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FOR 271.01: Wilderness Ecology

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Wilderness Ecology Forestry 271

Syllabus and background information, Fall 2008

Instructor: Paul Alaback; Office Science Complex 404

Office hrs: TBA

email: palaback@forestry.umt.edu

Natural history guide: <http://bioed.org/nhguideweb>

Class website: ERES system through library reserve (password=FOR271)

Class meets 10:40-12:00 MW; Rankin 203

Format Will have lectures/ discussions twice a week including several guest speakers. Themes discussed in lecture will be supplemented by some of the Friday labs as well, and we will have field sessions for one of the class periods this year (coordinating with the 273 class). We will mostly rely on readings from the text, as well as current ecological and conservation literature. Materials will be available on the library web site (ERES).

Course objectives: provide general overview of ecology and its application to environmental issues, especially those that relate to wild landscapes. We will also provide examples of appropriate uses of science in improving public policy and decision making, and discuss how people fit into ecosystem processes and functions. Our key objective will be to help students better develop their skills in **thinking ecologically**.

General theme of course will be that knowledge of the basic ecology of a bioregion gives a foundation for a better understanding the patterns in nature and the principal reasons for these patterns; this knowledge is critical to develop clearer thinking about the relationships between people and nature, and our place in the cosmos. This leads to a better appreciation of nature and natural processes, and also should lead to more realistic and successful conservation and management programs and activities.

Preparation. There are no prerequisites for this class other than being in the wilderness and civilization program, in the honors program, or to have special permission from the instructor. Students with more advanced training in science may want more detailed background reading for some topics. Just let the instructor know about this.

Student papers

One term paper, and two short papers will be part of course. The term paper will be to take an area you know well, such as where you grew up and to describe ecological conditions (composition, structure and function) before European settlement then provide a scientific argument (backed up with scientific literature citations) for what have been the most significant ecological changes and why. This will require drawing upon a variety of sources for the historical portion, but will require reference to the scientific literature (journal articles) in the second part. In total this should be approximately 10 pages double spaced, not including references. The other papers are a critique of a scientific paper (ideally one that you will use for your term paper) and a critique of a film we will see and discuss in class.

Grading: 1/4 midterm; 1/2 class papers (& participation); 1/4 final

Key ideas:

Everything is connected

You can not truly know a system without going outside the system.

Change is the norm.

Ecosystems are more complex than you can imagine, or

Ecosystems occur across all scales of space and time and are a product of these as well; we must expand our thinking and our perceptions across these scales to understand the processes that maintain ecological patterns.

We cannot go forward or understand where we are going, unless we can understand where we have been.

Policies

Assignments must be turned on in time. Unless special permission is granted beforehand assignments turned in late will have a 10% penalty in total points received.

Students are expected to have read assigned readings prior to class and to be prepared to discuss in class. Always bring at least 1-2 questions from the reading to class so that we can have more useful discussions.

All students are expected to make thoughtful critiques of scientific papers and ideas. While the text should serve as a good general background for these ideas, if students find they need more background for particular topics they need to raise these issues and class or contact the instructor so that more background reading, or extra discussion in class can be arranged.

Exams

Students that cannot take exams at the assigned times must contact the instructor at least a week before the exam. Makeup times will be at 8:00 Monday morning following the assigned date for the midterm. Special arrangements will be made for final exam.

Format for written assignments

It is critical that students master the scientific or technical format for writing assignments in this course. Central to this format is clear documentation of the source of ideas or data so that the reader can clearly understand where your information comes from (personal observation, experience, a particular published reference, a synthesis of several references, a lecture, a field trip, data from a website, etc.). For example the statement "In my opinion, this is the way it is, or this is the critical factor..." has no place in scientific writing. The point is not what your "opinion" is but how did you reach that opinion? How strong are your data, or how compelling is your logic? What alternative explanations are there, and why do you feel they are less likely to be correct than your chosen conclusion?

All students must practice academic honesty. Academic misconduct is subject to an academic penalty by the course instructor and/or a disciplinary sanction by the University. All students need to be familiar with the Student Conduct Code. The Code is available for review online at <http://www.umt.edu/SA/VP/SA/index.cfm?page?1321>

A. Kinds of sources of scientifically credible information

1. Peer-reviewed journal articles. These are scientific articles published in journals which have been critically reviewed generally by at least 3 scientists that are well-established experts in this field. Peer-review helps ensure that the information is new, significant and accurate. Of course this is a human enterprise, and mistakes can be overlooked, and problems may occur, but in general information in these publications has the highest level of accuracy of any of your potential sources. For this class journals that should be particularly useful and are available electronically and also in hardcopy form in our library include:

Conservation Biology*

Ecological Applications

BioScience*

Biological Conservation

Restoration Ecology

Science

Western North American Naturalist (go to their website)

Frontiers in Ecology and the Environment*

Forest Ecology and Management

*These journals are particularly easy to read, are intended for more general scientific audiences so are particularly good references for this class.

