

Assignment 4 – Ecology Research Paper

Due Dates: First draft due – 20 October; Final draft due – 8 November.

Your 4th assignment is an in depth research paper on the ecological topic of your choice. This assignment will expose you to the major style of scientific communication – the scientific research article. You will follow the standard form for scientific articles; however the topic will be yours to choose. Here are some guidelines:

- 1) The paper must be address a contemporary ecological research question. This excludes general environmental policy issues (e.g., no papers on the general topic of global warming) but could include ecological questions related to environmental issues (e.g., the influence of acid precipitation on stream biogeochemistry or insect community dynamics would be appropriate).
- 2) You **MUST** discuss you question with me. Do this soon! I will help you develop a question appropriate to this assignment.
- 3) The question can be drawn from any area of ecology: physiological, population, chemical, ecosystem, landscape, etc. The most interesting may be questions that link two areas of ecology. For example: how do fish population dynamics influence ecosystem processes?
- 4) The paper should be 8 to 10 pages in length.
- 5) The paper should include an introduction, methods, results, discussion, and literature cited section. I will give you an example specific to your assignment below. The sections have the following general purposes:
 - Introduction – introduce the topic, state the question, thesis, hypothesis, or idea to be explored, present essential background information, and outline the remainder of the paper. For this paper you should use the introduction to set up the question you wish to address and explicitly state your question.
 - Methods – describe the methods used to test the hypotheses or answer the questions outlined in the introduction. Here you should briefly outline the methods used by others to answer the question you have chosen to focus on.
 - Results – present the results of the study. You should use the results section to present the data and analysis from the literature that helps you answer your question. If you can, try to take data from a number of papers and reanalyze them to produce a new summary. **DO NOT** simply regurgitate data from other papers. This should be a new synthesis guided by the published work of others.

Discussion – a broad discussion of your results. The discussion often places results into a broader context; this should be the same context set up in the introduction. The discussion should be the largest section in your paper.

Literature cited – an alphabetical listing of all of the literature cited in your paper. Only articles cited in the text of the paper are included in the literature cited.

6) The paper must be well referenced with articles from the primary literature. The primary literature is composed of articles from journals that have been peer reviewed. These include: Ecology, American Naturalist, Oikos, Oecologia, Trends in Ecology and Evolution, and many others. Primary literature does not include (with few exceptions) items published on the web, EPA documents, US Fish and Wildlife reports, newspaper articles, etc. Well referenced means you have pulled ideas and facts from multiple citations to support your synthesis. I cannot tell you how many citations this should be (it will depend on the topic), but I would suggest an average of 1 to 2 new citations per page (about 10 to 20 total articles in your literature cited) would be appropriate.

Back to major formatting issues – Here is a rough outline of a hypothetical paper. Your paper will need to be much more explicit throughout.

Introduction:

- Birds can be important nutrient vectors.
- Many examples of birds moving or recycling nutrients, but no general theory for when birds might have important impacts on local or regional nutrient cycles.
- Give a few examples of how birds move nutrients and introduce some of the factors that might be important. Briefly introduce how these factors might interact.
- Here I will address the question: what biotic and abiotic factors influence the importance of birds as nutrient vectors on local or regional nutrient cycling.
- I found that X, Y, and Z are the most important factors influencing the impact of bird-borne nutrients on local nutrient cycles.

Methods:

- There are three major approaches to estimating the impact of bird-borne nutrients on local nutrient cycles
- Approach one is ... Its strength/weakness is ...
- Approach two is ... Its strength/weakness is ...
- Etc.

Results:

- Study X found this ...
- That was similar to what study Z found ...
- Using data from all of these studies, it appears that factor Z is most important factor ... (Table 1 or Figure 1 – you can and should use a few tables or figures to summarize information that is hard to put in words).

- When Z is low, however, X becomes more important ...
- Q influences X by modifying ...

Discussion:

- I found ... (a strong statement or paragraph that re-iterates your major findings)
- Here is what it means ... (the core of your discussion – a place to discuss the interesting or important issues you did not have room to address in the introduction or were not appropriate to put into the results)
- The answer to my question is ... (Bring things back around to the introduction – make sure the message of your introduction and discussion match)
- The broad implications for A, B, and C are ... (broaden the discussion. Tell the reader how your work relates to more general topics – explain why they should care about this topic)