



2019

Wildlife Habitat Management

Paige Warren

University of Massachusetts Amherst, pswarren@eco.umass.edu

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NRC 564 Wildlife Habitat Management

4cr. (Fall 2019)

Instructor: Dr. Paige S. Warren

216 Holdsworth, 545-0061, pswarren@eco.umass.edu

Feel free to use my online appointment book: <https://warrenpaige.youcanbook.me/>

Teaching Assistants:

Aaron Grade, agrade@umass.edu

Abigail Armstrong, armstrong@umass.edu

Meeting time and place:

Lecture (31167) TuTh 1:00PM - 2:15PM Holdsworth 308

Lab 1 (31168) Tu 2:30PM - 5:00PM Holdsworth 105

Lab 2 (31177) Th 2:30PM - 5:00PM Holdsworth 105

Contacting you:

If the instructors need to reach you, your UMass Email account is our primary point of contact. You are expected to check your email (where Moodle announcements are pushed) DAILY for announcements, assignments, and feedback.

Required Texts and other materials:

All students are required to bring an i>clicker to class. For more information on i>clicker's:

<https://www.oit.umass.edu/audience-response-system>

McComb, B.C. 2015. *Wildlife Habitat Management: Concepts and Applications in Forestry*. 2nd edition CRC Press.

PLEASE BE SURE TO GET THE 2ND EDITION!

OPTIONAL: DeGraaf, R.M., M. Yamasaki, W.B. Leak, and A.M. Lester. 2005. *Landowner's guide to Wildlife habitat: forest management for the New England region*. University of Vermont Press.

The Big Picture: becoming a wildlife professional

The primary goal for this course is to help you put into practice tools you have been acquiring in your other Natural Resources Conservation courses. We will explore wildlife-habitat relationships in depth, through the lenses of basic field zoology and natural history, evolutionary biology, and ecological theory. We will introduce you to quantitative tools used to explain ecological processes and their influence on wildlife and their environment. We will examine the dynamics and management of various habitats in New England, North America, and elsewhere through field visits and use of primary literature. But most importantly, we will ask you to take on some of the responsibilities for gathering and synthesizing information about a particular piece of land and its associated wildlife in order to contribute to an ongoing management planning process for the Town of Amherst's conservation lands.

We will place particular emphasis on **managing wildlife habitat in an urbanizing world**. By one estimate, roughly 9% of the land area of the United States is in a zone of wildland-urban interface, but that figure rises above 60% for southern New England. In wildland-urban interfaces, homes intermingle with undeveloped wildland vegetation, and human activities can have profound impacts on animal species. Perhaps equally important, animals have the potential to affect humans, in both positive and

negative ways. Human values, perceptions, and uses of open space become critical aspects of habitat management in wildland-urban interfaces. Amherst and the UMass campus provides us with a useful case study of managing habitat in places where people live and work. The town of Amherst epitomizes the term ‘wildland-urban interface’, with its mixture of houses, farms, and protected areas. Meanwhile, the campus is arguably the most ‘urban’ part of Hampshire County, with a residential population density higher than that of Springfield, MA and 6 of the 10 largest US cities. Yet, species like bobcats, fox, and peregrine falcons regularly occupy campus lands, and species of conservation concern, like wood thrush and wood turtle occur on the town’s conservation lands. Through a partnership with the Town of Amherst, students will be responsible for gathering new information about these conservation lands and contributing to the Town’s ongoing development of land management plans.

Teamwork

We will use a **Team-Based Learning (TBL) approach** in this class. Teamwork is an essential skill to learn in the field of wildlife habitat management. I am regularly asked to comment on former students’ skills at working in a team when I write letters of recommendation. In addition, I have seen that students working in teams perform better on quizzes and other exercises than even the highest performing students do on their own. In order to ensure fairness in grading, we will conduct regular peer evaluations of your team members, and these evaluations will contribute to the calculation of grades on all team-based assignments (see the section below on “Grading”). More information on TBL and the rationale behind this approach can be found at: <http://www.umass.edu/ctfd/teaching/team-based.shtml>

Camera trapping project

As part of a partnership between UMass and the Town of Amherst, you will take part in long-term mammal monitoring across the entire town and campus, using camera traps. Each student will be given responsibility for a camera station in a Town or UMass conservation area. You will check the camera 2 times during the semester, downloading the photos and entering the data into a shared database. As a team you will analyze the data you collected, and then put together and develop some findings that will be incorporated into your final presentation. You will also collect some habitat data at your camera site and write two reports: a habitat assessment of the site (midterm report) and a proposed management plan (final report). Information from this project will be shared with the Town of Amherst’s conservation staff. Thus, your work in this class will make real world contributions.

