Additional work
3. Long time to publication....months to years !

How to choose a journal?

The first step in actually writing a paper is to select the journal. This is often done in conjunction with working out the Golden Thread (next section).

Some common factors to consider when selecting a journal are (1) what is its standing in the discipline, (2) is my research relevant to the journal and (3) are the readers of this journal the right audience for this material?

1. **What is the standing of the journal?**
    There is a range of ways of assessing the standing of a journal. In Australia at the moment they include:
    a. Impact factor. This is the average number of citations of recent (usually last two years) papers in that journal, averaged for all papers recently published in the journal. Usually it is calculated over a relatively short period (2 years) so it tends to favour journals with fast turnaround times, hence journals are increasing publishing articles on line before they are published in hard copy and many journals are now on-line only. Impact factors can be obtained from the ISI Web of Knowledge.

    b. Excellence in Research in Australia (ERA) ratings. This was a method developed by the Australian Government to use to rank journals across disciplines. It has its own oddities including ranking journals with very different impact factors as similar. Although it's talked about in Universities it's no longer directly used by the Australian Government. Below are the details of the ranking system from the Australian Government website.

        "Quality of the papers
        A* = Typically an A* journal would be one of the best in its field or subfield in which to publish and would typically cover the entire field/subfield. Virtually all papers they publish will be of a very high quality. These are journals where most of the work is important (it will really shape the field) and where researchers boast about getting accepted. Acceptance rates would typically be low and the editorial board would be dominated by field leaders, including many from top institutions.

        A = The majority of papers in a Tier A journal will be of very high quality. Publishing in an A journal would enhance the author's standing, showing they have real engagement with the global research community and that they have something to say about problems of some significance. Typical signs of an A journal are lowish acceptance rates and an editorial board which includes a reasonable fraction of well known researchers from top institutions.

        B= Tier B covers journals with a solid, though not outstanding, reputation. Generally, in a Tier B journal, one would expect only a few papers of very high quality. They are often important outlets for the work of PhD students and early career researchers. Typical examples would be regional journals with high acceptance rates, and editorial boards that have few leading researchers from top international institutions.

        C = Tier C includes quality, peer reviewed, journals that do not meet the criteria of the higher tiers."

    c. Attitude of the discipline to journal

In addition to formal ranking systems, people familiar with any given discipline often have their own impressions/valuing of journals. "

2. Relevance of journal?

A second important consideration is the relevance of the journal to the Golden Thread of the paper. Questions to consider here are does the journal publish this type of research (topic, location, quality?). One way of finding out if the topic of your paper is relevant to the journal is to use the program "Publish or Perish" which summarises information in Google Scholar including about particular journals. Often there are several different types of journals you could use relating to the different aspects of the field. For example, if I am publishing on climate change impacts on alpine plants in Australia I could try sending it to a climate change journal, an alpine journal or a botany journal. It's very important in terms of structuring your paper to decide early on one which journal it's going too (see the section on the Golden Thread below).

When you think you have identified a suitable journal, it is very important to look at the journal's "instructions for authors". There will usually be an explicit statement of the aims and scope of the journal. Obviously, you should only submit to a journal if your paper is consistent with the aims and scope. Perhaps a little less obviously, you may want to tailor your paper (particularly the introduction and discussion) to make it explicitly align with the aims and scope of the selected journal.

The instructions for authors will also describe important features about the structure of the papers the journal publishes. There will usually be a statement about the word limit, and often a statement about the number of figures and tables that are able to be included. Instructions will also identify the sorts of papers the journal publishes: for example "notes", "research papers", "perspectives", "reviews". You will need to decide which category your paper fits into and then whether it fits the word limits for a paper of this type.

3. Does it have the right audience?

It's not only important to select a high ranked journal that is relevant to the topic of your research, but you also need to select based on where the 'right' people, find, read and hopefully cite/use your research. Citation of an individual paper can be completely unrelated to the quality of the journal.

Citations of a paper as a measure of its quality

We are moving towards a system where what is important is not the journal but how many people cite your papers. There are some different measures of this including:

Total number of citations. People are now often reporting on how many times their work is cited. You can get this data using 'my citations' in Google Scholar, or in ISI Web of Knowledge.

H –index.

There is increasing use of measures of impact vs number of papers. One of these that is becoming more commonly used since is the H-index. It's a combination of the most cited papers and the number of citations of that paper. Because of variation in citation rates among disciplines it's only relevant within a discipline. Wikipedia has a more detailed explanation of this measure and how it's calculated.

You can use ISI Web of Knowledge to get your citation data but it does not include all types of academic publications.

Alternatively, you can use "my citations" in Google Scholar. A third way is to use the free program "Publish or Perish" mentioned above to get your and others' citation details.

Publish or Perish is a software program that retrieves and analyses academic citations. It uses Google Scholar to obtain the raw citations, then analyses these and presents the following statistics:

- Total number of papers
- Total number of citations
- Average number of citations per paper
- Average number of citations per author
- Average number of papers per author
- Average number of citations per year
- Hirsch's h-index and related parameters
- Egghe's g-index
- The contemporary h-index
- The age-weighted citation rate
- Two variations of individual h-indices
- An analysis of the number of authors per paper.

There is a range of ways to get your research cited. Most obviously do good work and get it published where the right people will see it. Additional ways to help people know about your work are including the pre-publication version of the text and figures of your papers on institution (University) websites so they are available to a wider audience.

You can also send copies of the paper to other academics in the field or at least the title and abstract so they know the work has been published. For this you need to check the journal rules to make sure you are not breaching copyright. The other way of course, is to publish something very controversial.......

So having worked out what criteria you could use to select a journal how do you then finally decided on which one is most relevant? Well you need to work out the Golden Thread of the paper!

The Golden Thread

Although I have described what sort of criteria you can use to select a journal, I actually recommend that before you finally decide on the journal, you need to work out the main thread/plot/point of your paper. An important issue here is that the paper should focus on making a contribution to one particularly theory or question within the discipline. That is, it should have one major story line (the Golden Thread). Sometimes papers suffer from being a dataset in search of a question or hypothesis. These sorts of papers are more difficult to get published than one that has a single focus with a main aim and subsidiary related aims.

Working out the best Golden Thread for you paper should be done after you have designed the experiment, done the research, and analysed the results. I say this because often with research you have one aim in mind when you design and do an experiment, but the results may be surprising. Therefore it's important to update your aims/Golden Thread when you have completed the researcher. Then you need to:

1. Work out what is/are the most important conclusions to your work. What is the most important thing you found?

2. Carefully think about which is the best audience for this work. Where will it have the greatest impact, be read by an audience who really wants to know about this work?

3. Then you can start to structure the argument for your paper. Remember you are writing an argument and it needs to be clear, well structured and lead to the conclusions.

Using a mind mapping process can help. There are a range of programs for this including free software such as XMind. The University also runs courses on using this type of approach. It is particularly valuable to work out:
1. the actual structure of the content of the paper
2. how to structure that content in the best way e.g. which ideas go first
3. how long different sections need to be (sometimes we write too much for some parts of a paper and not enough for others)
4. what you and supervisor/co-author think is the structure of the paper.

A good rule of thumb is that working out what you need to say and then writing it is easier than working it out as you write. Generally it's not a good idea to write the paper in the order its finally appears, but more in the order you do the work. So I recommend the following order for writing....

Table 1. Recommended order for writing sections of an experimental ecology paper.

Sections	Order written
Title	1
Abstract	10
Introduction	7
Aims (last bit of introduction)	3
Methods	2
Results Tables and Figures	4
Results text	5
Discussion	8
Conclusions	6
Acknowledgments	9
References	11

Remember to keep checking the Authors Instructions for the journal. This includes the length of the paper which is often given as the number of words. The length of the paper will affect how much detail you can include. Also print out and keep checking examples of recent papers in that journal that are similar to the topic you will be submitting. This helps to check how other authors structured the different sections of their papers and how much detail they included, and the formatting of tables, text, figures and references in the journal.

But here I will so though the order slightly differently because I want you to use mind mapping to work out the structure of the introduction.

Writing the introduction

Before you start your introduction, make sure you remember what it is for. The fundamental purpose of an introduction is to convince the reader that the question you are addressing is worth answering. If you don't grab the attention of the reader with the first paragraph of introduction, they won't read further. If the reader is an editor, they won't send the paper out for review, if the reader is

a reviewer, then he or she will give a cursory and negative review, and if somehow the paper does get published, if you haven't grabbed the reader's attention your paper won't get read or cited. A good introduction will convince the reader that the work has general and broad relevance. Rather than being about your specific ecological context, you need to demonstrate that your work addresses an important theoretical or practical problem and/or that it is an exemplar that can be applied to a range of other situations in other places.

Remember that your introduction is a carefully stepped out argument from the most general to the most detailed – e.g. your aims, and that the aims need to match what you did and found, not the aims you had in mind when you started the research. The length can vary among papers within a discipline and among disciplines. Social science papers tend to have longer introductions (including sometimes a section headed literature review) than those in ecology. Most ecological research papers I write have introductions that have 3 to 6 paragraphs.

One common problem with writing the introduction is where to start. Most research is conducted in the overlap among several different related areas (Figure 1). But when you write the introduction you have to use a linear format for the introduction. So you have to select which area goes first, second and third till you get to your aims. Generally the one that should go first is the main area of the journal. Mapping out the related areas and the order you are going to present them helps to make sure you do not include too much information in the introduction from too many related areas.
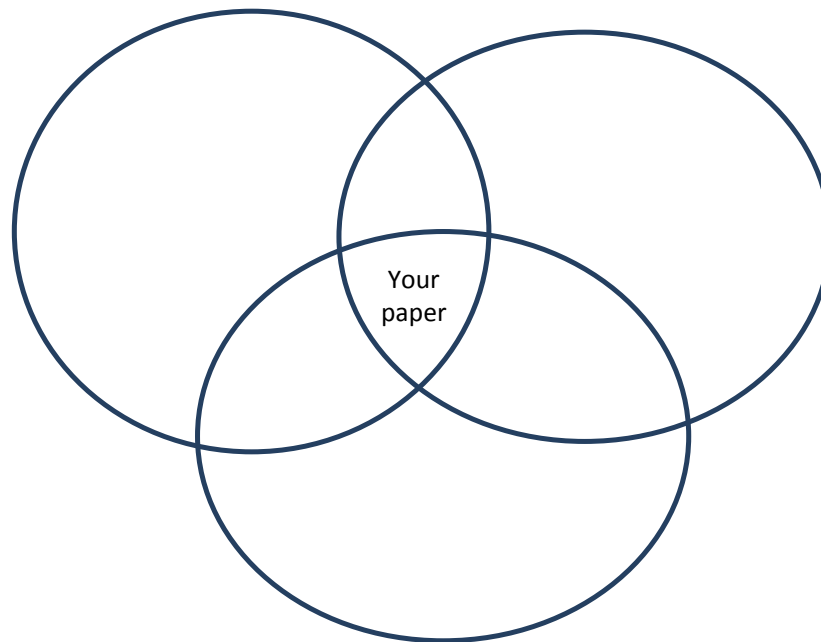

Figure 1. Mapping the related areas that your work contributes to.

Here is an example of the introduction from a paper of mine to show how the argument is stepped out and goes from the most general to the specific aims (Pickering et al. 2011a).

"Introduction
Protected areas are one of the major mechanisms for conservation worldwide (Worboys et al. 2005). Nature-based tourism is not only popular, but it is also one of the few human activities

permitted in many protected areas (Newsome et al. 2000; Worboys et al. 2005). However, a wide range of negative environmental impacts on soils, vegetation, animals and water from tourism activities in protected areas has been documented (Liddle 1997; Pickering and Hill 2007a; Monz et al. 2010). Impacts on plants from common activities such as hiking include the reduced diversity, cover and biomass of sensitive species and, in some cases, an increase in the diversity and cover of more tolerant species including weeds (Liddle 1997; Hill and Pickering 2007a; Hill and Pickering 2009).

