

Methods paper

This assignment is designed to help you explore one of the methods used in population and community ecology more thoroughly. We would like you to identify an ecological method that interests you. You may use any of the methods we have covered in class or read about in Krebs, but do not feel constrained to these sources because the primary goal is to find a method that has some utility or interest to you. Please discuss your topic choice with one of the instructors before you begin your research or writing. Once the topic is approved, it is your job to become an expert on that method.

You will start by researching the history and applications of your method using the primary literature as your main source of information. You will then write a 7-10 page (double-spaced) review of the method. The exact style you use to write the review is up to you, but you must cover all points in the outline (see below). The journal *Trends in Ecology and Evolution (TREE)* has a number of good examples of methods reviews and may be a good place to start.

Due Dates

Preliminary meeting by Friday, November 14th
Final paper due on Friday, December 5th (or later)

Outline

Provide a historical and ecological background of the method. Important points to cover include the method's inventor, the first time it was used, the original question it attempted to answer, and the ecosystem or area it was first used in.

Discuss how has this method changed from the time it was first created. Review who has critiqued it and what changes they have offered. If the method's use has changed over the years (e.g. is it more or less popular, it is used in new systems, etc.), discuss the reasons for this.

Give three detailed accounts of the use of this method in the primary literature. You can select the papers for any number of reasons (e.g. chronological order, by topic, etc.), but they must be original scientific research and fit into the coherent framework of your review. Briefly summarize the main points of each paper and discuss how the method helped the authors address their question of interest.

Tell us your opinion of the method. Let the following questions serve as a guide, but do not feel constrained to just these questions: How hard or easy is it to use? Is it the best method for answering the ecological questions or are there other better methods? What changes might you suggest? What is the future of this method? Is the cost of the method (labor, equipment, supplies) prohibitive to its broader application?

Examples of topics

- The use of mist-netting in bird censuses
- Aerial surveys for large mammal population estimates
- Toe-clipping (or other marking techniques) in mark-recapture studies
- Use of stable isotopes in ecology
- Review of a problem, e.g. effective methods for sampling mycorrhizal fungal diversity
- Methods for measuring light availability
- Assessing soil nutrient availability

Example articles (may be useful for topic ideas or as examples of method reviews):

- Berthold, P. 1976. Censuses in ornithology survey and critical review. *Journal fuer Ornithologie*. 117(1): 1-69.
- Eberhardt, L. L., D. G. Chapman, and J. R. Gilbert. 1979. A review of marine mammal census methods. *Wildlife Monographs*. 63:35-46.
- Kerr, J. T. and M. Ostrovsky. 2003. From space to species: ecological applications for remote sensing. *Trends in Ecology and Evolution*. 18(6): 299-305.
- Taylor, Andy F. S., 2002. Fungal diversity in ectomycorrhizal communities: sampling effort and species detection. *Plant and Soil*. 244:19-28.
- Thompson, W. L. 2002. Towards reliable bird surveys: accounting for individuals present but not detected. *The Auk*. 119(1): 18-25.

Writing tips

- Use journals like *TREE*, *Ecology*, and *American Naturalist* as models for writing style. Write for a professional audience.
- Avoid excessive quotation. You should be able to neatly summarize the relevant points from papers you are using as background for your review. In general, discuss the ideas in the papers and not the papers themselves [not “Paper 1 had a good alternative to the method while paper 3 did not.”]
- Write clearly and carefully
 - Avoid passive voice in your writing (see us if you need clarification).
 - Be organized. Start from an outline.
 - Make sure to edit carefully. Use a spell-checker if you have a computer. Plan on cutting out unnecessary or redundant sections. Plan on adding sections to clarify key points. (This is a normal part of the evolution of any paper). Do not hand in a first draft!
 - Have someone proofread your paper.
- Support all of your statements, preferably with scientific evidence from the primary literature.
 - If you are guessing or making an arbitrary judgment, say so. Admit to uncertainty in your or others' conclusions.
- Present your paper in good form: underline/italicize scientific names and use the literature citation format of *Ecology*. Cite all sources, each time you mention ideas or data attributable to them. Include all (and only) references cited in the text in the “Literature Cited” section.
- Use 12-point font (preferably Times or something similar). Use 1-inch margins on all pages and please do not write more than 10 double-spaced typewritten pages.
- The grade will be based on our assessment of your critical thinking abilities, the originality of your treatment, and total idea development.