I. General Education Review – Upper-division Writing Requirement

<table>
<thead>
<tr>
<th>Dept/Program Subject</th>
<th>Wildlife Biology</th>
</tr>
</thead>
<tbody>
<tr>
<td>Course(s) Title</td>
<td>Conservation of Wildlife Populations</td>
</tr>
<tr>
<td>Description of the requirement if it is not a single course</td>
<td>A suite of courses fulfills the requirement for WBIO students, and this is one of them.</td>
</tr>
</tbody>
</table>

II. Endorsement/Approvals

Complete the form and obtain signatures before submitting to Faculty Senate Office.

<table>
<thead>
<tr>
<th>Please type / print name</th>
<th>Signature</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Instructor</td>
<td>Dr. L. Scott Mills</td>
<td></td>
</tr>
<tr>
<td>Phone / Email</td>
<td><a href="mailto:Lscott.mills@montana.edu">Lscott.mills@montana.edu</a></td>
<td></td>
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<tr>
<td>Program Chair</td>
<td>Dr. Dan Pletscher</td>
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III. Overview of the Course Purpose/Description

Conservation of Wildlife Populations will expose you to the scientific basis and practical applications of the study of wildlife population biology. The modern study of wildlife population ecology orchestrates a dance at the interface of reliable field work and the use of mathematical tools and population genetic techniques. Students will learn how to collect the data necessary to study wildlife populations, and how to assess the factors that affect population growth and interactions with other species. We will confront the complexity of interactions in the real world, emphasizing the feedback between biological processes but acknowledging the role of social/political constraints. By the end of the course, students should have the confidence to advance both management and research by effectively using data, models, and the ecological concepts to address pressing questions involving the harvest, monitoring, and conservation of wildlife populations.

IV. Learning Outcomes: Explain how each of the following learning outcomes will be achieved.

<table>
<thead>
<tr>
<th>Student learning outcomes</th>
<th>Lectures, class discussions, field trips.</th>
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<tbody>
<tr>
<td>Identify and pursue more sophisticated questions for academic inquiry</td>
<td>A substantial written research proposal is required (described in detail below). Also, an essay is required that connects science to a conservation issue from the Yellowstone field trip</td>
</tr>
<tr>
<td>Find, evaluate, analyze, and synthesize information effectively from diverse sources (see <a href="http://www.lib.umt.edu/informationliteracy/">http://www.lib.umt.edu/informationliteracy/</a>)</td>
<td>Discussion, written assignments</td>
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</table>
Recognize the purposes and needs of discipline-specific audiences and adopt the academic voice necessary for the chosen discipline

By definition, this is what we do in wildlife biology. I’m not sure what is meant by “academic voice”. Our students learn how to communicate in appropriate ways to audiences—researchers, managers, and the public.

Use multiple drafts, revision, and editing in conducting inquiry and preparing written work

Yes, we do this.

Follow the conventions of citation, documentation, and formal presentation appropriate to that discipline

Yes, proposal and essay assignment

Develop competence in information technology and digital literacy

Homework assignments

<table>
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<th>V. Writing Course Requirements Check list</th>
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<tr>
<td>Is enrollment capped at 25 students?</td>
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<tr>
<td>If not, list maximum course enrollment.</td>
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</table>
| Explain how outcomes will be adequately met for this number of students. Justify the request for variance. | □ Yes □ No  
No – enrollment is typically 20-40 students. The class has a TA. The professor and TA are able to sustain the requirement as a writing course bundled with other writing courses. |

Are outcomes listed in the course syllabus? If not, how will students be informed of course expectations?

□ Yes □ No  
Yes. The course expectations are very clear to the students, both in terms of what they will learn about and their expectations of work. See course overview and syllabus

Are detailed requirements for all written assignments including criteria for evaluation in the course syllabus? If not how and when will students be informed of written assignments?

□ Yes □ No  
Yes: see course syllabus and overview.

Briefly explain how students are provided with tools and strategies for effective writing and editing in the major.

Discussions with professor and TA, practice writing and peer review.

Will written assignments include an opportunity for revision? If not, then explain how students will receive and use feedback to improve their writing ability.

□ Yes □ No  
Yes.

Are expectations for Information Literacy listed in the course syllabus? If not, how will students be informed of course expectations?

□ Yes □ No  
In a general way, they are described. These topics are discussed in class and discussion section.

VI. Writing Assignments: Please describe course assignments. Students should be required to individually compose at least 20 pages of writing for assessment. At least 50% of the course grade should be based on students’ performance on writing assignments. Clear expression, quality, and accuracy of content are considered an integral part of the grade on any writing assignment.

