SYLLABUS
Wildlife Ecology and Management
EAS 518/ENV 463
Winter Semester 2018

Lecture: Tuesdays, Thursdays 12:00PM - 1:00PM (1046 Dana)
Discussion/Lab/Field Trips: Fridays 1:00pm – 4:00pm (2520 Dana, unless otherwise noted).

Primary Instructor: Johannes Foufopoulos
Office: Dana Hall, Rm 2064; Office hours: By appointment (either email or contact after class).
Tel: 763 9460, Email: jfoufop@umich.edu

Course description:
The course focuses on the ecological processes and conservation management tools relevant to the survival of free-ranging mammal, bird, reptile and amphibian populations. Students will utilize a diversity of approaches ranging from field research to computer exercises to address wildlife ecology, management and conservation issues. Topics that will be discussed include wildlife habitat assessment, population abundance and density estimates, nutritional ecology, wildlife disease management, as well as endangered species restoration, both in an US and international context.

Learning Objectives:
It is expected that students are already familiar with the basic evolutionary and ecological principles and have completed at least 2 courses in ecology and evolutionary biology.

Over the course of the semester students will:
- become familiar with the ecology, physiology, population biology management and conservation of vertebrate wildlife species through case studies and appropriate readings.
- be introduced to the complex problems associated with the management of small or declining vertebrate populations.
- become acquainted with the historical and socio-political background of wildlife conservation sufficiently to understand the real-world constraints, traditions, and diverse viewpoints involved in vertebrate biodiversity conservation and management.
- develop analytical problem-solving skills and will gain experience in data interpretation and graphical and mathematical models.
- expand their ability to conduct wildlife research and utilize the primary wildlife literature.

Hence, by the end of the semester… students should be intimate with many current wildlife ecology issues, demonstrate an ability to analyze data, work in groups, apply primary scientific literature to management decisions, be objectively skeptical and able to ask critical questions, have enhanced written and oral communication skills, and gain exposure to wildlife professionals and conservation agencies.

Required Readings:
1. Diversity of scientific publications associated with lectures and discussions (to be downloaded from the Canvas website)
2. Additional background materials are placed on reserve at the Reserve Desk in the Undergraduate Library.

Course Outline

Lectures  (subject to change)

<table>
<thead>
<tr>
<th>Date</th>
<th>Lecture</th>
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<tbody>
<tr>
<td>Thursday Jan. 4</td>
<td>Course Intro; Focus, origins and historical developments of Wildlife Ecology.</td>
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<tr>
<td>Tuesday Jan.  9</td>
<td>Wildlife habitats – Characteristics and management</td>
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<tr>
<td>Thursday Jan. 11</td>
<td>Wildlife habitat selection, use, and measurement</td>
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<td>Tuesday Jan. 16</td>
<td>Population size, and vital rates</td>
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<td>Thursday Jan. 18</td>
<td>Population growth; Lotka-Volterra</td>
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<tr>
<td>Tuesday Jan. 23</td>
<td>Population structure and its significance for management- Leslie Matrices</td>
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<tr>
<td>Thursday Jan. 25</td>
<td>Consumer-Resource relationships: Herbivory</td>
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Tuesday Jan. 30  
Predation and wildlife I

Thursday Febr. 1   
Predation and wildlife II

Tuesday Febr. 6 
Wildlife parasitism and disease – Basic principles
Thursday Febr. 8  
Wildlife infections - Impact on hosts

Tuesday Febr. 13  
Biocontrol Agents, Emerging Wildlife Diseases
Thursday Febr. 15  
Wildlife metabolism and energetics

Tuesday Febr. 20  
Nutrition
Thursday Feb. 22  
Water physiology

Tuesday March 6  
Midterm Exam
Thursday March 8  
Animal movement; Migration: Navigation and physiological adaptations

Tuesday March 13  
Wildlife behavior
Thursday March 15  
Life histories and their implication for conservation

Tuesday March 20  
Guest Lecture
Thursday March 22  
Threats and stressors to wildlife

Tuesday March 27  
Management and recovery of small populations
Thursday March 29  
Invasive species and their management: When and how?