What to Expect

The purpose of this course is to provide students with “hands-on” experience with habitat monitoring and habitat management planning. All students should come to class motivated to work cooperatively and equally with other students as members of a team; in other words, all students are expected to contribute equally to the work load and engage in the process in a positive and proactive manner. Students should complete this course with an in-depth conceptual and practical understanding of the process and real-world challenges of wildlife habitat management.

By actively participating in the course, you will have the opportunity to:

1. Increase understanding of basic principles of **wildlife-habitat relationships**
2. Increase understanding of the benefits and limitations of current **strategies for habitat management**
3. Gain exposure to commonly used **field techniques** such as GPS navigation, habitat evaluation, and monitoring wildlife using camera traps
4. Identify collect, analyze, and evaluate **primary sources for research** (i.e. journal articles)
5. Synthesize information to **evaluate alternative management strategies**

6. Identify approaches for **breaking down a large, complex project** into manageable stages and steps
7. Gain experience with **collaboration and working in teams** of people with different viewpoints
8. Prepare, present, and defend a **project presentation**

The partnership with the Amherst conservation planners aims to address the following additional goals, with support from the UMass Sustainability Curriculum Initiative:

9. Apply systems-level knowledge to address the **global challenge of urbanization**
10. Evaluate multiple aspects of **sustainability**

Success in this course

- Read this syllabus. If you have any questions regarding this information, it is your responsibility to bring it to Dr. Warren's or the TA's attention by the second week of class.
- Attend all class meetings and labs ON TIME, actively participating in all discussions, and completing all assignments. I recognize that there are unavoidable reasons why you might need to miss class. I expect this to happen no more than 2-3 times per semester. If you have an unavoidable reason to miss class, notify Dr. Warren as well as your team members as soon as possible. I find that team mates are often supportive and understanding, provided you are a good communicator and offer to make up the work you missed. If you miss more than 20% of the classes, you will FAIL the participation grade and be in danger of failing the course.
- Complete your projects. I expect that it will take about 4 hours per week outside of class time to complete your work.
- Do the assigned reading or research BEFORE the appropriate class session
- Ask questions! You may ask anytime you need a clarification. There is no such thing as a bad question. If you think of a question outside of class time, I encourage you to use the Moodle news forum and team forum to post your questions. This allows others to benefit from seeing the question and the answer. Often, your classmates weigh in with good suggestions for solutions to an issue.
- Provide constructive and supportive criticism of each other's work. Peer review is a very important part of the scientific process. It is often hard to hear criticism; so, each person in the course will be expected to both give and receive feedback on his/her work. Each student brings to the class a unique world view that has been shaped by their personal experiences and observations. By sharing this world view, each of us will develop appreciation for the diversity of approaches and motivations of our peers, as well as honing our communication skills.

Grading

This is a 4 credit course with a single final grade. The lecture portion and lab portions contribute roughly equally to your final grade and are designed to provide you with an integrated exposure to wildlife habitat management. There are 100 total points available for the class. To calculate your grade out of 100%, you can simply add together the points from all your assignments.

Individual grades on team assignments will be calculated as:

$$\text{Team total score} \times \text{peer evaluation score} / 100 = \text{Individual assignment score}$$

For example:

Student	Team Score	Peer Evaluation	Individual Score
A	20	100	20
B	20	80	16

Participation (10%) - To obtain the maximum participation score, you should:

- attend class regularly and on time - i.e. no more than 2 unexcused absences
- participate actively in class discussions and team exercises
- complete at least 3 peer reviews of your team members' contributions, providing constructive feedback
- check your camera trap twice and return the materials to the TA (Oct 1, Dec 11)
- spend at least 1 hour processing photo data from the camera in November

Quizzes (10%) – 5 quizzes, one at the start of each unit worth 10pts each; lowest quiz grade is dropped. For each quiz, an online version will be posted to be completed individually before class, and a team-based version will be administered in class. The questions are geared to serve as practice for the midterm and final reports.

Team exercises (10%) – In both the lecture and lab periods, we will carry out roughly one graded exercise per week (10pts). These either reinforce concepts from the lecture or help you to develop portions of your habitat management plan. Most of these exercises will be completed and turned in during the class/lab period. Some outside coordination will be necessary as a team. We will discuss strategies for coordinating outside teamwork in class/lab to ensure that all team members participate.