Formal Graded Assignments

35% of course grade is assignments, which includes two short essays and numerous problems sets and short assignments.
20% of course grade is a grant proposal, which is peer reviewed and re-written; also both the first and second drafts are read by the professor.

Informal Ungraded Assignments

** VII. Syllabus:** Paste syllabus below or attach and send digital copy with form. The syllabus should clearly describe how the above criteria are satisfied. For assistance on syllabus preparation see: http://teaching.berkeley.edu/bgd/syllabus.html

Paste syllabus here.

** SEE 2 FILES: Syllabus and “Course Overview”, which contains more of the details you are looking for. **

Conservation of Wildlife Populations -- WBIO470
COURSE OUTLINE FALL SEMESTER 2008

Instructor : Dr. L. S. Mills

REQUIRED READINGS (*Please be sure to have reading done BEFORE class each day*)

- Conservation of Wildlife Populations
- **CHAPTERS TO READ FOR EACH CLASS ARE IN BRACKETS**
- Other readings to be assigned (On hard-copy reserve and ERES at Library)

Class meeting times (All required):

→ MWF 9:10-10 lecture (Janette Rankin 204)
→ Tues 11:10 – 12:00 (Journalism 106) Discussion / computer assignments
→ REQUIRED FIELD TRIP: Sept. 12-14

Part I: Conservation Context and How to Estimate Demographic Components

<table>
<thead>
<tr>
<th>August</th>
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<tbody>
<tr>
<td>Mon 25</td>
<td>care</td>
<td>Humans and wildlife population ecology: what is it and why you should</td>
</tr>
<tr>
<td></td>
<td></td>
<td>care</td>
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<tr>
<td></td>
<td>27</td>
<td>How many species exist, and “natural” and <em>current</em> rates of extinction</td>
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<td>[Ch. 1]</td>
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<td></td>
<td>29</td>
<td>How do we know what we know? Study design &amp; Hypothesis Testing[</td>
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<td></td>
<td>Ch. 2</td>
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<thead>
<tr>
<th>September</th>
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<tr>
<td>Mon 1</td>
<td></td>
<td>Labor Day Holiday</td>
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<tr>
<td>TUES 2</td>
<td></td>
<td>1st Discussion section meeting: talk about YNP Trip &amp; Assignments</td>
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<tr>
<td>3</td>
<td></td>
<td>Gaining reliable knowledge, continued [Ch. 2]</td>
</tr>
<tr>
<td>5</td>
<td></td>
<td>The National Lynx Survey as a case study: The science of non-invasive genetic sampling meets politics and ethics [Ch. 2 AND 3]</td>
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</table>
Mon  8      Introduction to Genetic Tools to identify species, populations, and individuals [Ch. 3]
      10  Poached salmon and other insights from genetic tools [Ch. 3]
      12  LEAVE FOR FIELD TRIP AT 9am

Mon  15     Estimating abundance I: Overview and transect sampling [Ch. 4]
      17  Estimating abundance II: Mark-recapture [Ch. 4]
      19  Survival, reproduction, and sex ratios  [Ch. 4]

Part II: Population Processes: The Basis of Applied Management
Mon  22     Estimating trend: Exponential Growth [Ch. 5]
      24  Exponential Growth, continued [Ch. 5]
      26  Why stochasticity lowers population growth  [Ch. 5]

Mon  29     Numbers can’t increase forever: Density Dependence [Ch. 6]
TUES  31    EXAM REVIEW

October
Wed  1      EXAM 1
      3  Density dependence, continued [Ch. 6]

Mon  6       How can math help us predict efficient management actions? [Ch. 7]
      8   Population projection models, continued [Ch. 7]
      10  Determining the most important vital rate: Sensitivity analysis [Ch. 7]

Mon  13     Modeling and Conservation Case Studies: sage grouse to bighorn sheep
      15  Do more wolves mean less elk? [Ch. 8]
      17  Predation continued [Ch. 8]

Mon  20     What is inbreeding and when does it matter for wild populations? [Ch. 9]
      22  Genetic Variation and Fitness, continued [Ch. 9]
      24  Why do animals move: measuring connectivity [Ch. 10]

Mon  27     When good animals choose bad habitats: sinks and traps [Ch. 10]
      29  Human perturbations that cause declines [Ch. 11]
      31  Deterministic human perturbations, continued [Ch. 11]

Part III: Addressing Problems With Small and Declining Populations
November
Mon  3      Special Problems with Small Populations [Ch. 12]
TUES  4     Election Day HOLIDAY
      5      EXAM REVIEW (in class)
      7      DRAFT of proposal due – peer review exchange in class
Mon 10 Prioritizing recovery actions for endangered species: Models meet on-the-ground perturbations.