Tuesday April 3  
Global climate change & wildlife: When environment meets physiology
Thursday April 5  
Global Climate Change; Agriculture and wildlife

Tuesday April 10  
Agriculture and wildlife
Thursday April 12  
Urban wildlife ecology and management

Thursday April 17  
Review of course – Take-home exam

Discussions / Labs / Field trips  (subject to change)

Locations will vary according to discussion subject.

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<thead>
<tr>
<th>Date</th>
<th>Topic</th>
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<tbody>
<tr>
<td>Friday Jan. 12</td>
<td>History of Wildlife Ecology; reading &amp; film screening followed by discussion (Dana 2520)</td>
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<tr>
<td>Discussion/Lab 1</td>
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<td>Friday Jan. 19</td>
<td>Birds: Morphology, Ecology and Identification Lab.</td>
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<td>Discussion/Lab 2</td>
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<tr>
<td>Friday Jan. 26</td>
<td>Mammalian Evolutionary Ecology Lab</td>
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<td>Discussion/Lab 3</td>
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<td>Friday Febr. 2</td>
<td>Mammal Identification Lab</td>
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<td>Discussion/Lab 4</td>
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<td>Friday Febr. 9</td>
<td>Field Trip - Arboretum: Introduction to animal detection and identification (meet at the Arboretum’s Reader Center, Washington Heights, across from Mott Children’s Hospital)</td>
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<td>Discussion/Lab 5</td>
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<tr>
<td>Friday Febr. 16</td>
<td>Field Trip – Wetland: Avian Ecology and Behavior (Location TBD; meet in Dana 2520)</td>
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<td>Discussion/Lab 6</td>
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<tr>
<td>Friday Febr. 23</td>
<td>Wildlife disease and parasites – Lab (Dana 2520)</td>
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<td>Discussion/Lab 7</td>
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<td>Friday March 2</td>
<td>No Discussion – SPRING STUDY BREAK</td>
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<td>Friday March 9</td>
<td>Field Trip - Ann Arbor City Parks: Wildlife vegetation evaluation and impacts (meet in Dana 2520).</td>
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<td>Discussion/Lab 8</td>
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<tr>
<td>Friday March 16</td>
<td>Ethics and public perceptions in Wildlife Conservation: Deer management in the US - Class Debate. (Dana 2520)</td>
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<td>Discussion/Lab 9</td>
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<tr>
<td>Friday March 23</td>
<td>Field Trip - Arboretum: Introduction to wildlife censusing.</td>
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Assignment / Evaluation Details

Leading discussion
Small groups of 2-4 students are expected to lead one discussion/lab session. Working with your instructor each group will design a brief (powerpoint, if in lab) presentation providing background to the material covered in a given week. Group members are also expected to lead the discussion of the assigned reading for that week. Performance will be evaluated based on depth of preparation and quality of presentation.

Field Notebook
Every student is required to submit at the end of the semester a field notebook with records/observations of 30 different bird species including explanation/justification of how a species was identified. At a minimum, each record should include a date, location, weather conditions, species ID, justification for the ID (e.g. which morphological criteria were used); optional additional information might include behavioral observations and a line drawing.

Group 15-page paper
- 1 paragraph topic summary Due: January 26 (in Discussion).
- Detailed paper outline by the beginning of Spring Break.
- Final version due: by the end of the semester (last day of regular lecture Th., April 12).
- Length: 15 pages text (not including literature cited, tables, and figures), double-spaced, 1-inch margins, 11-point font.
- In groups of 2-4, students will focus on a specific wildlife issue to discuss in the paper. Both topic and approach are open, as long as the academic/intellectual level is sufficiently rigorous. You should discuss your research ideas with your instructors before the official submission deadline. Students are encouraged to pick a research question that can be answered through collection of one’s own field data. Such data will then be analyzed and presented in the paper (possible examples of such possible topics include: quantification of deer damage to vegetation in Ann Arbor parks, analysis of foraging strategies in chickadees, antipredator defenses in fox squirrels, behavioral analysis of zoo amphibians, etc.). If a field problem is not possible, students may pursue a library project, especially if it involves a quantitative analysis of existing data (e.g. a meta-analysis) and a substantial review of the literature. Possible topic examples include: effects and management of livestock grazing on wildlife, human–predator conflict, invasive diseases and their impact on wildlife, illegal hunting of bushmeat etc.

