

WLE 410 – Wildlife Population Dynamics and Conservation

Fall 2017 Course Description and Syllabus

Instructor:

Dr. Erik Blomberg

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Number of credit hours: 3 **Prerequisites:** WLE 200, SMS 300, or BIO 319

Class Meeting Times: T/Th 9:30-10:45 a.m. Lengyel Hall Room 127.

Office Hours: Thursdays 11 to 12 or by appointment.

Course Overview: How many moose are there in Maine? What life stage limits the recovery of Atlantic salmon? Does hunting reduce the numbers of black ducks in the Atlantic Flyway? Which forest songbird populations are expected to be impacted by climate change? Understanding how animal abundance changes and what causes abundance to change are two subjects that are central to conservation of our fish and wildlife resources. In population ecology, we quantify these changes and explain the mechanisms behind them. This requires evaluating population size and the underlying demographic rates (survival, recruitment, and immigration/emigration) that contribute to population growth or decline, as well as understanding the theoretical underpinnings of population growth. These are the subjects we will cover in this course.

Learning Outcomes:

Course Goal - In this course we will examine the field of population ecology and its application to fish and wildlife conservation; improving students' understanding of these topics constitutes the course goal.

Expected Outcomes - I believe the information covered in this course is vital to professionals in the fields of wildlife ecology, fisheries, and/or conservation biology, and it is my personal objective that what you learn during this course will be directly relevant to your future career in these fields. With that said many of the subjects we will cover are complex, and may require additional work on your part to apply in the future. For example, just because we spend a week discussing capture-mark-recapture methods does not mean you will be an expert on designing such studies. Successful students will, however, be able to 1) relate conceptual ideas in theoretical population ecology to real-world management problems, 2) evaluate questions related to how and why animal abundance changes in space and time, 3) critically assess other's work and provide

constructive suggestions in these areas, 4) speak intelligently about animal population dynamics with people who are not professionals in your discipline.

WLE 411 Lab: WLE 411 is the companion lab to the course. It is not a co-requisite for WLE 410, however it IS required for most students in WFCB. The subjects we cover in lab will parallel and reinforce many materials covered in lecture, however taking the lab is not necessary to do well in WLE 410. If you are not presently enrolled in the 411 lab, but would like to be, please see me.

Text: We will use the **second edition** of “Conservation of Wildlife Populations – Demography, Genetics, and Management” by L. Scott Mills as the core reference material for this course. It is available from the Campus Book Store, online outlets such as Amazon, and is also available (for free) as an e-book from the Library website. I do not follow the book exactly and I regularly draw on other reference materials for the content we cover in lecture. As such I do not “require” that you purchase the book, but reading it (either online or via a purchased copy) will help you to succeed in the course.

I will periodically assign supplemental readings, either from the text or other sources that I will place on the WLE 410 Blackboard site. These assigned readings ARE mandatory and will be required for you to get the most out of the materials we cover in class. I reserve the right to draw exam materials from these assigned readings.

Electronic Resources: We will use Blackboard as the primary online platform for the course. You should be able to access the Blackboard Course page through your mainstreet portal or at www.bb.courses.maine.edu/. I will use Blackboard for posting assigned readings and for making other course materials (assignments, course syllabus, etc) available to you online. You should check to make sure you can access the class Blackboard page.

Course Requirements:

Grading - Grading in this course will be split between exams (~60% - 360 pts total), written summaries of primary literature (~20% - 120 pts total), and team discussion exercises (~20% - 120 pts total). All assignments are due for submission on Blackboard before the beginning of class on the date listed. Late assignments will receive a 10% deduction for each day they are turned in late up to four days, at which point you will not receive credit for that assignment.

The University defines letter grades based on the following qualitative metrics:

- **A**, Superior work
- **B**, Good work
- **C**, Satisfactory but undistinguished work

- **D**, Poor work that does not adequately prepare students for more advanced work in the discipline. While some courses completed with D grades may contribute towards the total credits needed for graduation, others may be unacceptable for certain specific requirements and within the academic major
- **F**, Failure. No credit is earned for a failed course

I will use these general criteria when evaluating your work, including assignments and individual answers to exam questions. In general I view an assignment or exam answer that presents all relevant information as a “B” grade. An “A” grade would improve upon the minimally relevant facts by drawing connections among concepts, demonstrating insightful thoughts about a subject, etc.

Your final grade will be assigned based on the proportional breakdown of points above, and letter grades will be given as follows:

A = 93.33 - 100 %
 A- = 90 – 93.32 %
 B+ = 86.67 - 89.99 %
 B = 83.33 – 86.66 %
 B- = 80 – 83.32 %
 C+ = 76.67 – 79.99%
 C = 73.33 – 76.66 %
 C- = 70 – 73.32 %
 D = 65 -69.99 %
 F = < 65%

Exams - We will have four exams during the semester, including a final exam during the course final exam period. The final exam will be cumulative, whereas the three semester exams will cover subject matter specific to the materials presented prior to the exam. Exams will be a combination of multiple choice, short answer, worked equations/problems, and/or essay questions, at my discretion. If you must miss an exam for a professional reason (for example, a job interview or attending a professional conference) please clear it with me at least 1 week prior to the exam date. Exams missed for health reasons may only be made up with a doctor’s note.