Weeds, here referring to undesirable species that are not native to the region, are a major threat to biodiversity, including that in protected areas, as they have many impacts, including altering fire regimes and hydrology, and directly replacing native species (Manchester and Bullock 2000; Williams and West 2000; Weber 2003). Although the association between tourism infrastructure, such as roads and tracks, and the presence of weeds is well documented (Spellerberg 1998; Pickering and Hill 2007b; Pickering et al. 2007) and greater tourism use of a protected area is associated with greater diversity of weeds (Usher, 1988), there is limited research on the contribution of tourists to the dispersal of weed seeds into, and within, protected areas (Pickering and Mount 2010). It is likely that tourists could act as unintentional dispersal agents of weeds. Certainly, human clothing and transport can act as seed dispersal vectors and seeds from over 750 species has been collected from vectors associated with tourist activity: clothing and equipment (228 species), horses (fur 42, dung 216 species) and vehicles (505 species) (Pickering and Mount 2010).

Despite its importance, and the large number of species which can be transported, there are few experimental studies of human-mediated seed dispersal (HMD), by tourists or more generally. There are only three experimental studies of HMD which have examined attachment rates (Fallinski 1972; Mount and Pickering 2009; Wichmann et al. 2009) and three that examined dispersal (Bullock and Primack 1977; Lee and Chown 2009; Wichmann et al. 2009) on clothing. These studies have shown that species differ in their attachment rates, and in plant traits that affect attachment, such as seed/fruit morphology, seed weight, height of infructescences and the number of seeds produced. Attachment rates also vary among items of clothing and with type of material, with some species attaching at higher rates to socks, while others attach at higher rates to trousers (Mount and Pickering 2009). Seeds were less likely to be dispersed by clothing with Velcro, than that without (Lee and Chown 2009). Studies of seed detachment from the clothing of walkers found that seeds can be transported long distances: > 2.4km (Bullock and Primack 1977) and > 5km (Wichmann et al. 2009).

Quantifying dispersal of seeds by any vector requires information on attachment, detachment and the behaviour of the vector (Nathan et al. 2008; Will and Tackenberg 2008). For unintended HMD on clothing, including that by tourists in protected areas, all these factors can be measured and hence spatial dispersal patterns can be calculated. Comparison of dispersal patterns for different plant species on different types of clothing and for different behaviours can indicate the role of HMD in causing long distance dispersal, including that of invasive species. While there are many recent examples of modelling and experimental studies of long distance dispersal by wind (Nathan et al. 2002; Soon and Bullock 2008) and for a limited selection of animal vectors (Mouissie et al. 2005; Manzano and Malo 2006; Pablos and Peco 2007; Will and Tackenberg 2008), studies of HMD on clothing are rare.

We used an experimental approach to examine unintended tourist-mediated long distance seed dispersal on clothing within a protected area in Australia. First we measured detachment rates of seeds from four non-native weed and one native species on two types of clothing (socks and

trousers) at distances up to 5,000 m. Then using values for attachment rates in the field, and data on visitor numbers and behaviour, we calculated potential seed dispersal patterns within a specific landscape, i.e. continental Australia's highest mountain, Mt Kosciuszko."

So the argument in the introduction went
Paragraph 1 = Protected areas – conservation, tourism in protected areas, impacts of tourism in protected areas, examples of impacts including weeds.
Paragraph 2 = Weeds – definition, association with tourism, limited research on dispersal, tourists can disperse weeds.
Paragraph 3 = Few experimental studies on human mediated seed dispersal – discuss examples,
Paragraph 4 = More background on experimental studies of human mediated seed dispersal, but concentrating on those directly relevant to this study
Paragraph 5 = Aims.

   This introduction provided information on impacts of nature based tourism (one circle/area), weeds (second circle/area) and dispersal mechanisms for seed (third circle/area), but for the second and third areas the information was focused on that relating to the aims, not everything on the topic. e.g. the coloured areas of overlap in Figure 2.
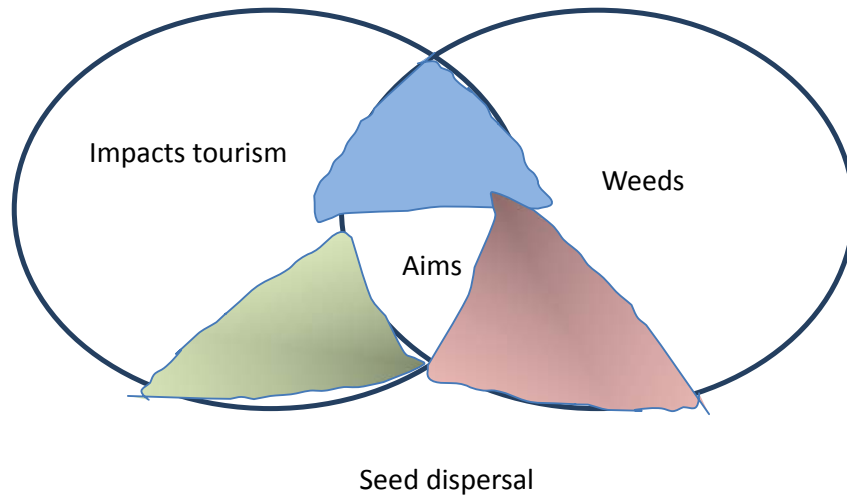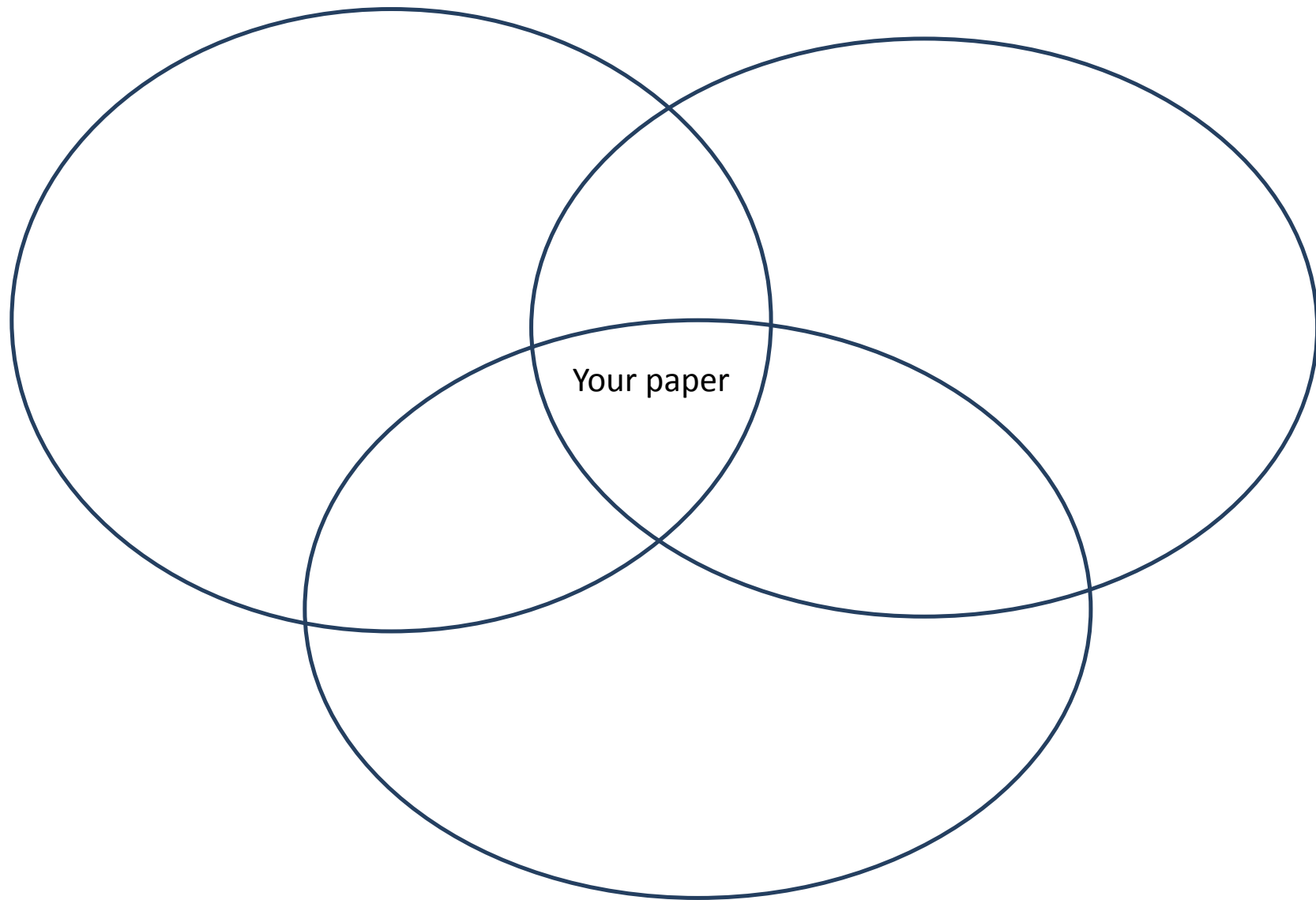

Figure 2. Related areas discussed in the introduction to Pickering et al. (2011a).

Individual work: Now try using the interrelated circles with the paper you have brought along to use as an example.

Your paper

Title/Topic

Paragraph 1

Paragraph 2

Paragraph 3

Paragraph 4

Aims

Writing the methods section

The method is the first section of a paper that people tend to write. It can be the easiest to write in that it has an obvious structure and content. However, it can be challenging to get it right e.g. using as few words as possible to clearly describe what you did. It reflects the classic challenge of writing instructions for doing up shoelaces. Some of reviewer's problems with a paper can arise not because there was a problem with your experiment, but because of how you describe what you did.

The first draft is to put all the information down. Second and subsequent drafts are to work out more and more effective ways to communicate the information. The methods is often around three pages of text in word document but around 1-2 pages in the final version of the paper when formatted for the journal.

Common sections in many Ecological research papers are...

1. Study Site/ Species
2. Sampling Design/Field Work/Laboratory work/survey
3. Data Analysis/Statistical Analysis

The length of each section varies with the amount of detail that needs to be included. Have a look at your example paper. Below I go through examples of the sections common in ecology papers.