Some suggestions: Define the problem in detail with special attention to the biologically pertinent dimensions of the situation. Draw on the primary literature to explain the biological and ecological dimensions of the topic. Articulate clearly any hypotheses you might be testing. If appropriate, explore potential management solutions to the problem, that are scientifically sound and socially/economically feasible, drawing on concepts and tools learned throughout the course.
- See 'TERMPAPER Guidelines.doc' in Canvas for further writing guidelines and criteria.
Group Oral Presentation

- 1 paragraph topic summary Due: January 26 (in Discussion). Topic should, but does not have to, be related to the group research paper topic.
- You will give your presentation in the last discussion section of the semester. Come prepared with your presentation on a Jump Drive, Google Docs, or bring a laptop to hook up to the projector!
- Length: 15 minutes plus 5-minute question/answer period. (Strictly enforced!)
- In groups of 3-4 people, select a topic that you wish to present—educate us about something interesting. The only stipulations for the presentation are (1) that your presentation is grounded in wildlife science; and (2) that each member of your group delivers a portion of the presentation. You will be evaluated on the depth of your analysis, and on your organization and delivery of the topic.
- Be careful to avoid a few common mistakes when developing and delivering your presentation:

  * Avoid putting too much information on any one slide. Your listeners should be paying attention to your verbal delivery of the material. To avoid this, use broad headings or bullet points to highlight the topics you wish to discuss.

  * Don’t forget to Practice Your Talk! You have 15 minutes to inform us about your topic, and every person in the group must have a chance to talk. As interesting as your material may be, you will have to be cut off at the 15 minute mark, to ensure that everyone has adequate time to present.

  * Don’t wait until the last minute to ask questions about your presentation. Come to office hours, email me or your GSI, to get any issues worked out early!

Exams

- The midterm exam will be testing your knowledge on all of the course material offered to that point, including lectures and all primary literature readings. You should expect a mixed format including a few multiple choice as well as several essay questions. You are expected to know species names (both common and scientific name) for those cases where the species is mentioned as an example of an important concept. Unless stated otherwise, you are not expected to memorize equations, but you are expected to understand their meaning and the relationship between the different variables, and be able to manipulate them.
- The second exam has a take-home format. It allows you the opportunity to showcase your knowledge, understanding and synthetic ability of the materials covered in the course of the semester. It is challenging, as you will be evaluated on your ability to integrate diverse principles from the ecology, physiology and population biology of vertebrate wildlife and on the clarity, specificity, and succinctness of your writing. Questions will be geared towards conceptual understanding although you should also expect substantial questioning on fact-based details. You will be able to utilize both course-related (lecture materials, course readings) and other, quality sources (primary literature, library books etc.).
- For discussions, you will find that readings focus mostly on articles from the primary literature. While you may find reading these articles challenging, their inclusion serves a dual purpose. First, they familiarize you with the language that scientists use to communicate in, and second, inform you about some of the cutting-edge issues in wildlife biology.

Class Policies

Inclusive Classroom: UM students represent a diversity of individual beliefs, backgrounds, and experiences. An equitable and inclusive classroom is important to me, and I do not wish to exclude anyone from a positive learning environment. I try to use a variety of teaching approaches and examples, and I ask that in all activities every member and instructor of this class show respect for others. If you have a concern about an event, comment, or course content that affects your own or another student’s comfort or learning experience, please speak with an instructor about it.

Assignment Submission. All discussion assignments /lab reports are due at the beginning of the discussion or lecture session listed on assignment overviews (generally one week after work was assigned). One letter grade of your final assignment grade (this includes second exam and final research paper) will be reduced per day your assignment is late, unless you have received prior permission from your instructor to turn it in late.

You are expected to attend lectures and all lab/discussion sections. If you think you cannot make a certain lab, make sure to contact your instructor ahead of time.

Grade Changes. Once a graded assignment has been returned to you, you have one week to appeal for grade changes or re-grading if you feel your assignment has been unfairly or incorrectly judged in some way. You must make your case in writing to your instructor if this is the case. After this one week period, no appeals will be accepted. Be aware that re-grading
involves “starting from scratch” on the grading process and may possibly result in you earning fewer points than the initial grade given.

