Biol 821 – Fire Ecology

Research Paper Instructions:

Your paper will develop some aspect of fire ecology. Think of this as a review article that you might see in a journal, e.g., Trends in Ecology and Evolution. So, keep the topic narrow enough to cover fully in roughly 10-12 pages, but with an idea for how the topic fits into general ecological theory.

I don't intend for this to be a perfunctory "burden" to you, but rather an opportunity to develop and explore ideas. It's certainly logical and acceptable for you to focus on the same papers examined in your seminar, but not required if something strikes you as more interesting or important for you to write about. That's because I want you to stretch yourself as much as you're willing. By 'stretch' I mean I want you to push yourself into thinking about how the topics you're focused on in the paper fit into fire ecology, and how fire ecology fits into general ecological theory and its applications. Any area of research that involves wildfire is technically fire ecology, but that can reflect every aspect of ecological theory or approaches; from nutrient or hydro-dynamics to plant life history evolution to the dynamics of animal populations. I want your paper to be explicit about both the focal context and the theoretical context; if you're focusing on an applied topic (management, conservation), then how does the applied aspect reflect the theoretical underpinnings? What aspects of wildfire are critical to the dynamics of your focal group? Is wildfire just coincidental or are the long-term patterns a result of historical wildfire regimes, are their evolutionary aspects of population responses that reflect historical fire regimes? What are any ecological theories your ‘fire story’ might fit into? Consider the strengths and the weaknesses of any ecological frameworks or models that describe your ‘fire story’ and whether there may be alternatives.

Topic: Any topic that deals with Fire Ecology. If you focus on a particular set of papers, say around management of chaparral fuels, present the ideas, but also critique them (present ‘strengths and weaknesses’), indicating other work that supports the concepts and those that contradict. Also, don't focus on only the empirical results, except as data to interpret support for or against some aspect of a model. In other words, as a part of the discussion, try to place the papers into a general framework of fire models that together we think of as "ecological theory." Think of this as a way of allowing you to integrate the semester together for you. Suggest research directions this area may take in the future based on other topics that stimulated your thinking during the semester. If the concepts are applicable to your own research, reflect on that as well.

Format:

Title Page: Your name and the title of the paper.

Introduction: Spend one to several pages introducing your topic and why it’s significant (why anyone should read your paper). What are your ‘objectives’ or questions?

Example: Perhaps you want to explore why Keeley and Minnich have such different stances on fire management in chaparral. Obviously exploring the ideas in the papers are important, but also, in the introduction, what’s the context for their arguments? Why do we need to manage chaparral? What is your ‘objective’ in reflecting on the arguments these researchers have had over the last 20 years?

Example: Perhaps evolutionary aspects of fire intrigue you. How have life history or behavioral aspects of some group become selected by particular fire regimes? What is your objective in consider how fire is integrated into the life histories, the long-term population dynamics of the group you interested in focusing on?

Example: Perhaps you’re most interested in managing, conserving or restoring some set of ecological systems. How might ‘restoring’ historic fire regimes be an aspect of that? How does a manager approach fire regimes? What are the positives and negatives involved in such management approaches? Are there ‘alternative processes’ that might achieve the same goals? Set out in the introduction what your objective might be in considering fire as a process that must be integrated into management, conservation or restoration.
**Suggestion:** Regardless of what you decide, integrate into the paper a discussion of the historic fire regime for the system you choose.

**Middle of paper:** Organize the review and argument development around 3-4 principal issues. Each issue should be developed enough that it covers roughly 2-3 pages. These would incorporate reviewing what’s known, your vision of strengths and weaknesses of the area, and research that’s needed. These principal issues ‘answer or resolve’ the objectives you’ve established in your introduction. You can use ‘section’ dividers by topics of your arguments, rather than things like ‘Methods’ or ‘Discussion’.

**Conclusion:** This might be considered more of a synthesis rather than a reiteration of what you’ve just said. This is the place for you to pull together your arguments in the light of your objectives and create alternative ‘models,’ management or research agendas. Maybe you have a diagram or figure as a way to express your synthesis (I love visuals!). “Fire regimes” will definitely be an aspect of your synthesis.

**Literature Cited:** Oh, yes, primary literature only please, with full citations appropriate for a journal. Choose a journal, use their formatting scheme and be consistent.

**Other issues:**

*Citations:* use standard ‘author-year’ citations within the text. Try to keep them in parentheses as much as possible. If it’s someone’s particular theory or argument you’re discussing, then it does belong as a topic of the sentence (e.g., “Several neutral theories are now current (Hubbell 1977, 2001, Bell 2000, 2001, Liebold et al. 2004).” versus “Hubbell (2001) develops the concept of dispersal limitation and ecological similarity as key components of his neutral model.”) Otherwise, keep the citations parenthetical; that way, biology remains the topic rather than researchers.

*Rewriting:* First drafts are rarely any good (you’re not in high school anymore). Your ideas are there but often the development of ideas is spotty or you jump over key concepts. Use an outline, write a draft, polish it, and put it aside for at least 3-5 days. Then re-read it, thinking about how the ideas are developed, did you do a good job explaining your ideas/approaches/etc.

*A simple technique* to totally help you write better is to do this: When you’ve finished your draft, take another piece of paper, read the first paragraph of the draft, and write a brief phrase (not a full sentence) that captures the whole content/argument of the paragraph. Do this for each subsequent paragraph, so that you have a ‘list’ of brief phrases for the whole paper.

1) If you can’t capture all the content of a paragraph in a single brief phrase, then the paragraph probably has too many key ideas in it, and that means some of these ideas will be underdeveloped or in the wrong location. Reconsider the paragraph, it may need to be broken into more than one paragraph.

2) Ask yourself: ‘Does the first sentence of the paragraph incorporate/focus on the ideas found in the brief phrase?’ In other words, did you write an appropriate topic sentence? If not, rewrite an appropriate topic sentence and edit the paragraph.

3) Now read your list of brief phrases. Do they follow an argument, or do you cycle back occasionally to a topic already covered someplace else? Does your sequence make sense?

*Species names:* Remember, species names are Latin, and you’re writing in English. That means foreign words like Latin genus-species must be italicized or underlined. Double-check. (spaces between genus and species are ‘English’ and so not underlined)

*“Voice”:* Try to write in an active voice. Rewrite sentences with ‘may be’ or similar phrases into active tenses. **Totally avoid** starting sentences with “There is” or “It is” or anything close to them. Such sentences are too ambiguous and detract from your argument. When you’re finished writing, do a ‘search’ for those words and rewrite those sentences if necessary.