Study Site – for field work papers

This section is often 1-3 paragraphs. Here it is best to go from the most general to the most specific. Remember that the audience can be anywhere in the world; in Ghana, Japan or Finland and they have to understand the context of where you did the work. This includes things that may be different about your location (Australia) compared to ones they are familiar with. Often you are likely to include a map of your site showing its overall location (e.g. Australia) and then more detailed information about the actual study site(s) (Figure 3).
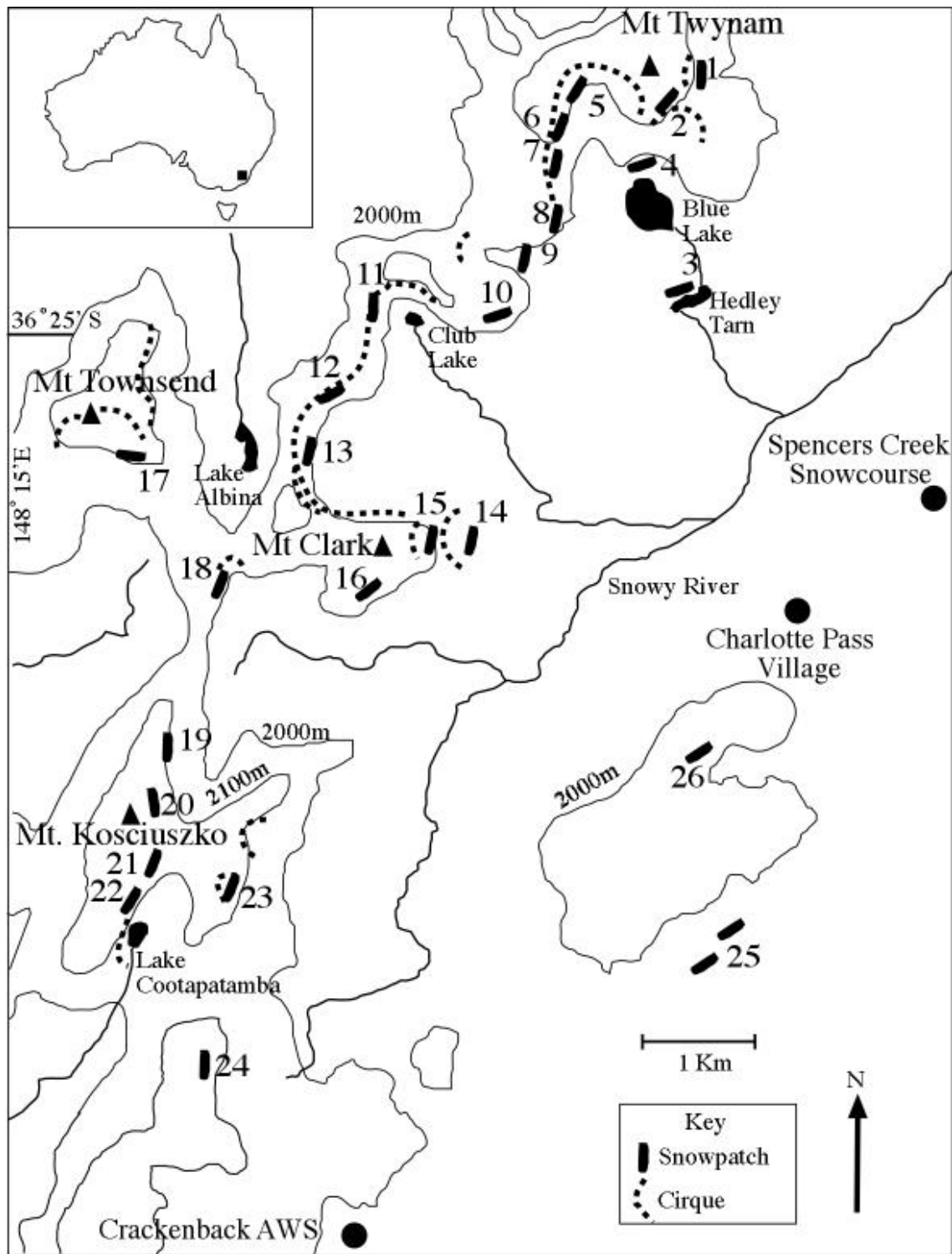
Figure 3. Map of study area showing the sites of all snowpatches in February 2004 and three additional snowpatches occurring in December 2006. Major drainage lines and the 2000 and 2100 m contours are shown. The five water bodies all exist in glacial features. Cirque boundaries are based on Galloway et al. (1998) and Barrows et al. (2001). From Green and Pickering (2009).

Maps of sites should show general location (say country) and then more detailed location. They need a scale and to indicate which direction is north. They need a legend either in the figure or as part of the Title.

Species

This section could be one to two paragraphs. Sometimes instead of, or in addition to the study site you need to include information about the specific species or vegetation types or guild of birds assessed. Again you need to make sure that a reader would understand the context of the research as well as recognise the generality of the results.

Sampling group (social sciences) and method used

If you have used surveys or focus groups or other social science methods, you will need to explain who was sampled, how they were selected and why. You also need to explain the type of method you used (Survey, focus groups, in depth interviews etc) and why. For a survey you need explain the structure of the survey and the aim of the different sections and questions in the survey. Again see examples in the field.

Sampling design/Field work/Laboratory work

This section can be one to five paragraphs depending on the detail required. It should include information on the experimental design, on what was measured, when and how. It's often harder than you think to get the correct information in the right order so it makes sense to someone who only has this section to understand what you did. In some cases you may have several separate experiments so you need to say so up front and then describe each one. Remember this does not have to be in chronological order, but should be in the best logical order for the reader to be able to understand the key results.

e.g. .." *Three experiments examining clothing as a seed vector were conducted in the Park between late January and mid February 2008 when many plant species in the subalpine and alpine zones of the Park are seeding"* From Mount and Pickering (2009).

Note that one sentence can provide several bits of information. This one said how many experiments, where they were done, when and why at that time! Again this is the technique of using multiple drafts to get every word to count!

Data analysis/Statistical analysis

This section should let the reader know about how data were analysed. It's often one to four paragraphs depending on the complexity and range of statistical analyses used. Even if it's just descriptive results, it is good to say so and which ones.

If the data were statistically analysed you need to explain what statistics were performed on which dependent variables testing the effect of which independent variables in which computer packages. You need to state (and do) that you checked the assumptions of the tests, and which/any transformations you had to use. Some transformations are standard e.g. all percentage data should be arsine square root transformed prior to analysis.

It's often good to make clear at the start of a sentence the point of the test e.g.

" To determine whether there were significant differences among summits and among aspects, a Two-way Analysis of Similarity (ANOSIM) was performed for the plant and abiotic dissimilarity matrices." (Pickering and Green 2009).

"To determine if wearing trousers effects seed collection, the number of seeds and species richness were compared using paired t-tests between the covered and uncovered legs." (Mount and Pickering 2009).

Where people may be less familiar with a particularly type of test you may need to provide more detail/justification for why it was used and not another type of test.

Individual work: Go through your example paper and see what sections they have, how they have set out the information and if you can understand what they have done and possibly even why.

Setting out Tables and Figures in the results

Once you have written a first draft of the introduction and methods, the next step is often to produce the display items (tables and figures). It may take a lot of time to get these right, but finding the optimal way to communicate your results visually is always worthwhile. Many papers have two or three paragraphs only of text in the results, with the guts of the results being presented visually, either in figures or in tables.

Before starting to draft tables and figures you should

1. Work out the most efficient layout for your tables and figures. Keep in mind that journals do not like white space. It costs them money to produce the journal and they do not want to waste space on white but rather have content. So keep tables and figures tight and detailed.
2. Check the journal requirements. They often provide specific details in the information for authors section on how the tables and figures should be formatted including the proportions of tables and the size of details in figures. Again using an example of a recent paper from the journal as a model helps.

Tables

Tables are relatively easy to layout. First work out how many tables you will need in the paper and what sort of information needs to go into them. Often you will need tables for the actual values (means and some measure of variance) and the results of statistical tests. For each table you should work out what information needs to be included and hence how many columns and rows are required. It's often a good idea to use the table function in word to set out tables, but not one of their preset formats, as they rarely match the journal requirements. Do not use spaces or tabs to set out tables as different fonts use different amounts of space and it's very hard to fix up tables set out this way.

Table headings should include enough detail so a reader can work out what the table is about and what the values are just from the table legend. Again the most important information should go first in the legends. Table legends go above the table. Remember to make clear what the values are in the table including the units. Are they in cm or m? are they counts or % etc? Either at the end of the legend or at the bottom of your table you need to spell out any abbreviations you use.

Columns: The journal wants as little blank space in the table as possible so reduce the number of columns as much as possible (more important than reducing lines). This particularly applies for headings that cover several rows of data. Put them as a separate row and indent all the rows below that are all aspects of that heading rather than have a separate column (e.g. see example below for Table 2. Species richness per summit and average richness per area). Also only make columns only as wide as the contents require. You can often abbreviate terms in column headings if they take up to much space.

Lines: generally the only lines in the table are above and below the column headings and at the bottom of the table. If using additional lines particularly horizontal ones have a good reason. Again have a look at examples of tables from papers in the journal.

Accuracy: make sure it's relevant to the scale at which you measured things, not just the number of decimal points spat out by computer program for means and standard errors (or other measure of variance). e.g. did you really measure height to the hundredth of a millimetre?

Below is an example of a table of actual values (Table 2). This table includes some site information (e.g. methods) as well as values from each site (e.g. results). Other common results tables give you means ± measures of variance (standard errors or other measures).

Table 2: Location and species richness measures for five GLORIA summits on Mt Clarke, Snowy Mountains, Australia. from Pickering et al. (2008

	CL1	CL2	CL3	CL4	CL5
Altitude (m.a.s.l.)	2114	2079	1992	1948	1729
E	148.2875	148.2911	148.2961	148.3000	148.3078
S	36.4328	36.4328	36.4347	36.4356	36.4356
Species richness per summit	36	39	51	41	53
Total herbs	22	24	12	9	31
Total graminoids	9	8	9	6	9
Total shrubs	5	7	29	25	13
Total fern/fern-like			1	1	
Average richness per area					
10cm^2	2.0	2.8	2.5	2.2	
1m^2	6.2	8.9	9.7	8.6	
4 * 1m^2	9.5	13.25	14.5	13.5	

-5m summit areas	22	22.75	31.5	28.75	31.5
-5 to -10m summit areas	21	25.75	30.5	23.5	28.5
# alpine endemics	6	5	4	3	4
Proportion endemic	17%	13%	8%	7%	7%

Often you will need tables to show the results of statistical tests, particularly if you have many tests. In the heading put in the type of test and the dependent and independent variables (Table 3, from Pickering et al. 2011a). It's good to (well I try to) put in the value for the test as well as the P value. You can also specify the significance level you used. We often put significant P values in bold so they standout in tables. Also I do not use * and ** to indicate which ones are significant, that was something more common when programs did not give you actual P Values. Remember there is no such significance level as P = 0.000. If the test gives you that it's actually <0.001. Remember to give the P values to three decimal points as it can be useful for the reader to know exactly how low is the probability of assuming there is a difference when there is none.

Table 3. Results from One-Way ANOVA's (complete randomized block) comparing transects and treatments (different intensities of bike riding or hiking) for vegetation parameters in subalpine grassland. From Pickering et al. (2011b).

	Treatment		Transect	
	F	P	F	P
Immediately after				
Height	16.718	**<0.001**	0.504	0.771
Compaction	30.450	**<0.001**	1.556	0.198
Two weeks after				
Height	16.487	**<0.001**	1.055	0.402
Compaction	14.881	**<0.001**	2.308	0.065
Absolute cover vegetation	13.459	**<0.001**	3.651	**0.008**
Absolute cover litter	20.392	**<0.001**	3.511	**0.010**
Overlapping cover herbs	11.479	**<0.001**	0.164	0.974
Overlapping cover shrubs	2.945	**0.011**	1.079	0.387
Overlapping cover graminoids	4.284	**0.001**	1.031	**0.413**
Overlapping cover litter	22.018	**<0.001**	0.448	0.812
# species per m^2	4.377	**0.001**	3.445	**0.011**
Poa fawcettiae	2.728	**0.018**	1.215	0.322
Asperula gunnii	6.313	**<0.001**	0.727	0.607
Hovea montana	3.718	**0.003**	0.181	0.968
Oxylobium ellipticum	0.388	0.921	1.550	0.197
Pimelea alpina	1.962	0.078	0.989	0.437

Figures

Figures take a lot of work to get right. They are particularly useful to show trends – e.g. changes in values against attitude or against time or factors like that. It takes a lot of work to get a figure right,

so that it contains enough information without being overly complex. Never the less, they remain one of the most effective ways of conveying information as we are often visual/picture focused. Tables take up less space and are much faster to generate.

 Figure legends go at the bottom of the figure. The journal will often want several figures together, rather than on separate pages so think about this when formatting them. Do not forget to spell out any abbreviations you use. Again its one of the challenges to get them to all fit neatly together. Do not forget to label the axes and make sure the scales are clear and the points can be seen clearly when reproduced. Sometimes the legend can be incorporated into the title, check the journals house style. Also remember again to use all the space in the figure. Journals do not want lots of white, they want content.