Midterm/Final Reports (40% - 20pts per report) – In place of traditional exams, you will complete two ‘reports’, using the location of your camera trap station as a case study. The first portion of the report will consist of short answer questions with right/wrong answers. The second portion will be an essay in which you will be asked to apply the concepts and methods we cover in class to your case study. Answering the essay question will require you to find articles from the scientific literature. I will post the essay questions early in the semester so that you will have ample time to work on writing your answers.

Team Habitat Management Plan (25%) - Each team will develop a wildlife management plan addressing a particular issue and set of focal species at a site in Amherst or the surrounding towns (see Moodle, "Resources for Your Plan"). Components of the plan will be developed as part of the lab exercises. You and your team will present the final plan during the final exam time slot.

The relative values for all assignments in the class (lecture + lab) are as follows:

Assignment	Due Date	Type	%
Participation (<i>details above</i>)	-	Individual	10
Quizzes (10pts each, 5 quizzes, drop lowest)	(<i>see Moodle calendar</i>)	Individual/Team	10
Team exercises (10pts each, averaged)	(<i>complete during class time</i>)	Team	10
Site assessment from camera site	TBA	Individual	5
Midterm report (Habitat assessment)	TBA	Individual	20
Final Report (Management plan)	Dec 13	Individual	20
Final presentation of plan (final exam slot)	Dec 18, 10:30am-12:30pm	Team	25
TOTAL POINTS			100

Letter grades will be assigned approximately as follows:

A = 94-100%	C+ = 77-79%
A- = 90-93%	C = 72-76%
B+ = 87-89%	C- = 69-71%
B = 83-86%	D+ = 66-68%
B- = 80-82%	D = 60-65%
	F = <60%

If the average score is less than 75%, the average score will be assigned a letter grade of "C" and other scores will be scaled in proportion to the percentages outlined above and letter grades assigned accordingly. This has yet to happen in any year I have taught this course.

Field trips

During the twelve weeks of lab, **we will be outside doing a field trip on at least 7 of those weeks.** The trips will provide opportunities to see some lovely places in the Pioneer Valley. We will meet some local conservation professionals and see examples of several different kinds of habitat management practices. If for any reason you will have trouble walking during field trips, please let Dr. Warren or the TAs know as soon as possible so that we can make other arrangements. A tentative schedule of trips is posted on Moodle but is subject to change, pending final arrangements. I will share updates via the Moodle news forum, which pushes messages to your UMass email account – so stay tuned!

Remember to **come prepared** for the field trips:

- Wear appropriate clothing and shoes
- Bring water and snacks
- If you have them, you may want to bring your binoculars or field guides
- Bring a notebook or clipboard for taking notes

Fostering a Civil Classroom

In this course, we may discuss some sensitive or controversial issues, such as lethal control of wildlife. We will at times grapple with the social implications of approaches to wildlife habitat management, and we will discuss aspects of natural resource management that touch on socioeconomic, racial and ethnic differences. Students are encouraged to articulate themselves with sensitivity and passion through oral presentation and discussion as well as through written exercises and assignments that are grounded in research and supported by evidence. We value difference in this class and will engage one another with mutual respect and kindness.

Pronoun Policy

Everyone has the right to be addressed by the name and pronouns that they use for themselves. Students can indicate their preferred/chosen first name and pronouns on SPIRE, which appear on class rosters. Please let me know what name and pronouns I should use for you if they are not on the roster. A student's chosen name and pronouns are to be respected at all times in the classroom.

Course Safety

One of the key objectives of the lab portion of this course is get you out in the field, observing and using commonly used tools of the trade. The camera trapping project asks you to go to off-trail locations in local conservation areas on your own time. The ability to work independently in the field is another aspect I am regularly asked to comment upon in letters of recommendation. In the interest of safety, however, we strongly recommend that you do all your fieldwork for this course in pairs.

If you have an emergency, **call 911**, and IMMEDIATELY contact Dr. Warren or the TA.

If you are ever uncomfortable while visiting a field site outside of class, LEAVE IMMEDIATELY and contact Dr. Warren or the TA.

Please note that by enrolling in this course, students agree to indemnify and save harmless the instructors, the Department of Environmental Conservation, and the University of Massachusetts of,

from and against any and all claims, including personal liability or medical claims, demands, suits, actions, other legal proceedings, and damage, which may be brought or asserted against or suffered or sustained by the instructors, the Department of Natural Resources Conservation, and the University of Massachusetts and which may arise out of or may be connected in any way with action done or suffered by the student in connection with this course.