If you have a disability for which you may be requesting an accommodation, please contact Student Accessibility Services, 121 East Annex, 581.2319, as early as possible in the term. Students who have already been approved for accommodations by SAS and have a current accommodation letter should schedule a time to meet with me as soon as possible to discuss accommodations. I also appreciate being reminded, via email, about accommodations ~ 1 week prior to any exams.

When computing your final course grade, I will only use your three best exam scores and will drop your lowest score. For example, if you scored a 74%, 85%, and 96% on Exams 1, 2, and 3 (respectively) your average exam score entering the Final would be ~85%. A final exam score >85% would improve your cumulative exam score, whereas a score <85% would not change your cumulative exam score. Following this logic then, a score of 0.0 on the final exam would also not change your cumulative exam score, and your course grade would be determined by your score on the three semester exams. If you have any questions about this policy, please ask.

Article summaries - The ability to effectively read and comprehend primary scientific literature is important for natural resource professionals. Our field is continually evolving, and new and improved techniques for monitoring, research, and management are constantly being introduced. Peer-reviewed professional journals such as *The Journal of Wildlife Management* are an important mechanism that biologists use to communicate with one another and stay up to date in the field. During the course I will assign readings from the primary literature. For each article I will require you to write a short article summary to guide your thinking and ensure everyone shows up to class with something to say. I will provide a template and additional guidance for these summaries when the first articles are assigned. Summaries should be < 2 pages long and show that you made an honest effort to read and understand the article. You'll turn them in after discussion, and I will read and comment on them before returning them to you. We will go over expectations for these summaries in greater detail before the first one is due.

Group discussions – On the day article summaries are due, we will hold small group discussions during class that center on the subjects covered in the articles. I will provide each team with a worksheet describing a problem or list of questions and a group-based project to go with it. The group will be responsible for completing the project based on their critical evaluations of the information contained in the articles and what we have learned in class to that point. Class time will be used to read through the assignment as a group, to begin discussing your approach for completing the assignment, and to have the opportunity to ask me questions you may have. I expect you will need to meet with your group out of class to complete the actual assignment.

Obviously for these exercises to be successful requires that all members of the group have carefully read the articles and contribute equally to the projects. So, I will incorporate a peer-review system for team discussions/projects where you will be given an opportunity to provide me feedback on your group-member's involvement (or lack thereof). I'll use this information to make adjustments to your individual grades for the group projects if needed. As such, you should think carefully throughout the semester about whether you contributing equitably to the group's work on the projects.

Additional Assignments – If there is need and/or interest, I reserve the right to assign additional exercises to reinforce materials that are covered in lecture and to adjust the course grade breakdown as necessary.

Submission of Assignments

All assignments should be submitted electronically through the “Assignments” page on the course Blackboard site.

Academic Honesty Statement (drafted and required in syllabi by the University):

Academic honesty is very important. It is dishonest to cheat on exams, to copy term papers, to submit papers written by another person, to fake experimental results, or to copy or reword parts of books or articles into your own papers without appropriately citing the source. Students committing or aiding in any of these violations may be given failing grades for an assignment or for an entire course, at the discretion of the instructor. In addition to any academic action taken by an instructor, these violations are also subject to action under the University of Maine Student Conduct Code. The maximum possible sanction under the student conduct code is dismissal from the University. Read more from the Department of Student Affairs at (<http://umaine.edu/studentaffairs/jad/>),

My Take on Professional Integrity: I expect that students in my classes will hold themselves to a high standard as professional biologists. I expect that you will work hard, respect your peers (and yourself), and be honest with me and your classmates. I will not tolerate plagiarism (see <http://www.plagiarism.org/>), cheating, copying, or otherwise presenting work as your own that was in reality produced by others, and I will deal with such actions in accordance with University policies. With that said, our profession is one of collaboration. I encourage you to discuss assignments, study together, and generally help one another to understand the topics we cover in class. Just make 100% sure that anything turned in to me with your name on it represents your own thoughts, ideas, and efforts, and yours alone, unless the assignment is explicitly defined as a group project.

In addition to University policies and my own views, most professional societies provide us with guidance on standards of professional conduct and ethics. For example:

The Wildlife Society:

http://joomla.wildlife.org/index.php?option=com_content&task=view&id=769) The

American Fisheries Society:

http://fisheries.org/cert_standardsofprofessionalconduct

The Society for Conservation Biology:

<http://www.conbio.org/about-scb/who-we-are/code-of-ethics>

I also expect that you will be courteous to your fellow classmates and to me during our class. I openly admit to being addicted to my smartphone, but you won't see me use it in class except as a time-keeping device (it will be on airplane mode). I expect the same of you. Similarly I will be on time for class and will stay until its completion, and I will attend every class period unless I arrange otherwise with you beforehand. I expect you to pay me the same courtesy.