The general rule is that figure and text legends should be intelligible without reference to the main text. Conversely, all figures and tables should be referred to in the text, which should explain what it is the reader should take away from the figure and tables.
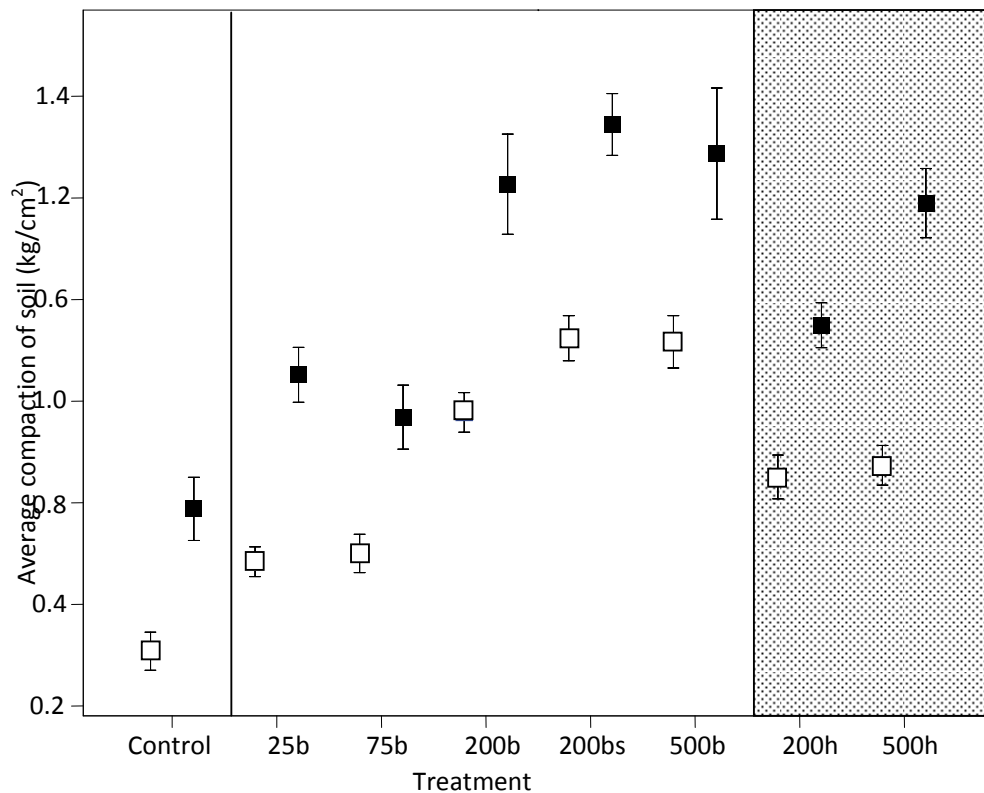

Figure 4. Mean and standard errors of compaction of soil in kg/cm^2 immediately after (clear squares), and two weeks after (solid squares) mountain biking and hiking treatments in subalpine grassland in the Australian Alps. White section = control and biking results, stippled section = hiking results. From Pickering et al. (2011a).

(a)

(b)

(c)

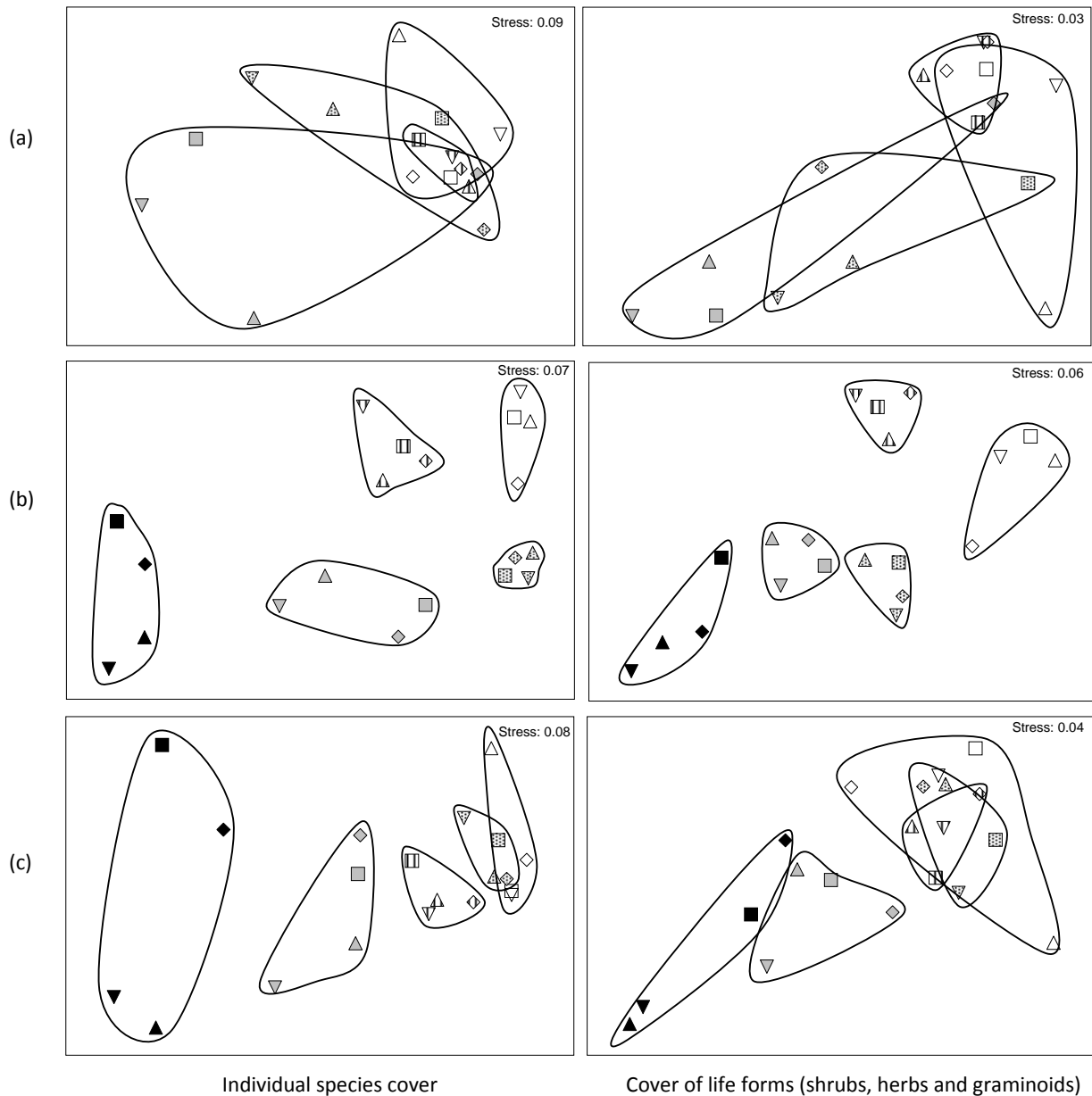Individual species cover   Cover of life forms (shrubs, herbs and graminoids)

Figure 5. Level of separation in plant species composition among the five GLORIA summits on Mt Clarke in the Snowy Mountains, Australia, based on percentage overlapping cover data for all species on each aspect analysed using normalised MDS ordinations of Bray-Curtis dissimilarity measures. Vegetation was sampled at three spatial scales (a) four 1-m^2 quadrats at each aspect for four summits, (b) upper SAS, (c) lower SAS for each aspect. Summits differ in colour/pattern, with CL5 = black, Cl4 = grey, CL3 = stripes, CL2 = dots, and Cl1 = white. Aspect is indicated by shape with east an upright triangle, north an inverted triangle, south a square and west a diamond. The stress value gives an estimate of the closeness of fit of the normalised MDS axes to the dissimilarity matrix with the lower the stress value the better the fit. From Pickering and Green (2009).

Writing the results text

The written section of the results should always highlighting/summarise what is important including in the tables and figures. The text for your results should match the tables and figures. Although this seems obvious, it's amazing how as a paper progresses discrepancies can occur between the table and figures and what's in the text.

The structure of the results including headings can follow the aims – e.g. the reader should have some idea of the order in which the results will be presented by now.

e.g. for a paper the aims were

.... *"Specific objectives of the research were to assesses: (1) the impact of mountain bike riding, (2) the effect of different levels of use, (3) the impacts of riding a bike up and down a slope compared to across a slope, and (4) directly comparing the effects of mountain bike riding and hiking for moderate (200 passes) and high usage (500 passes)."* From Pickering et al. (2011b).

Headings in the results were

3.1 The effect of mountain bike riding on subalpine grassland

3.2 The effect of riding on a slope compared to level subalpine grasslands

3.4 The effect of hiking on subalpine grassland

3.5 Comparing the effect of mountain bike riding and hiking on subalpine grassland

Again this highlights how you have to match your aims with your main results – this is why working out the Golden Thread early is a good idea.

Often the results might start with a summary of the scale/detail of the data before going on to the results of any tests....e.g.

If plant/vegetation type data: it could indicate what the vegetation was like – e.g. cover, number species, dominant species- again this gives background to then interpret the effect of what you are testing e.g.

 "The undisturbed subalpine grassland at the site had nearly complete cover of vegetation (98% absolute cover), dominated by the tussock Smooth-blue Snow Grass (Poa fawcettiae, 95% overlapping cover), low growing herb Asperula gunii (33%) and the shrub Hovea montana (18%). A total of 23 taxa were recorded over the 48 m^2 assessed (e.g. 48 lanes), 18 of which were herbs, eight graminoids (grasses and allies) and seven shrub species (Supplementary material 1). The only non-native species recorded was the herb Acetosella vulgaris." From Pickering et al. (2011b).

Then just after this, or if a general initial section not needed for your study, start with your overall result! Remember always put the most important point in the first part of a section, in the first sentence in a paragraph, and in the first words in a sentence.

e.g.

"Both hiking and mountain bike riding damaged the subalpine grassland. The only parameters that were not affected by these activities were the overlapping cover of the two shrubs: Oxylobium ellipticum and Pimelea alpina (One-Way ANOVA or One-Way ANOSIM, Table 1)." From Pickering et al. (2011b).

 "Dispersal of seeds

All five species have seeds that could be dispersed unintentionally by humans over long distances. Although between 20% and 70% of seeds were dispersed from clothing in the first five metres, some seeds from all species were still attached to socks at 5000 m (Fig. 2)." From Pickering et al. (2011a).

Look to ways to make the sentence structure flow e.g. not to clunky with too many values imbedded in the text, and put the most important information first.

e.g. not..."In paired t tests a significant differences (t= 16.2 I, P = 0.0389) was found between X and Y (Table 2). When the values are compared, X was 72.6 ± 0.6 cm compared to 32.5 ± 1.6 cm for Y (Table 3)."

This could be shortened too ..." X was more than twice as tall as Y (Tables 2 and 3)."

If you use figures rather than tables for means and standard errors, you might want to quote some values in the text of the results so they can see how they differ ..." With a mean height of 73 cm, X was more twice as tall as Y (Table 2, Figure 3)."

Remember you cannot start sentences with abbreviations. e.g." 7 species were found...." instead it should be "Seven species were found".

Individual work: Go through the results section of your example paper and see what information they have included. Look at the tables and figures, - how many, what information was included, and how were they set out? Also look at the written results section – how was it structured and what results did they highlight?