2. General magazines with articles written by scientists. These can provide useful general information about your topic, and introduce key ideas. These can be good references but by themselves are not sufficient to provide an overview of scientific information on a topic. Examples include:

Natural History

Smithsonian

Scientific American

3. Scientific books. Publishers such as Springer-Verlag, Academic Press, and university presses have published many scientific books which generally have peer review and often provide useful information. Good examples include the Ecological Studies series by Springer. Floras, such as the Flora of the Pacific Northwest, and the Flora of Montana are excellent scientific books for this region. These are all listed in griznet on the library website.

4. Government publications. The US Forest Service, for example publishes many scientific papers which are located in the basement of the library, and will not generally be found in library website searches. For our region the Rocky Mountain Research station (formerly known as the Intermountain Research Station) have many useful publications in their General

Technical Reports series, and Research Papers series. These provide useful information, but are generally not well peer-reviewed, so need to be supplemented with at least some citations of peer-reviewed journal articles as well.

5. Websites. The web is the easiest, but generally the most unreliable source of information. The key problem is there is no consistent form of peer review, or way to judge accuracy. It is a great way to begin research on a topic, but by itself is generally not a reliable source of information. EXCEPTION: on the some websites such as our library you can download scientific published articles. Since these have been published, depending on where, they have the same accuracy and authority as the hardcopy versions. Also there are peer-reviewed online journals, that also have valuable accurate information that has been verified. Websites sponsored by scientific organizations such as universities, research institutes, or government agencies can also have valuable information that is much more reliable than other websites.

B. Format for citing sources

Students often do not properly cite scientific references, which often makes it difficult to evaluate their writing and clearly understand sources of information. In science, with only a few exceptions (like the journals, *Science* and *Nature*, which have a very special abbreviated format) the following citation format is required:

In text: summary statement...(Smith and Jones, 1953 (first reference); Tabia et al. 1999 (second reference), USDA Forest Service 2005,.....).

[note that if there are more than 2 authors you use the et al. reference to the other authors in the text citations, but then list all the authors at the end of the paper]

In References section at end of paper:

(alphabetical by author, then by date of publication)

Smith, J. and S. Jones. 1953. The causes of the biodiversity patterns in mountain ecosystems. Cons. Biol. 13:123-125. [note the first number here is the volume, then are the page numbers. Generally the issue number or month is not needed]

Tabia, H., Jones, S., Smith, J. 1999. Declines in species richness as related to forest microclimate. Biodiversity and Conservation 3:12-23.

*USDA Forest Service, 2005. Fire effects information system. Rocky Mountain Research Station, Missoula, MT. <http://www.fs.fed.us/database/feis>. Accessed 4/21/2004.

*Note in this example how to properly cite a website. Simply providing the address (URL) is meaningless to most readers. The critical thing to document is who is supporting or maintaining the website, where are they based, and when did you access the website (since websites are continuously updated). Websites maintained by private individuals are in general less reliable than those sponsored by government agencies, universities or other well established organizations. Also note that just because you downloaded a published article does not mean the website you loaded it from is the source. The source should be the publisher (e.g. the journal, or book publisher).

Footnotes: you should use footnotes for unpublished references such as lectures, personal conversations (called a personal communication), and websites.

How do I find sources of scientific information??

A. Get citations of potentially useful articles

The best resources are generally to search the library website. In particular go to the section (find an article) under research tools, then select forestry or biology. Databases that are generally best for this class are: Academic Index, Agricola, ISI Web of Science, and Biological Abstracts. You can search for references by author, by year, by keyword, works in title or abstract, or any combination. Ask the reference librarian for more information on this.

Another useful strategy is to find a general “review” article or book chapter that is somewhat related to your topic. This will provide a long list of references, which you can then look up. Also this will often identify the authors that are doing research on this topic, so you can then search the library databases for this author—often much more accurate and useful than keyword searches.

You cannot find useful scientific references by simply searching griznet on the library site. This only includes books, and other resources, but not journal articles.

Another easy way to find citations of publications and sometimes publications themselves is to use google scholar. (www.google.com/scholar). This is general faster than the library websites but does not cover as much material. This still requires in most cases that you go to the library website to then get electronic copies of the articles (see below).

B. Find physical copies of references (paper, or online).

The easiest way to get references is to search the online journals section of the library website. You can go to the journal section (under research tools), and enter the name of the journal. Then if the library has it, you can then click on the database listed and go straight to that journal. If the journal and year you are looking for is here, then you can simply download and print the article. Otherwise if it is listed as being in the library, you can go to the library, and xerox a copy from their collections. If the library does not subscribe to this journal, then you can request an Interlibrary Loan. You can do this online, and can get an electronic version delivered to your email address, often in less than a week.

The library and the university has greatly expanded resources for you to get scientific information in recent years. These provide a rich resource for you, and learning to use them well is a critical skill that should be of great value for all your future professional work.