Tues 11 Veteran’s Day HOLIDAY

12 Assessing Population Viability, continued [Ch. 12]
14 Focal Species to span single-species and ecosystem management [Ch. 13]

Mon 17 Merging Biology and Models for Harvested Populations [Ch. 14]
19 Harvest models, continued [Ch. 14]
21 Graduate Student Presentations

Mon 24 Graduate Student Presentations
26 - 28 Thanksgiving Holiday

December

Mon 1 Conclusions/Final Thoughts
(Épilogue)

3 COURSE EVALUATION
5 Field Trip Make-up – NO CLASS

December 10 FINAL EXAM, 8:00-10:00AM

CONSERVATION OF WILDLIFE POPULATIONS
(WBIO 470)
FALL SEMESTER 2008
Class Time: M, W, F 9:10-10 and Tues. 11:10-12

INSTRUCTOR:
Dr. L. S. Mills
Office: For 307 Phone: 243-5552
Office Hours: Tuesday 12-1
Friday 12-2
(or by appointment, arranged in advance)

TEACHING ASSISTANT:
Ellen Cheng
Office:
Office Hours:

COURSE OBJECTIVES
Conservation of Wildlife Populations will expose you to the scientific basis and practical applications of the study of wildlife population biology. The modern study of
wildlife population ecology orchestrates a dance at the interface of reliable field work and the use of mathematical tools and population genetic techniques. Students will learn how to collect the data necessary to study wildlife populations, and how to assess the factors that affect population growth and interactions with other species. We will confront the complexity of interactions in the real world, emphasizing the feedback between biological processes but acknowledging the role of social/political constraints. By the end of the course, students should have the confidence to advance both management and research by effectively using data, models, and the ecological concepts to address pressing questions involving the harvest, monitoring, and conservation of wildlife populations.

READING MATERIALS/TEXTS

Required Text: Mills, L. S. 2007. Conservation of Wildlife Populations: Genetics, Demography and Management. Blackwell Publishing, Oxford UK. (note: I won’t make any profit from sales to you!). Each lecture will draw, in part, from the readings assigned for that lecture, and you will be responsible for the concepts and principles presented in the readings. Don’t put off reading! Take notes to help understand and remember the reading.

Other readings, required and optional, may be assigned during the course.

GRADED WORK

As you’ve probably learned, you should not wait until the last panic-filled minute to start your work. For all graded work, please put your student ID number and the date at the top of the page, but not your name. This allows me to grade the work anonymously, avoiding any potential bias.

This course helps fulfill the University’s general education requirement for an upper level writing class; more importantly, your careers will depend on your ability to effectively present written documents detailing your observations and activities. Therefore, you will have ample opportunity to practice concise written communication while pursuing in-depth knowledge of particular subjects. In written assignments, the grade will reflect roughly equal emphasis on content/presentation/grammar. Follow the specified formats carefully. In the real world disregarding format instructions will lead to rejection of the paper or proposal, and loss of credibility; in this class it will mean lost points.

1. Assignments (35%): All assignments will be due at the start of class on the due date. No e-mailed assignments will be accepted. Unless otherwise indicated, assignments should be typed and double-spaced. Late assignments will be penalized 10% of the point value of the assignment for every day they are late.

   a. Essays (10%) – You will prepare two short essays for this course. These essays should be about 4 pages long and should address controversial, current topics in the conservation and management of wildlife populations. Further guidelines will follow.
b. Problem sets/Short assignments (25%) – You will work on a number of practical exercises throughout the semester during the Tuesday discussion section. These will include mathematical problems related to the course material as well as conceptual/interpretation questions.

2. **Exams (45%)** – This class includes two midterm examinations, each worth 12% of your final grade, and a final exam worth 16% of your grade. Exams will include material covered in the lecture as well as material from the book and other assigned readings. *Like life, exams are cumulative.* Exams cannot be rescheduled, except in the case of a documented medical emergency.

3. **Grant proposal (20%)** – Everyone will write a grant proposal on a research question related to applied wildlife population ecology. In the grant proposal, you will raise an unanswered question, explain why it is important or interesting, and then propose a series of experiments and/or observational work designed to answer that question. This will require you to research what is known and unknown in a particular field, to develop an answerable question, and then to think carefully about what kinds of evidence you would need to arrive at an answer. This process will also require you to express your ideas in a clear and engaging way. We will work with you to develop an appropriate question, and will give you feedback on a draft of your proposal.