Writing the discussion

Along with the introduction, this is the critical place in which you can emphasise the importance and novelty of your work (and remember that it is importance and novelty that make the difference between publishing in a top ranking and middle ranking Journal). To put this cynically, this is where the "spin" comes in. The introduction is about why your question was worth answering. The discussion explains what your results mean and why they are of relevance to other people. It's most important that the discussion should commence on a positive tone. Many people fill the discussion with caveats and problems with the particular study. These need to be there, but don't lead the discussion off with them. A good discussion will commence by reiterating what the key findings were and then lead on to their broader implications. Refer back to the introduction here, explaining why your results advance general theory, why are they are valuable, and why your study is an exemplar that could be applied in other situations. Having covered all this positive stuff, you can

then talk about the caveats, restrictions, technical problems (how the flood ate my replicates) and how you would do it better next time around.

Remember the discussion should discuss you results in relation to the literature, why they are important, and their limits. Although this seems self evident, it's amazing how easy it is to forget this! You should set your work in the context of other published studies (try to be positive here: if you bag previous studies, be aware that journal editors will usually send papers for review to people who have done similar work. "this project extends the pioneering work of Bloggs (1999)..." is a nice way to put it. "This project does not take the simplistic approach of Bloggs(1999)..." is a rather riskier way of putting it).

Discussions are often longer than introductions. For example there are more paragraphs in the dissuasion than the introduction (introduction vs discussions 9 vs 13, 6 vs 8, 5 vs 11). There seems to be no standard structure for discussion, compared to the relatively straightforward structure of the introduction. This makes it even more important to work out what you want to say (mind map) before starting to writing. Also, as exhaustion with writing is starting to set in by the discussion, it can be easier to under write your discussion.

Some common sections/topics for the discussion are...

Restating your aims as outcomes (and make sure they are the most important point of the research!). This is a good way to start the discussion. e.g.

This study shows that xxxxx. It also shows that xxxxx. The combination of xxx with data on xxxx allowed estimates of the amount xxxx. In doing so, the study has demonstrated xxxx

Then you can discuss your results in relation to the literature....

The results of this and other studies (xxxxx) demonstrate that.....

In this and several other studies there was......

Results from this and other studies all found that....

This study doubles xxx the number of xxx with quantified values of xxxx, and, to our knowledge, it is one of only xxx experimental studies examining xxxxx.

You should talk about other studies that have found different results to your own and why....

You will need to highlight the implications of your research....

The methods used in this paper provided useful information on xxxx

If it's a management journal, then discuss management implications, if conservation journal discuss conservation implications... etc.

There are several options open to land managers in dealing with xxxx. Management could take a direct approach xxxx This is likely to address safety and liability risks associated with the presences of xxxxx This approach also does not address the xxxxx

The presence of large numbers of xxxxx clearly demonstrates that the conservation value of xxxx may be reduced by yyyy

A better understanding of xxxxx will also assist xxxxxx

Discuss the limits of the research (but with a positive spin) and where to next (future research)...

This study considers xx but not the following processes.
This study only looked at xxxx and not at xxx and hence was not able to assess xxxx

Estimation of xxxx was based on a number of assumptions. It was assumed that xxxxx. A second assumption was that xxxx. Third, we assumed that xxx. Fourth, our calculations apply to the xxxx situation. What is clear is that xxxx

The methods used here were limited to data that could be collected directly from xxxx. It therefore did not address many important xxx issues

Although more information regarding the relative impacts of xxx and other xxx such as xxx is important, it is unlikely to resolve all of the tension and debate about the appropriateness of each of these activities xxxx

Further research in Australia and xxxx will improve our understanding of... This should include studies examining...... Also, there is a need for more detailed modelling of...... as has recently been conducted in .....

Individual work: Go through the discussion section of your example paper. How was it structured, how did they discuss their results in relation to the literature. Did they highlight the limitations and implications of their work?

Writing the conclusions

The conclusions are a short summary of what you found and its implications, and hence usually consist of the main results and their importance/implications. Usually it's only one to two paragraphs maximum.

Examples:

The construction and use of unauthorised trail technical features by mountain bikers has clear environmental, safety and management issues, while operating within an as yet unquantified social setting. In recent years there has been an expansion of sporting activities, such as mountain biking, taking place in natural areas and especially those in the peri-urban setting. Such users have specific requirements and it would appear that they do not always have a responsible attitude towards environmental integrity. The solution of what to do, however, is not always obvious and will vary with the environment, location of a site, who is responsible for managing it, the riding community and the broader community. What is apparent is that turning a blind eye to the presence

of such features in natural area in and around cities is unlikely to be the optimum solution, for land managers, users of the reserve and conservation. From Pickering et al. (2011b).

Writing the acknowledgments

The acknowledgment section should acknowledge and thank all those who helped with the research including the field work, laboratory work and statistics, those who funded the research, and those who provided comments on the manuscript. Remember to keep them short, focused and unemotional e.g. no mention of family or pets unless they did lots of field or laboratory work!

Examples:

Writing the abstract

Abstracts are very short summary of the whole paper, often only 150-300 words depending on the journal. Again it's really important to make sure you know how long it must be before starting to write as it's easier to work out how much detail to include when you know the word limit. Remember every word in the abstract must count so really keep it focused. I rewrite the abstract more than any other part of the paper. A rough rule of thumb for the abstract is one sentence for the introduction, one for the aims, one for the methods, one or two for results, one for discussion and one for conclusions.

The introduction sentence (s) can often be a statement. The aims sentence can be combined with some of the methods with a follow on link from the introduction. e.g. *Therefore xxxx was assessed in xxx using xxx.* The results should be clear and contain the major points e.g. highlight the relationship between data – which was larger, smaller, greater etc.. The trick is to get in as much detail in as possible including some actual values. The discussion/conclusion sentences should reinforce the importance of what was found.

Examples:

*Mountain biking is a popular activity in urban areas, including in forest remnants in Australia cities. To increase the technical challenge for riders, trail technical features such as jumps, bridges, mounds and ditches, along with informal trails are often constructed without authorisation. **We assessed the** social, environmental and management challenges associated with the presence of such features, developed a method for assessing them, **and then used this method to examine them***

in an endangered forest within the Gold Coast in Australia. In a 29 ha remnant of Blackbutt (Eucalyptus pilularis) forest there were 116 unauthorised features, mostly jumps, ditches and mounds, which collectively resulted in an area of 1601m2 of bare soil and 4010m2 of undergrowth cleared. Features differed in their size, construction materials used, and their impacts on the environment. Although nearly two thirds had low to moderate safety, most were in moderate to good condition, had fall zones and optional routes for riders. Management options for land managers, in this case a publicly funded University, include (1) feature removal and site rehabilitation, (2) conversion to official features, (3) removal and provision of an alternative location for official features, or (4) maintain the status quo. There are social, financial and environmental benefits and limitations to each of these options highlighting that unauthorised trail technical features are a challenge for planners and managers that often have no easy solution. A 229 word abstract from Pickering et al. (2010).

Dispersal is critical step in plant invasions but there is limited information about human-mediated long distance seed dispersal, including in protected areas. Seed dispersal by hikers was quantified for five invasive species (the native Acaena novae-zelandiae, and the non-native weeds Rumex acetosella Anthoxanthum odoratum, Dactylis glomerata and Festuca rubra) in part of Australia's Kosciuszko National Park. The proportion of seeds remaining attached to trousers and socks was quantified for replicated short (150 m) and long (5,000 m) distance walks. Functions were fitted for each dataset, and parameters compared among species and between trousers and socks. Dispersal data were combined with attachment rates and the number of people undertaking walks to estimate the total number of weed seeds that might be dispersed. The power exponential function gave the best fit for the majority of datasets, indicating that detachment probability decreased with distance. Seeds of all five species were more tightly attached to socks than trousers, with some seeds still present on socks at 5,000 m. Anthoxanthum and Acaena seeds were more tightly attached to clothing than the other species. Theoretically 1.9 million seeds could be dispersed on socks or 2.4 million seeds on trousers through a season but the actual numbers are likely to be much lower because of limited weed seed at the start of the walks. Because of differences in attachment and detachment rates, seeds from Acaena were more likely to be dispersed longer distances. Long distance human mediated seed dispersal is potentially a major cause of spread of invasive weeds into protected areas that favours some invasive species over others. A 262 word abstract from Pickering et al. (2011a).

Mountain biking is an increasingly popular, but sometimes controversial, activity in protected areas. Limited research on its impacts, including studies comparing biking with hiking, contributes to the challenges for mangers in assessing its appropriateness. The impacts of mountain bike riding off trail were compared to those of hiking on subalpine grassland in Australia using a modification of a common trampling experimental methodology. Vegetation and soil parameters were measured immediately and two weeks after different intensities of mountain biking (none, 25, 75, 200 and 500 passes across slope, 200 pass up and down slope) and hiking (200 and 500 passes across slope). There were reductions in vegetation height, cover and species richness, as well as changes in species composition and increases in litter and soil compaction with riding. Riding up and down a moderate slope had a greater impact than riding across the slope. Hiking also affected vegetation height, cover and composition. Mountain biking caused more damage than hiking but only at high use (500 passes). Further research including other ecosystems, topography, styles of riding, and weather conditions are required, but under the conditions tested here, hiking and mountain biking appear to be similar in their environmental impacts. A 197 word abstract from Pickering et al. (2011b).

Why lots of drafts?

It's amazing how many drafts it takes to write a paper. Even when I am writing it myself and with a fair bit of experience, I tend to use several (four or more drafts) before I am happy with a paper. When starting out writing papers it can take even more drafts as you are learning both what goes in (and out) of each section, and also working on the detail of the particularly paper. Few people, even those very good at writing, can write the perfect paper 'first go'. Different drafts have different functions. The first draft of a paper (or sections of a paper) is about getting the idea/information down in words. The second (or later) drafts are about working out a better way to convey the information including the structure, flow and wording of the text. Later drafts are about checking it's all there and there and there are no errors etc.

When co-authoring papers, including with your supervisor, the different drafts again have different functions. The first/second draft you show them is where you want feedback on the overall structure etc of the paper e.g. does what you have written make sense, is it complete (or too much), is it logical and well argued, have you pitched it right? The next draft is different. Here you want feedback such as is this better and am I getting there?

I recommend having someone who is not an author read the paper. It can be a good complete draft where you want them to check if it make sense to someone not familiar with what you have done e.g. are the methods clear and include enough detail (but not too much), can they work out what they research is important, what you found, and why it's important. Is it logical and well argued and is it appropriate for the journal?

I also recommend getting the final draft proof read before submission. As you will see below, reviewers get frustrated if they have to act as a proof editor for a paper. The final proof read should check for things such as is the formatting correct, references are complete, and no typos.

Formatting the references

References should be straight forward but seem to always be a challenge. First just accept the fact that journals have their own foibles with references and that referencing styles differ among journals. Here I have included examples of the stated type of information required for the most common types of material you will reference. Exactly what is in italics, bold, comers, full stops, brackets etc will vary among journals. Just make sure your Endnote or other reference database contains all the correct information for each type of reference when you first include a reference. When you actually include the citations in text and in the reference list you will need to carefully check the journal instructions to authors and a recent copy of a paper from that journal to make sure that you get all the fine detail right.

For **journals** the basic information is:
Authors (including initials), Year, Article title (and not with all words starting in a capital which is what will happen if you cut and paste from the actual title in the journal itself!), Volume Number, Issue (rarely used but sometimes required), Page numbers.

Example:
Pickering, C.M. and Buckley, R. (2010) Climate response by ski resorts: the shortcomings of snowmaking. *Ambio*.39, 430-438.

For a **book** the basic information is:

Authors (including initials), Year, Title (This time more common to capitalize each word, but occasionally journals do not want this), Publisher's name and... City the publisher has an office in (this is the hardest information to get – but it needs to be a city, not a suburb, or a state), you might also include Country and Number of pages in the book.

Example:
Green, K. and Osborne, W.S. (1994) *Wildlife of the Australian Snow-Country*. Sydney, Australia: Reed.