Students with Disabilities Statement: If you have a disability for which you may request an accommodation, please contact Ann Smith, Director of Disabilities Services, 121 East Annex, 581-2319, as early as possible in the semester.

Course Schedule Disclaimer (Disruption Clause): *In the event of an extended disruption of normal classroom activities, such as a zombie apocalypse, the format for this course may be modified to enable its completion within its programmed time frame. In that event, you will be provided an addendum to the syllabus that will supersede this version.*

Course Schedule (Note this schedule subject to change depending on how quickly or not we progress through the materials):

Week 1: August 29, 31 - Course introduction. Introduction to population ecology and its relevance to wildlife management. Definitions of relevant terms, and why we should care about this subject in the first place. Refresher on mathematical concepts and models.

Reading – Mills Ch. 1., Wilson and Bossert Ch. 1 (Blackboard)

Week 2: September 5, 7 - Theoretical underpinnings of population growth and limitation. Classic models of population growth and their derivation. Density dependence, carrying capacity and population regulation.

Reading – Mills Ch. 5.

Week 3: September 12, 14 - Continue population growth and limitation.

Reading - Mills Ch. 7.

Article Assignment - Romesburg 1981

Week 4: Sep 19, 21 - Introduction to population monitoring and assessment. New concepts for data analysis, time series analysis of count data. Considerations of scale and sampling.

Reading – Mills Ch. 2

Week 5: September 26 - Exam #1 – covers materials through September 21st.

September 28 – Discussion – Group Discussion #1 - Romesburg 1981.
ARTICLE CRITIQUES DUE.

Week 6: October 3, 5 – Methods for estimating survival and abundance using Capture-Mark-Recapture.

Reading - Mills Ch. 4

Week 7: October 12 – Methods for estimating abundance and population trends using observations of unmarked animals.

Week 8: October 17, 19 – Interspecific interactions: predator/prey dynamics and competition.

Reading – Mills Ch. 8

Week 9: October 24 - Guest Lecture: TBD

October 26 – Guest Lecture: Dr. Hamish Greig, “Direct and indirect effects of predators on prey populations”

Article Assignment: Anderson 2001, Engeman 2003, and Anderson 2003

Week 10: October 31 – Exam # 2. Covers all topics since last exam

November 2 -- **Group Discussion # 2:** Anderson 2001, Engeman 2003, and Anderson 2003. **ARTICLE CRITIQUES DUE.**

Week 11: November 7, 9 - Projecting stage-structured population growth using matrix projection models. Stable age distribution, reproductive value, perturbation analysis. **INTRODUCE THIRD GROUP ASSIGNMENT**

Reading – Mills Ch. 6

Week 12: November 14, 16 – Stage-structured growth 2, Life History Theory.

Week 13: November 21 — Harvest Management, Additive vs. Compensatory Mortality

Reading – Mills Ch. 14

Week 14: November 28 – Group Discussion #3. ARTICLE CRITIQUES DUE.

November 30: Exam #3. Covers all topics since last exam

Week 15: December 5, 7 – Presentations of Third Group Discussion Assignment.

Final Exam: Tuesday 12 December 9:30 to 11:30 in Lengyel 127. Final is Cumulative.

Semester Assigned Readings (can be downloaded from Blackboard Site):

Journal Articles:

Anderson, D. R. 2001. The need to get the basics right in wildlife field studies. *Wildlife Society Bulletin* 29: 1294-1297.

Anderson, D. R. 2003. Response to Engeman: Index values rarely contribute to reliable information. *Wildlife Society Bulletin* 31:288-291.

Engeman, R. M. 2003. More on the need to get the basics right: population indices. *Wildlife Society Bulletin* 31: 286-287

Romesburg, H. C. 1981. Wildlife Science: Gaining reliable knowledge. *Journal of Wildlife Management* 45: 293-313.

Text chapters available on Blackboard:

Wilson, E. O. and W. H. Bossert. A primer of population biology. 1971. Sinauer Associates. Sunderland, MA, USA. Chapter 1.

Sexual Discrimination Reporting

The University of Maine is committed to making campus a safe place for students. Because of this commitment, if you tell a teacher about an experience of sexual assault, sexual harassment, stalking, relationship abuse (dating violence and domestic violence), sexual misconduct or any form of gender discrimination involving members of the campus, your teacher is required to report this information to the campus Office of Sexual Assault & Violence Prevention or the Office of Equal Opportunity.

If you want to talk in confidence to someone about an experience of sexual discrimination, please contact these resources:

For *confidential resources on campus*: Counseling Center: 207-581-1392 or Cutler Health Center: at 207-581-4000.

For *confidential resources off campus*: Rape Response Services: 1-800-310-0000 or Spruce Run: 1-800-863-9909.

Other resources: The resources listed below can offer support but may have to report the incident to others who can help:

For *support services on campus*: Office of Sexual Assault & Violence Prevention: 207-581-1406, Office of Community Standards: 207-581-1409, University of Maine Police: 207-581-4040 or 911. Or see the OSAVP website for a complete list of services at <http://www.umaine.edu/osavp/>