As students, you will also act as reviewers of the work by your peers. This exercise will mimic the way real grants are reviewed and funded. The class will act as a panel of reviewers to evaluate the proposals and decide on funding priorities. For this process we will set aside one discussion session and class period. Each student panelist will participate in the discussion and evaluation of several other proposals. In addition, each student will be responsible for leading the discussion on one proposal. More details will be provided later. You will be evaluated on your contributions to the panel discussion, and your written review of one of the proposals, as well as your own proposal.

**COURSE GRADING (I WILL use the +/- grading option)**

<table>
<thead>
<tr>
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<th>Points</th>
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<tbody>
<tr>
<td>Hour-long exam #1</td>
<td>85</td>
</tr>
<tr>
<td>Hour-long exam #2</td>
<td>85</td>
</tr>
<tr>
<td>Final exam</td>
<td>100</td>
</tr>
<tr>
<td>Essays</td>
<td>60</td>
</tr>
<tr>
<td>Other Problems/Assignments</td>
<td>150</td>
</tr>
<tr>
<td>Proposal (includes review)</td>
<td>120</td>
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</table>

For Graduate credit: 20 additional points will be attributable to your presentation (see me).

⇒ About “D” Grades (Hopefully, I won’t have to give any!): The Board of Regents has instituted a new policy that requires students to receive a C- or better to pass a class. In my opinion, a “D” represents “below average,
but PASSING”. Thus, I disagree with this policy. However, you should know that if you get a D, you will have to take the course over.

Extra Credit (due by the last class in the semester)
You may receive up to 8 points extra credit for two one-page write-ups of ecological seminars (4 points for each write-up). For this optional assignment, attend 1-2 ecology/wildlife biology related seminars (e.g. **Wednesday** afternoons at 4 PM in the UC theater) and write a summary and evaluation of the presentation(s) you attend. Your summary should include:

- The title of the seminar and name of the speaker
- Information on the talk (main questions, why the study is important, how the research was done, major findings)
- Your evaluation of the talk (did you like it? Why or why not?)
- 1-2 questions you would like to (or did!) ask the speaker.

FINALLY, I have **zero tolerance for plagiarism** (i.e. if you plagiarize you will fail the course). Plagiarism includes “recycling” work verbatim from another class. Please see me if you have any questions about what constitutes plagiarism. **SEE ALSO APPENDIX AT THE END OF THIS DOCUMENT.**
APPENDIX: Thoughts on academic dishonesty & plagiarism

Here are a few relevant items from the University of Montana code of academic conduct. Note that violations of any of these can lead to penalties including an “F” in the course and even expulsion from the University.

1. **Plagiarism:** Representing another person's words, ideas, data, or materials as one's own.

2. **Misconduct during an examination or academic exercise:** Copying from another student's paper, consulting unauthorized material, giving information to another student or collaborating with one or more students without authorization, or otherwise failing to abide by the University or instructor's rules governing the examination or academic exercise without the instructor's permission.

6. **Submitting work previously presented in another course:** Knowingly making such submission in violation of stated course requirements.

**NOTE ON #6: I will be very clear about how you can use work previously presented in another course. I consider “recycling” your previous course work to equal plagiarism.**

SOME THOUGHTS ON PLAGIARISM (from the syllabus of Dr. O. Garton, Univ. Idaho, Department of Fish and Wildlife Resources):

“A fundamental goal of education is to produce students who can evaluate ideas – both analysis and synthesis – and who can produce significant original thoughts. Plagiarism is simply repeating words or thoughts of other people, without adding anything new. Therefore, submitting a plagiarized paper – in addition to the wrongful conduct – does not demonstrate the level of understanding and skill that an educated person is reasonably expected to have.” (R. B. Standler. 2000. Plagiarism in colleges in USA. [http://www.rbs2.com/plag.htm](http://www.rbs2.com/plag.htm)).

“Plagiarism means using another’s work without giving credit. You must put others’ words in quotation marks and cite your source(s) and must give citations when using others’ ideas, even if those ideas are paraphrased in your own words.” ([http://sja.ucdavis.edu/sja/avoid.htm](http://sja.ucdavis.edu/sja/avoid.htm))

“Plagiarism is a form of theft. Taking words, phrasing, sentence structure, or any other element of the expression of another person’s ideas, and using them as if they were yours, is like taking from that person a material possession, something he or she worked for and earned.” (J. Cochran, Wake Forest University, [http://www.guilford.edu/original/ASC/TWZ/define.html](http://www.guilford.edu/original/ASC/TWZ/define.html))
“Note that the intent of a plagiarist is irrelevant. It is no defense for the plagiarist to say “I forgot.” Or “It is only a rough draft.” Or “I did not know it was plagiarism.” (R. B. Standler. 2000. Plagiarism in colleges in USA. www.rbs2.com/plag.htm)