For a **book chapters** (which is the longest type of reference usually) the basic information is:
Author(s) (including initials), Year, Chapter title (again and not with all words starting in a capital) then Editors of the book (including initials), Title of the Book, Publishers name and... City the publisher has an office (this is the hardest information to get – but it needs to be a city, not a suburb, or a state), Page numbers for the chapter.

Example:
Pickering, C.M. and Hill. W. (2003) Ecological change as a result of winter tourism: snow manipulation in the Australian Alps. In R. Buckley, C.M. Pickering and D. Weaver, (eds.) *Nature-based Tourism, Environment and Land Management*. (pp. 137-149) New York: CAB International Publishing.

For a **government or similar report** the basic information is\:
Authors (including initials), Year, Title (This time more common to capitalize each word, but occasionally journals do not want this), Government Agency name and... City where the agencies is based (this is the hardest information to get – but it needs to be a city, not a suburb, or a state), you might also include Country and Number of pages in the report.

Example:
Pickering, C.M., Good, R. and Green, K. (2004). *The Ecological Impacts of Global Warming: Potential Effects of Global Warming on the Biota of the Australian Alps*. Australian Greenhouse Office, Canberra. 48 pp.

For **conference proceedings** the basic information is:
Author(s) (including initials), Year, Title of presentation/abstract (again and not with all words starting in a capital) then Editors of the conference proceedings (including initials), Title of the Conference, Date of conference, City of Conference. Page number for the abstract.

Example:
Pickering, C., and Scherrer, P. (2008). Managing tourists on the top of Australia: past, present and future challenges. pp. 319-325. In: R. Dowling & D. Newsome (Eds.). Proceedings of the Inaugural Global Geotourism Conference, 17-20 August 2008, Perth, Australia.

Sometimes conference proceedings are published by an academic publisher, particularly where they are fully referred conference proceedings in which case the format is just as if it was a book chapter.

For a **website** the basic information is:

... well it depends – if you used the website to get a report, but the report is published, then reference the published version of the report as just a report... but if its data from a website and

that's they only place its available then.. its: Year, Title (or information), Date accessed and Website details.

Example:
Bureau of Meteorology (2008) Falls Creek, Mt Hotham and Mt Buller Automatic Weather Station. Accessed 2 July 2008 from http://www.bom.gov.au.

If it's a **PhD thesis** then the basic information is:
Authors (including initials), Year, Title (This time more common to capitalize each word, but occasionally journals do not want this), Type of thesis, Institution, City where institution based (this is the hardest information to get – but it needs to be a city, not a suburb, or a state), you might also include Country and Number of pages in the thesis. If it's available online put in the link.

Example:
Growcock, A.J. (2005) *Impacts of Camping and Trampling on Australian Alpine and Subalpine Vegetation and Soils.* PhD Thesis, Griffith University, Gold Coast. Available at: http://www4.gu.edu.au:8080/adt-root/public/adt-QGU20060818.164033/index.html.

Submission process

So you have finished writing, editing and formatting the whole paper and are ready to submit it. Well set aside some time, because it always seems to take longer than I expect.

Just before submitting the paper I recommend:
1. Rereading carefully the author guidelines to make sure you have formatted the manuscript, tables and figures correctly including the references and tables, that it's not too long, and that the figures are in the right format for the journal (sometimes they want them as separate documents and saved in particular formats).
2. Double check all the references in text are in the reference list and the reverse.
3. Having the final version proof read professionally or by someone you know is good at doing this. It's amazing how many extra typos etc they can pick up.

Now let's go through the requirements from one journal, Oikos, to see what they say and want you to do.....

You should already have had a look at the aims and scope which state...:

"Oikos publishes original and innovative research on all aspects of ecology, defined as organism-environment interactions. Emphasis is on theoretical and empirical work aimed at generalization and synthesis across taxa, systems and ecological disciplines. Papers can contribute to new developments in ecology by reporting novel theory or critical empirical results, and "synthesis" can include developing new theory, tests of general hypotheses, or bringing together established or emerging areas of ecology. Confirming or extending the established literature, by for example showing results that are novel for a new taxon, is given low priority. We publish standard papers and short papers in the Forum section that aim to stimulate discussion by promoting ideas and synthesis of high novelty. Forum papers should strive for novelty, conceptual unification and serve as a point of departure for future work rather than retrospective summaries of established fields or topics"

The key words here are "generalisation and synthesis". So, to get your paper into Oikos, you need to demonstrate that your research is of general importance and ideally can lead to new synthesis. This needs to come out very explicitly in the covering letter and also in the introduction and discussion.

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Manuscripts are edited to improve communication between author and reader.

Authors will receive electronic proofs via e-mail, together with the Exclusive License Form (ELF)). Correct **only** *printer's mistakes. You will be charged for excessive corrections beyond such mistakes.*

Exclusive Licence Form. *Authors will be required to sign the* Exclusive Licence Form *(ELF) for all papers accepted for publication. Signature of the ELF is a condition of publication and papers will not be passed to the publisher for production unless a signed form has been received. Please note that signature of the Exclusive Licence Form does not affect ownership of copyright in the material. (Government employees need to complete the Author Warranty sections, although copyright in such cases does not need to be assigned). After publication authors will retain the right to publish their paper in various media/circumstances (please see the form for further details). To assist authors an ELF can be supplied by the Editorial Office. Alternatively, authors may like to download a copy of the form.*

No offprints will be supplied. Instead corresponding authors will receive a locked PDF file to the use at their discretion.

There are no page charges. We do, however, charge for colour printing.

Authorship. *Statement on authorship. Papers should conform to recommendations for authorship provided by the International Committee of Medical Journal Editors (the Vancouver Group; see* http://www.icmje.org*). That is, authorship of a paper carries with it responsibility as well as credit. All those whose names appear as authors should have played a significant role in designing or carrying out the research, writing the manuscript, or providing extensive guidance to the execution of the project. They should be able to present and defend the work in a public forum. Honorary authorship is to be avoided. All authors must be in agreement on both the submission and full content of any article carrying their name. Any violation of these conditions represents academic misconduct and will be dealt with accordingly.*

Manuscripts
Manuscripts should be submitted as one single pdf-file with tables and figures included. Upon acceptance the manuscript should be provided in Microsoft Word, Rich Text Format or Post Script format with high resolution figures included. Oikos does not yet accept manuscripts in Microsoft Word 2007 format.

Language. Manuscripts should be in English. Linguistic usage should be correct. Avoid the use of the passive voice. Avoid extensive reviews in the Introduction and Discussion. Cite only essential sources of a theory or opinion.

Title. The title should be brief and contain words useful for indexing and information retrieval.

Text. The first page should contain only the title and the author's name, address, fax and email-address. Page two contains the abstract, in which the main results of the work should be summarized. The abstract should not contain more than 300 words. Begin the introduction on page three. Avoid right margin justification and hyphenation. Double-check the contents of your manuscript before submitting. Only printer' mistakes in proofs will be changed free of charge. Oikos do not print symbols or formulas in italics.

Illustrations. Tables and legends of illustrations should be written double-spaced on separate sheets. Do not incorporate the legend in the figure itself. Tables and illustrations should be comprehensible without reference to the text. Do not use italic lettering.

Figures should be planned to appear with a maximum final width of 8 cm (single-column), 12.5 cm (1.5 column) or 16.6 cm (double-column). The font used in figures should be either Helvetica or Arial. Letters, numbers and symbols must appear clearly but not oversized. A suitable final size for lettering is 1-2 mm at reproduction size. One uniform size throughout is generally recommended. Avoid complicated symbols or patterns. Use open and closed circles, squares and triangles; open, striped and closed bars in histograms. Each figure should be boxed in and scale marks (turning inwards) provided. Lines should be clear, but not thick and heavy. Plan your illustrations for the smallest size possible (one column). Be sure that the lettering is clear and readable, even if the figure is de-sized.

Colour plates may be included at the author's expense, €300 per paper.

Units. Use SI units as far as possible.

Nomenclature. Binomial Latin names should be used in accordance with International Rules of Nomenclature.

References. In the list of references (double-spaced), the following usage should be conformed to:

Journal
Haila, Y. and Järvinen, O. 1983. Land bird communities on a Finnish island: species impoverishment and abundance patterns. - Oikos 41: 255-273.

If more than two authors: Lindsay, A. et al. 2000. Are plant populations seed-limited? A review of seed sowing experiments. - Oikos 88: 225-238.

Book
Mayr, E. 1963. Animal species and evolution. - Harvard Univ. Press.

Chapter
Goodall, D. W. 1972. Building and testing ecosystem models. - In: Jeffers, J. N. R. (ed.),
Mathematical models in ecology. Blackwell, pp. 173-194.
In the text references are given: Mayr (1963) or, at the end of a sentence, (Mayr 1963).
Titles of journals should be abbreviated following Biological Abstracts. If in doubt, give the title in
full. Do not refer to unpublished material.
The list of references should be arranged alphabetically on authors' names and chronologically per
author. If the author's name is is also mentioned with co-authors the following order should be
used: publications of the single author, arranged chronologically - publications of the same author
with one co-author, arranged chronologically - publications of the author with more than one co-
author, arranged chronologically. Publications by the same author(s) in the same year should be
listed as 2004a, 2004b, etc. Reference lists not conforming to this format will be returned for
revision.

Excessive use of references causes unnecessary long articles. To avoid excessive use of references,
use only the most relevant. As a rule, avoid using more than 50 references in a regular research
paper.

Acknowledgements. Keep them short.

Appendices: Supplementary material may be posted as electronic appendices on the journal's
appendix site.

Read important instructions on how we handle supplementary material here.

***Authors are recommended to follow the guidelines set out in**: O'Connor, M. 1991. Writing*
*successfully in science. - Harper Collins Academic, London, **and to examine the latest issues of***
***Oikos**. Manuscripts not conforming to the requirements will be returned for revision.*

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It is also critically important to make sure that the covering letter you write to go with your
submission very explicitly identifies why your paper fits within the aims and scope of the journal.
Particularly with high impact journals, your first hurdle is to get the paper past the editor so that it
goes out for review. Many high impact journals will reject most papers without review because the
editor thinks that they are insufficiently important, novel or significant. To jump this hurdle, the

covering letter is extremely important. Don't leave it until you are actually on the on line submission webpage and don't make it simply "I submit this paper for consideration for publication in your journal..." A good covering letter will identify what is original and significant about your paper, why it is of general interest and why this particular journal should publish it. As you can see it's very detailed including information about the length and style of the document, the way tables, figures and reference are formatted but also statements about originality etc, and about copyright. It also talks about the online submission process.

Online submission

Nearly all journals now use online submission process. First you will need to log in and register with the website/journal if you have not submitted to that journal before. They will ask you a for range of information including contact details, affiliations and areas of expertise (because they often use their author list for selecting reviewers!). They will send you an e-mail with your password and name.

Then you will need to log into the website to actually submit the paper. Before doing so, you need to have all the files in the correct format etc ready for uploading. In the online system they will collect a lot of information using drop down boxes etc. This includes information about each author so make sure you have it ready including each authors e-mail address, affiliations, phone numbers etc!. You will often have to copy and paste the title and the abstract onto their system as well as have them in the document. Nearly always, the copy of the paper you actually upload will have all personal information removed (e.g. authors and their affiliations and acknowledgments).

Sometimes you get partway though uploading and there is something extra you have to do. This can include providing...