Academic Honesty Policy of the University

Honesty is critical to the mission of science and to your education. Cheating and other forms of academic dishonesty are a violation of the spirit and the regulations of the University. Students who violate the Academic Honesty Policy of the University in this class will be subject to review of that action under the Policy and Appeal Procedure described in the Undergraduate Rights & Responsibilities Guide of the University. If violation of the academic policy is confirmed once the procedures are completed, the student will receive a grade of zero on the assignment for which the violation was carried out.

For more information about what constitutes academic dishonesty, please see the Dean of Students' website: http://www.umass.edu/dean_students/codeofconduct/acadhonesty/

Resources to help your learning

The Writing Center

W.E.B. DuBois Library-Learning Commons

writingcenter@acad.umass.edu • 413.577.1293 • www.umass.edu/writingcenter/

Providing free writing instruction for all UMass students at all stages of the writing process

Disability Services

161 Whitmore Admin. Bldg

ds@educ.umass.edu • 413.545.0892 • <http://www.umass.edu/disability/>

The University of Massachusetts Amherst is committed to providing an equal educational opportunity for all students. If you have a documented physical, psychological, or learning disability on file with Disability Services (DS), Learning Disabilities Support Services (LDSS), or Psychological Disabilities Services (PDS), you may be eligible for reasonable academic accommodations to help you succeed in this course. If you have a documented disability that requires an accommodation, please notify me within the first two weeks of the semester so that we may make appropriate arrangements.

University Computer Help Line

www.oit.umass.edu/support • Help Desk: 413-545-9400

For all your computer and technical questions

Resources for International Students

www.umass.edu/ipo/iss/

The International Students & Scholars Office serves the needs of our international students.

Center for Counseling and Psychological Health

24-Hour Crisis Hotline: (413) 545-0800

<https://www.umass.edu/counseling/>

"Don't let stress prevent success." You can go to them for confidential advice and mental health support. All you have to do is walk-in and ask to be seen.

Course Schedule

Check Moodle regularly for updates to the schedule, reading assignments, and online quizzes.

Unit	Day	Date	Lecture Topic	Lab Activity
UNIT 1 -Basic Principles	1	3-Sep	Introduction to habitat conservation planning	East Leverett Meadow field trip
	2	5-Sep	Habitats, populations, and sustainability	
	3	10-Sep	Conservation in a dynamic world	Amethyst Brook (training on camera traps)
	4	12-Sep	Quiz 1 (Ch 1-3); Habitat selection	
	5	17-Sep	Density and habitat quality	Arcadia Sanctuary field trip
	6	19-Sep	Density as a misleading indicator	
	7	24-Sep	Urbanization; guest: Dr. Robert Ryan	Team project selection + campus low mow site
	8	26-Sep	Sources-sinks vs. metapopulations; <i>REVIEW</i>	
UNIT 2 - Habitat Assessment	9	1-Oct	Climate change & wildlife habitat	Campus waterways trip with Dana McDonald
	10	3-Oct	Quiz 2 (Ch 4-7); Assessment intro	
	11	8-Oct	Identifying critical habitat elements	Forest assessment part I – two town sites
	12	10-Oct	Rapid assessments (Forestry for the Birds)	
	13	15-Oct	NO CLASS (Monday schedule)	NO LABS; check camera traps
	14	17-Oct	Disturbance - hurricanes!	
	15	22-Oct	Structured decision making; <i>REVIEW</i>	Setting goals in habitat management plan
UNIT 3 – Micro-level Management Approaches	16	24-Oct	Non-forest approaches (3 videos)	
	17	29-Oct	Quiz 3 (Ch 9-12)	Conway forest; Forest assessment Part II (<i>Forestry for the Birds demonstration</i>)
	18	31-Oct	Forest structure - even vs uneven aged	
	19	5-Nov	Age structure exercise	Cronin field trip
	20	7-Nov	Riparian buffers / Dead wood; <i>REVIEW</i>	
UNIT 4 – Macro-level Management Approaches	21	12-Nov	Corridors	Management alternatives*
	22	14-Nov	Quiz 4 (Ch 15, 16, 22); Island biogeography	
	23	19-Nov	Fragmentation (exercise)	Camera data analysis*
	24	21-Nov	Adaptive management	
	25	26-Nov	NO CLASS (Holiday)	NO LABS; teams meet with TAs
	26	28-Nov	NO CLASS (Holiday)	
UNIT 4 – Modern Issues	27	3-Dec	Quiz 5; Desired conditions	Draft presentation
	28	5-Dec	Conservation conflicts	
	29	10-Dec	Ethics of rewilding vs. leaving it alone	NO LABS; teams meet with TAs
		18-Dec	Final presentations; 10:30am-12:30pm	