Extra Time on Exams. If you have been diagnosed with a condition that necessitates the allocation of extra time on exams, then you should make the instructors aware of your situation before the exam takes place. The instructors reserve the right to request official documentation of your condition from the UM Office of Services for Students with Disabilities or another qualified source.

Group Project Grievances. In group projects, the situation occasionally arises where one member of the group puts substantially less effort in the project than other members, thus jeopardizing the entire group’s final performance. When such situations occur, you are encouraged to first try to work the problem out within your group. If the problem persists then you should make it known to your instructor so that appropriate action(s) can be taken. You should deal with this early on, and definitely notify your instructor prior to the assignment due date.

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**Reserve Book List - Partial (available at the Undergrad library: Reserve desk)**


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**Some helpful notes about literature citations:**

First, a reminder – the quality of your paper is very much a function of the quality of the literature you utilize. One purpose of the term paper is to introduce you to the scientific literature, often referred to as “primary” literature. Examples include articles from research journals such as *Journal of Wildlife Diseases, Ecological Applications*, and the *Journal of Wildlife Management*. Textbooks and review articles that are based on primary literature are referred to as ‘secondary”’. Magazine articles such as *Time, The Atlantic Monthly, and Audubon Magazine*, are the ‘popular literature’. *Scientific American*, perhaps *The Smithsonian*, fall somewhere in between popular and secondary literature. Newspaper articles are newspaper articles.

A term paper that makes sophisticated use of primary literature is likely to be much stronger than one that draws most heavily from web sites and the popular literature. **At least 80% (or at least 30) of your citations should be from the primary literature.** Forty would be better. Avoid citations from popular literature. Use web sites as sources only very sparingly, and be sure they are authoritative (e.g., government web sites or very reliable non-governmental organizations like The Fish and Wildlife Service; -- ‘Crazy Bob’s Weather Page’ does not cut it!). Papers that rely heavily on web sources usually turn out to be less substantive, and receive poorer grades.

**Using the Web**

The internet provides enormous access to information. By all means, use it. There are pitfalls, however. How good is the information you get from the internet? The strength of the primary literature is its careful and rigorous review process. A study published in the *Journal of Wildlife Ecology* was submitted to the journal editor, who sent it to at least two other scientists known to be experts in the same field. After a thorough, anonymous review by these peer reviewers, the editor may reject the paper (probably the fate of three quarters of the papers submitted), or accept it after the author makes careful and thorough revisions. Then the paper is published. Now, what about that report you found on the web? No controls, no review, nada. It may look good, but it may still be bogus. The one exception to this rule are government reports (e.g. Fish and Wildlife Service) that you may access on the internet.
Below are some rules on the use of internet resources:

1. **Use the web as much as you like, to get started.** You’ll find interesting stuff. You can use these sites to identify primary sources which you can then access.

2. **You must still use the primary literature.** See the bolded sentences just above.

3. You may include (a few) web citations. Cite them appropriately (see following pages).

4. Web sources vary in quality. I am much more positively inclined to credit information coming from NASA’s home page than say the previously mentioned “Crazy Bob’s Weather Page”. Be careful to rely on quality web sources. It is your job to discriminate among web sources in terms of their quality.

Be aware of the temptations to plagiarize (“to steal [the language, ideas or thoughts] from another, representing them as one’s own original work”). The reason we cite the work of others, in term papers and scientific papers, is to give credit to the work of others, to add authority to our claim (we aren’t just making unfounded claims – our conclusions are based on someone’s careful study), and to be honest about our own contribution and role. Any substantial claim or argument that you make, if it evolved directly out of your reading of the works of others, should be cited. It is OK to use **limited text** from a specific source as long as you cite the source, and put the text in quotation marks (“ ”).

Typically, students encounter problems with citations and plagiarism not because they purposefully make incorrect use of the work of others, but because they are still learning the rules. We hope this will help you learn those rules. Plagiarism will not be tolerated and will result in the loss of credit for the course and the application of all university procedures for dealing with such a transgression.

**Format for Literature Citations**


**A journal or magazine article:**


**A book:**


**Chapter in book:**


**Technical report:**


**Newspaper article:**


**Personal communication:**


**Web Sources (use this reference for guidance if necessary):**