- A covering letter that includes agreement to the conditions of the journal (e.g. all authors agree to submission of this version of the document, that the paper is not being simultaneously reviewed by any other journal, that it has not previously been published) and that it is relevant to the journal (and why). As stated above, the covering letter is very important. Don't draft it on the fly when you are in the middle of submitting and do take the time to have someone else critically review it. A covering letter should be only two or three paragraphs, but these are probably the most important paragraphs you will write.
- Suggested referees. Some journals get you to provide details of potential referees. Think about this before hand as it's not good doing this in a rush. You will need to find and include their contact details! Many journals require that you suggest three or four referees. Even if they don't actually ask you for reviewers, it never hurts to suggest two or three referees in your covering letter. It is increasingly hard for journals to find reviewers and they will almost always use at least one and probably two of the referees suggested by authors. Make sure that your suggested referees are at least sympathetic to your conceptual approach, but avoid suggesting reviewers with obvious conflicts of interest (e.g. people in your own school, or people with whom you regularly publish). You can also recommend that the paper should not be sent to certain people. You may need to provide a reason (try not to be personally abusive!). It is rare for a Journal editor to deliberately send a paper for review to someone whom an author has suggested not be used.

Remember it takes a while to upload the paper so set aside two hours or more for this when you won't be interrupted! It may take less time than that, but often it takes longer because of something unexpected!

Once you have uploaded everything, the program will generate a PDF of your documents which is what will be sent to the reviewer. You will then have to check the PDF and agree it's ok before they will accept it as the final submission. Do check it as often you might find you have uploaded the wrong version, e.g. not the final one, not the one without having removed identifying material etc.

The paper will then go to the editor (or subeditors). In some cases they will cross check it for length etc and bounce it straight back if it's not formatted correctly. Some journals will assess the paper as suitable before sending it to review. If they do not feel it is relevant to the journal, good enough or formatted correctly, they might reject it then and there! Otherwise it's off to reviewers... and you will wait 3 months or more to hear back! Higher ranked journals make greater use of the subeditors to decide if the paper is worth sending out for review, so sometimes the initial rejection will be fast (hours or days).

The process of refereeing a paper

Reviewing is voluntary and can take quite a lot of time so be nice to the reviewer by making sure they are not copy editing your paper!

Reviewers generally are asked to make one of the following recommendations
1. Accept with minor changes. This tends to be dealing with typos, missing details in the references and stuff like that.
2. Accept with major changes. This includes clarifying material, adding sections and rewriting parts of the document. It may require some changes to the analysis, and even in a few cases a recommendation for some more field work. A critical issue here is whether the paper will be sent back to the reviewer or not and how big are the changes required.
3. Reject. In some cases this can be because it's not the right journal. This goes back to the issue at the start of selecting the right journal. Also if you sent it to a high impact journal then the rate of rejection will be quite high (and often fast!) so it may not be that the work is not good, but just not good enough for that journal. Remember not every experiment is worth publishing in Nature!

Reviewers are asked to consider a range of issues. Here are the types of questions reviewers are often asked to consider (it the information sent out to reviewers from a particularly journal)...

1. Is the material appropriate for the journal, is it likely to be of interest and importance to the journals readership and is it original and scientifically sound?

2. Is the manuscript written clearly and concisely?

3. Does the introduction state and justify an aim for the study or a specific question to be examined (one of the most common problems)?

4. Are the conclusions justified by the information presented?

5. Were appropriate methods used?

6. Are they sufficiently well described for this study to be repeated by someone else?

7. Any obvious flaws in the experimental or survey design?

8. Is the statistical analysis appropriate and validly applied?

9. Are the tables and/or figures adequate and necessary?

10. Could information in tables be more effectively presented in another format (e.g. graphs or histograms) ?

11. Could some figures or tables be combined?

12. Do the legends of the figures and tables permit comprehension without reference to the text?

13. Are all (and only) the pertinent reference cited?

14. Have important part of the published literature in the field been omitted?

15. Are the reference complete and in the appropriate format for the journal?

16. Are all the references in the bibliography refereed to in the text, and visa versa ?

17. Is the title appropriate for the subject matter?

18. Does the abstract adequately summarise the aim or question asked, the main results and the conclusion(s)?

Dealing with referees comments

Getting back referees comments can be stressful. I suggest that it can feel like a grieving process when there are negative comments (e.g. denial, anger, bargaining, depression and finally acceptance). Anxiety about being judged and found wanting can be a major disincentive to submitting papers particularly for new researchers. One of the secrets is that nearly everyone has had negative reviewer's comments some time. So watch the third reviewer on YouTube (http://www.youtube.com/watch?v=-VRBWLpYCPY) and have a laugh and remember reviewers comments are about making your paper better, even if it's rejected by the current journal.

Individual reviewer's comments tend to fall into four categories.
1. Minor editorial changes. Start with these as they are easy to do and remind you of the content and detail of the paper. They are about typos etc through to recommendations for rewording sentences etc.

2. Slightly more complex recommendations, often involving adding or clarifying information in the methods and results. Again, often just do them if you agree with them.

3. Recommendations for structural changes to the paper, or reanalysis of the data or similar issues etc. Look at these carefully and see if you agree with them. Sometimes the problem arises from a lack of clarity in the methods e.g. what you did was correct, but you did not make it clear. In this case you can make an argument for not doing them, but also apologise for not having been clearer in the methods and fix them! Sometimes you realise you could do a better job with the paper based on the reviewers suggestions. If you agree with what they suggest and it's not too much work (e.g. re start field work) then do the changes. It may take a week or more but it's usually worth it.

4. Major changes you do not agree with and do not want to do. Here the critical issue is does it go back to the reviewer or the editor. If it's going to the reviewer, you are going to have to convince them that what they recommend is not appropriate. This is much harder than convincing the editor, who may not fully agree with the reviewers comments themselves. In some cases you will have to say – ok, it's not going to get published here and send it somewhere else. In others you can make a clear argument why the changes are not required.

Here are some examples of the different of types of comments I have made as a reviewer...

Recommendation - minor changes
This is an important contribution to xxx, as it documents a habitat/activity xxxx that has received less attention than other activities such as hiking. It adds to the research in Europe that has found that xxxxx has a range of impacts on vegetation. The inclusion of soil seed bank data adds to the value of the current study as there are few studies of the impacts of recreation on seed banks compared to those just examining above ground vegetation. The basic design and data analysis are appropriate including the use of ordination methods to compare composition data. The results are interesting and important, including having management implications particularly in relation to restoring these xxxx. In enjoyed reading the paper and found it well written, referenced and clear. I have only a few minor suggestions for improvement.
I have made some minor changes to the wording and suggested three additional references that the authors may find useful on the PDF of the paper. Two important changes required before publication are (1) fixing figure 3 which is currently the same as figure 2, and adding the supplementary material which is currently not attached to the document. As a minor point for future work, I recommend the researchers start visually assess cover to a 1% accurately in the 1 m quadrats. This is quite easy with a bit of practice and provides greater accuracy in your measures than the Domin scale.

Here is another example where the paper was beautifully written.

This is a well written paper reporting on interesting experimental and observational data. I found it a pleasure to read. It contributes to our understanding of what factors might be limiting the upward migration of xxxx in mountains. I have made some minor corrections to the text to improve the flow, but otherwise feel that the paper is ready for publication in its current form.

Here is example where the recommendation was to reject the paper
A short version....
I recommend that this paper is rejected and the author(s) submit it soon to a more specific journal.

This is an interesting paper that describes the presence of xxx growing in the xxxx area. The publication of this information is important, adding as it does to our knowledge of the flora of this internationally significant botanical area. It also adds to the literature on xxx plants. My reservation, however, is that in effect this is a record of occurrence – e.g. these plants were found certain locations and hence it would be more appropriate in a local botanical journal with relevance to the region, such as the xxx, or xxx. More detailed research should follow on from the

finding of these species, including examination in more detail of the habitat they occur in, examination of the physiology of the plants etc.

In terms of the structure of the paper as it currently stands, it needs some work.

In particular the Discussion currently accounts for more than 50% of the text, starting on page 4 and finishing on page 11. The first part of the discussion is a list of the species found and their characteristics. This information could be included in a table and certainly constitutes results rather than discussion. The section in the discussion on the distribution of xxxx is interesting, but still in the form of x found y with several paragraphs starting out with Author (date) found….. The section on recreational and management impacts is interesting and useful.

Here is an example were I have very detailed feedback on a paper I recommended for rejection

This study compared the xxx xxxx, along with species richness and Shannon Index between a xxx and xxx in xxxxx in the USA.

It found that xxxx, and that the change in xxx was greater from xx in xxx than xx, and that species richness declined in x in xx quadrats but not in xx quadrats.

The papers suffers from many limitations, the three most important are:

1. *It appears to be an experiment in search of a reason. – the immediate hypotheses, that the number of xxx and growth of xxx will be lower for areas that are xxx compared to xxx is clear, and obvious. However, why such a result is of more than local interest is not based on what is presented here. Although it is not very clearly articulated in the introduction, it appears that one of the aims of this study is to test how xxx respond to xx, with x used as a surrogate for x. A second hypothesis and set of measurements – looked at how species richness at the site responds to xx r – with this suggested as a test of the intermediate disturbance hypothesis. However, the link between the results and either theory is not clearly presented in either the introduction or the discussion.*
   A much simpler and more direct hypothesis that could be tested with the data is that modification of the environment for this type of xxuse has a range of negative effects on vegetation – including on growth and reproduction of the dominant (xxx) but also on other species (the data on species composition that appears to have been collected but not analysied in much detail). There are many studies that have compared different aspects of vegetation in sites disturbed by xx use with controls that could be used as a model for the way in which the argument could be developed and the data analysed.
2. *Aspects of the design used seem odd without some explanation – such as why measurements were made over different months and two years. Presumable measurements were made in different months to assess how xxx growths over time - it would have been good to have a hypothesis relating to this – that the effect of xx in the previous October, may be more apparent during some particularly months – e.g. when conditions were warmest - or when the species started growing or whatever would seem most likely in this type of environment and for this species. From the data it does appear that the peak period of increasing length is xxx. Also the*

use of data from two years should be justified at least in passing e.g. something along the lines of " to ensure that the results were not specific to a single year, the experiment was repeated in a second year". Also, it would have been interesting to report on more than just the month * treatment effect – e.g. was growth greater in one year than the other? Also the study could have looked at relative growth rate not just absolute change in xxx – again making more out of the data and seeing if the effect was more general.

The data presented and analysised about the composition of the quadrats is very limited compared to what could be analysised. Why is no information provided on the individual species recorded in each quadrat including the total number of species recorded over all quadrats, their growth form (graminoid, herb, shrub), the area of bare ground, rock etc in each quadrat, how many species were native, the cover and frequency of each species per quadrat. Why did species richness decline between xxx? – were the measurements made in the same quadrats? – were they permanently marked ?– in which case its time series data and a repeated measure ANOVA might be more appropriate. Also the most interesting question appears to be which species were lost xxxx and which then can back in xxxx and why – your discussion discusses how one species may be contributing to the higher species richness in xxx, but that does not explain the decline and then recovery in species richness in xxx quadrats between the three months of measurement. A lot more could have been made of the composition data as an example of how xxx use adversely affects vegetation including analysis of the composition data between treatments and over time.

3. *The document is poorly written and justified. It took several readings to work out what was actually measured, analysed and reported on. The linking between paragraphs in the introduction and discussion was poor, and did not present a coherent argument for why the study was of interest, or the results were important in relation to the literature. The discussion went way beyond the data in terms of what was found in the study vs the reasons ascribed to the results. Also some sections of the discussion were repetitions of the results.*

These problems reflect the issues highlighted in the first point – the aims of the study beyond the immediate issue of the effect of xxx on xxx and species richness was not convincing. Unfortunately this paper was just not ready to be submitted to a journal both in terms of content and presentation.

By incorporating the suggestions made here and changing the focus of the paper it may be possible for it to be published, but not without considerable work and more analysis of data collected but not included in the current manuscript.

There are other issues with the paper including: (listed detailed feedback on certain sections including figures, references etc.

