

The Scientific Literature

NRC 601

Research Concepts in Natural Resources

Department of Natural Resources Conservation
University of Massachusetts Amherst

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A literature review could be considered the backbone of your proposal.

The literature review serves several important functions:

1. Ensures not "reinventing the wheel".
2. Gives credit.
3. Demonstrates knowledge of problem.
4. Demonstrates understanding of theoretical and research issues.
5. Provides a critical evaluation of relevant literature.
6. Provides an integration and synthesize of existing literature.
7. Provides new theoretical insights or develops a new model as the conceptual framework for your research.
8. Illustrates significant and substantial contribution.

From P. Wong, How to Write a Research Proposal, Trinity Western University
[http://www.meaning.ca/archives/archive/art how to write P Wong.htm](http://www.meaning.ca/archives/archive/art%20how%20to%20write%20P%20Wong.htm)

Many literature reviews suffer from the following problems:

- Lacking organization and structure
- Lacking focus, unity, and coherence
- Being repetitive and verbose
- Failing to cite influential papers
- Failing to keep up with recent developments
- Failing to critically evaluate cited papers
- Citing irrelevant or trivial references
- Depending too much on secondary sources

From P. Wong, *How to Write a Research Proposal*, Trinity Western University
http://www.meaning.ca/archives/archive/art_how_to_write_P_Wong.htm

The Literature - Primary Sources

- (1) In a recognized serial publication or journal (4-6 x a year).
- (2) Usually very topic specific to the profession they represent.
- (3) Permanent and retrievable, even if the series is discontinued.
- (4) 2-3 anonymous reviewers, an Associate Editor, the Editor-in-Chief.
- (5) Subscriptions are either by institutional and individual memberships.

Papers you cite must be published or "in press".

Journals - A Rating System

Prestige based on age, severity of review, high rejection rate, content:

- A. International - *Science, Nature, Ecology.*
- B. National - *J. of Wildlife Management, J. of Forestry.*
- C. Regional - *SW Naturalist, NE Naturalist, NW Science.*
- D. State or university - *Trans. of the Wisconsin Academy of Sciences.*

The Literature - Other Sources

- (1) Scientific books and book chapters - editorial review.
- (2) Symposium proceedings - less rigorous peer review.
- (3) Government reports and serial publications.
- (4) Annual reports, progress reports.
- (5) Theses and dissertations.

These sources are often referred to as "gray" literature.

The Literature - "Non-Sources"

- (1) Unpublished papers, reports, manuscripts.
- (2) Popular or semi-technical magazines (*National Geographic, Audubon, National Wildlife*).
- (3) Published or unpublished abstracts, posters, talks.

The Literature - Unknown or Undetermined

The World Wide Web

8 November 1996

E.g., Pierre Salinger and the downing of TWA Flight 800:

Salinger, an established and experienced reporter, claimed to have a government report, which was posted on the internet, stating that Navy gunners accidentally shot down TWA Flight 800 while conducting missile tests, killing all 230 people aboard.

FBI later said there was *"not one shred of evidence that it happened or it could have happened."*

Therefore, don't trust everything you see on the Web.

Finding and Citing Literature

An example using www.jstor.org

“African American Studies” (13 journals) to “Zoology” (47 journals)

“Biological Sciences” (179 journals)

“Ecology and Evolutionary Biology” (55 journals)

“wetlands” - 15,606 citations

“moose” AND “exclosures” - 164 citations

(need to narrow down your search, based on your question)

Pastor, J., B. Dewey, R. J. Naiman, P. F. McInnes, and Y. Cohen. 1993.

Moose browsing and soil fertility in the boreal forests of Isle Royale

National Park. *Ecology* 74:467-480.

Citing Literature: Context & Style

CSE = Council of Science Editors
(formerly CBE = Council of Biology Editors)

- name changed on 1 January 2000
- CBE established in 1957 by NSF and American Institute of Biological Sciences
- publishes the “Style Manual”:

CSE. 2006. Scientific style and format: the CSE manual for authors, editors, and publishers. Seventh ed. Council of Science Editors, Reston, VA. 658pp.

Citing Literature in Text

- Examples of citing literature in body of the manuscript:

- . . . are involved in population cycles (Keith 1960).
- . . . are in the diet (Squires and Ruggiero 2007)
- . . . from several locations (Schwartz et al. 2004).
- . . . large geographic areas (Keith 1963, Royama 1992, Krebs et al. 2001).
- . . . According to Keith (1963) . . . (or) Keith (1963) stated that . . .
- . . . are widespread (Keith 1963, 1974; Smith 1965; Jones 2009).
- . . . when hares are scarce (Buskirk et al. 2000a).
- . . . when hares are scarce (Buskirk et al. 2000a, *b*).
- . . . lynx depend on old-growth (Defenders of Wildlife 2007) is spurious.

The Literature Cited Section

(next assignment - 5 references in this format)

- Brand, C. J., and L. B. Keith. 1979. Lynx demography during a snowshoe hare decline in Alberta. *Journal of Wildlife Management* 43:827-849.
- Carroll, C. R., R. F. Noss, and P. C. Paquet. 2001. Carnivores as focal species for conservation planning. *Ecological Applications* 11:961-980.
- Keith, L. B. 1963. *Wildlife's ten-year cycle*. University of Wisconsin Press, Madison, USA.
- McKelvey, K. S. 2000. Theoretical insights into the population viability of lynx. Pages 21-37 *in* L. F. Ruggiero, editor. *Ecology and conservation of lynx*. University of Colorado Press, Niwot, USA.

Citing Web Sources

(An example from the *Journal of Wildlife Management*)

Defenders of Wildlife. 2007. Lynx background and recovery. <http://www.defenders.org/programs_and_policy/wildlife_conservation/imperiled_species/lynx/background_and_recovery.php?ht=>. Accessed 25 Jul 2007.

FYI:

http = Hypertext Transfer Protocol (HTTP)

www = World Wide Web (WWW)

Download Reading from Web

www.jstor.org

- likely available from other literature search engines
- must be on a UMass computer or go through the UMass router
- search on McPherson as author + Teaching and Learning the Scientific Method as title or text
- find and download the following article:

McPherson, G. M. 2001. Teaching and learning the scientific method.

American Biology Teacher 63:242-245.