When responding to reviewers comments remember to be positive. Thank the reviewers for their positive comments (there will almost certainly be some). On issues of trivia, just roll over. If they want one of their papers cited (and this is very common, so much for anonymous review!) just do it. If reviewers have totally misunderstood what you have written, then explain gently to the editor that they have done so but in addition reword the offending sentence or paragraph. If an expert reviewer has totally misunderstood what you are trying to say then it is possible that may be an idiot, but a more plausible and acceptable explanation is that you didn't write the sentence or paragraph

sufficiently clearly. If the reviewer was confused, then you can be sure that a substantial proportion of the readership would be confused as well.

Go through the reviewer's statements one by one. One thing that is very frustrating for journal editors is if it is unclear where and how the author has responded to the reviewer's comments. Reviewers will often refer to line numbers and page numbers on the original manuscript, but these will often no longer be sufficient to identify where the changes are on the revised version. So it is a good idea to identify both the page and line numbers for the reviewer's comment on the original manuscript and also where the change is (page number and line number) on the revised manuscript. Where you have made changes in response to the reviewer's comments, say exactly what you've done. There may be occasional places where you simply reject the reviewer's suggestions as incorrect or inappropriate. In these cases, you need to justify not making any changes very carefully in the covering letter to the revision. Even if you reject the substance of the reviewer's comment, it is usually appropriate to reword the relevant section in the paper itself to clarify things or to justify why you took the approach you did.

Below are examples of reviewers comments on my papers, and my responses (in bold)

Suggestions for minor changes....

I had to go through the discussion to grasp what is meant with xxx. Please explain at this point already.

We have modified the text in the results section to clarify this point. It now states:

Px, Lxx-xx. Please provide more information about the sites: Are the xxxx? xxx? Other factors that may affect xxx rates?

We have added the following text to Page 6 results to clarify the condition of the xxxx. 'xxxxxxxx (Pickering, author obs.)."
Pxx, Lxxx. I would use the word "Estimating" rather than "Simulating", which makes me think of spatial population dynamics.

We have changed the word simulating to estimating on Page 9 in the methods and on page 12 of the results.

Example where the reviewer used the specific questions asked by the journal.... (again responses are in bold)

Recommendation: Moderate revision

1. Does the subject of the manuscript fall within the scope of the journal?
Yes
2. Is this a new and original contribution? (For review articles this does not necessarily apply.) An old model applied on a new case study is not considered a new and original contribution.
Yes
3. Are the results of sufficiently high impact and global relevance for publication in an international

journal?

Yes

4. Are the interpretations and conclusions sound, justified by the data and consistent with the objectives?

Yes

5. Is the organization of the article satisfactory?

The article would benefit from less duplication and simplification of statistical tests and improved clarity in the results and discussion

We have modified the text in several places to clarify and simplify issues as suggested. However, for the reasons provided below, we have not been able to alter the statistical tests or remove some tables as suggested by this reviewer.

6. Does the manuscript demonstrate an awareness of other research on its topic?

Yes

7. Does the title of the manuscript clearly reflect its contents?

Yes

8. Is the abstract sufficiently informative, especially when read in isolation?

Yes

9. Are appropriate keywords provided?

I'm surprised that mountain biking is not included in keywords.

We have not included it in the key words as it's already in the title.

10. Does the introduction set the manuscript in an international context and show how it builds on previous work on the subject ?

Yes

11. Is the statement of objectives of the manuscript adequate and appropriate in view of the subject matter?

Yes

12. Are the methods correctly described and sufficiently informative to allow replication of the research?

Yes - but would benefit from simplifying analysis. I'm not sure why the point intercept method is used rather than quadrat data (which provides more detail on species and cover)

Point quadrats are a commonly used method to obtain accurate cover data, particularly for herbs, shrubs and graminoids. It is an alternative to visual estimations of cover in quadrats and has already been used to assess trampling impacts using modifications of the Cole and Bayfield methodology (e.g. Hill, R. and Pickering, C.M. (2009). Differences in resistance of three subtropical vegetation types to experimental trampling. Journal of Environmental Management. 90:1305-1312.)

13. If a model is presented, is the model presented in sufficient detail (including calibration, sensitivity analysis and validation) to allow the reader to develop and test the model?

n.a.

14. Are the results clearly presented?

Yes

15. Is an appropriate statistical treatment of the results given?
The results could be simplified by presenting only the significant results of the different cover classes. The pairwise tests seem a simple and elegant way to test and present results.

Prior to conducting the experiment we were interested in some specific pair wise tests, particularly comparing across and down slope and comparing 500 passes with a mountain bike and hiker. These comparisons, therefore, could be analysed using as sets of a priori paired t-tests. However, we could not use pairwise tests to compare all other combinations of treatments, as this would increase the risk of Type 1 errors where the p value indicates a significant difference but there is no significant difference (Underwood, A.J. 1997. Experiments in Ecology. Cambridge University Press, Cambridge). This is why we used One-Way ANOVA to see if there was a treatment effect, and then used Tukey's post hoc tests for each pair of treatments. Tukey's post hoc test is more appropriate test for multiple pair wise comparisons on data collected from the same experiment.

We recognise that including Tukey's P values for all the combinations of treatments for all the different dependent variables resulted in several tables. We used bolding for the significant pairs to make it easier to see the significant combinations. We can, if the editor requests it remove all the non-significant p values, although that will not reduce the number of tables, just the number of values in each table. We have not done so, as leaving them in allow the readers to see if any were 'close' to significant (e.g. say between 0.005 and 0.01).

16. Are the results duplicated in the figures, tables and text?
Yes - possibly more than necessary. It would be easier for the reader if the significant results were indicated on the figures and explained in the captions. This would make some of the supporting tables redundant.
We tried this originally using letters above each value in the figures to indicate which treatments were significantly different to each other using the Tukey's tests. However, when we got to four letter combinations, we realised that it was going to be far more confusing that including the P values for the Tukey's tests in tables.

Where experiments have just compared a single activity but different intensities as is commonly done for hiking, the graphs and post hoc tests are often fairly straight forward. Here, because two activities and different levels of activity are being compared, the combinations of treatments are more complex. It's the nature of the beast when comparing level of use and type of activity in a single experiment, but it also increases the power of the analysis, and the usefulness of the results for management.
17. Are the figures and tables all necessary and are the captions adequate and informative?
The detailed location map of the study sites would be better shown as an inset into a location map showing where Kosciuszko National Park is - especially for an international journal.

We have included the insert as suggested into Figure 1.

Figure 2 - the caption & figure suggest that the slope treatments overlapped with other treatments (when looking at spacing and length of transects) - true?

They do not, and we have modified Figure 2 to more clearly show the three meter gap between each transect and how the slope treatments do not overlap with the treatments parallel to the slope.

Figure 5 - no key is given for the symbols.

We have made the change to the text for the figure as recommended.

Fig 8 - not sure that this adds anything to the text presented.
We think this is an important figure as it highlights the variation in sensitivity of different vegetation parameters to this type of disturbance. This is an important for research and management as choosing a parameters will therefore effect at what level of use impacts will be detected, and hence may alter management responses (restrict use or not etc).

18. Can any of the tables or figures be combined?
As above - I think the different cover class results could be presented more simply, with more information on statistically significant results in figures and therefore a need for less tables.
As mentioned above, we tried this, but found that it was even more difficult to keep track of which combinations of treatments using just the graphs.
19. Is the length of the manuscript appropriate to the content?
Yes
20. Are the references adequate for the subject and the length of the manuscript?
Yes
21. Is the quality of the English satisfactory?
Yes - except for the frequently used term 'top cover'. I think this is meant to be 'uppermost layer' or 'tallest strata' - the more appropriate technical term should be used throughout the text and figures.
We have changed 'Top cover' to 'Absolute cover 'as that term is commonly used. We avoided 'tallest strata' or 'uppermost layer' as the value was always a cover measure and just talking about tallest strata or uppermost layer may have resulted in some readers confusing these values with vegetation height. Absolute cover has been used in other papers published in xxxx.
22. Can you suggest any reductions in the manuscript, or deletions of parts?
No.

And here is an example where we argued against a reviewer's recommendation for rejection and the paper was published because the editor agreed with us and not the reviewer.
Reviewer #2: The article is not suitable for publication in an international journal like xxxx. The review paper does not offer anything new or critical. Recreation ecology is emerging as an important research field, however, the review presented is too narrow in its geographic focus (Australia) to suit international audience. The paper reports findings of previous studies conducted in Australia without a critical assessment of why the issue is important, how do the studies differ from, or are similar to, other studies conducted internationally, most notably in North America. There is no discussion on current direction(s) on recreation ecology research, its emphasis areas, key findings on influencing variables, e.g., relationship between use levels and impacts, new and innovative methods of impact assessment and monitoring techniques. The last two sections including the conclusion are particularly problematic; the conclusion section is poorly written and

needs to be more elaborated. The author makes no distinction between the terms "tourism" and "recreation." There are some typogrpahical errors too.

Based on the above comments, I reject the paper.

Our response

We fundamentally disagree with the comments of reviewer 2.

Firstly examining the impacts of tourism for an entire continent could not be in any way considered to be too narrow a geographic focus with Australia having a land mass equivalent to that of North America. Also, as outlined in the paper, the flora and fauna of Australia is considered to be internationally significant with Australia identified as a biodiversity hot spot due to the high levels of endemicism, and specific ecological adaptations. Finally, fifteen of the protected areas in Australia are considered of such high conservation status that they are now World Heritage Areas, and much of the research described in this paper is conducted in these areas.

Although there has not been as much recreation ecology research in Australia as in North America, the results of the Australia research are internationally important, adding to our understanding of impacts in a range of ecosystems including coral reefs, rainforests, etc. Also, Australian research is at the forefront in examining the importance of indirect impacts. Several studies we describe have also tested basic recreation ecology theory challenging overseas assumptions. Finally, the international significance of this research can be seen in the types of journals in which it is published, including several studies published in the Journal of xxxx itself.

While we have made reference to overseas studies where relevant, the purpose of this review was to show what was happening in Australia, not to do a comparative review of Australian and North American research.

We have corrected the issue identified to do with the terms tourism and recreation often using the terms to visitor and visitor impacts as required.

We have updated the last two sections of the paper incorporating many of the useful points made by the other two examiners. We feel that as a result the paper is a strong and important examination of visitor impacts and an appropriate topic for this international journal.

Here is a nice example of using a table layout for your response to the reviewer's comments used by a colleague of mine.

Reviewer	Comment	Response	Section of paper
1	The authors did a great job reviewing wide range of papers.	We appreciate the positive feedback	No revision necessary
1	The evaluation criteria are a very good a comprehensive choice.	We worked hard to use an inclusive set of criteria. However, reviewer 2 questioned several of these criteria. We have addressed reviewer 2's concerns below.	See comments for reviewer 2.
1	The authors present many long tables. Why not include a map?	We have now included a map illustrating our findings showing the geographic distribution of xxx and bar diagrams showing the various aspect wise distribution (continents, climatic zones, methodology, research strategies and assessment methods) of the xxxx research papers.	Fig. 2 and Fig. 3
1	Consider incorporating the review paper of xxxx	We have considered and incorporated the paper.	Lines 8 of page 3 Section: xxxxx
2	This manuscript descriptively discusses the literature.	No it is a quantitative review. For other published examples of such reviews and their strengths, see xxxx.	No revision necessary
2	This is a novel topic and of interest to readers	We appreciate the positive feedback	No revision necessary

Conclusions

I hope you have this document useful and feel more confident about writing and submitting research papers in Ecology. Although there are small and sometimes large differences in styles etc between journals, much of the information provided here is generalisable to a range of disciplines/journals, but always remember to check the instructions to authors and examples from the journal and talk to you supervisor. They will have far more experience than I in the particularly area you are working (unless you are one of my students).

Good luck and happy publishing !

Acknowledgments

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