

# WILDLIFE ECOLOGY & CONSERVATION

11:216:464

## Ecology, Evolution, and Natural Resources

**Lecture:** M 10:55am-12:15am; ENR 123

**Lab:** Th 2:15pm-5:15pm (Lab Section 1)  
F 9:15am-12:15pm (Lab Section 2)  
(Labs are held in ENR 237)

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### **Course Introduction**

The conservation of wildlife populations requires a foundational knowledge of wildlife ecology, population dynamics, and demography. Many of the key issues in wildlife ecology are quantitative in nature, and proper conservation planning involves mathematical modeling approaches. In this course, you will gain an understanding of the mechanisms that impact wildlife populations, learn about the patterns that can be seen in fluctuations of wildlife populations due to biotic and abiotic influences, learn how ecologists, wildlife biologists, and others monitor and evaluate wildlife populations over short and long time scales, and consider the various management and conservation practices used to maintain and increase the population size of endangered and threatened wildlife populations.

### **Learning Goals**

1. Understand the deterministic and stochastic factors affecting wildlife at the population level.
2. Apply mathematical population model approaches to address applied wildlife management issues.
3. Think critically and solve problems using evidence-based reasoning.
4. Communicate effectively orally and through written and graphical text.

### **Course Materials**

**Books:** Fryxell, J.M., A.R.E. Sinclair, and G. Caughley. 2014. *Wildlife Ecology, Conservation, and Management*, 3rd edition. Wiley Blackwell Publishing (paperback)

## **Requirements/Grading**

*Exams:* There are 2 exams in this course (midterm & final). Exams are in 3 parts: 1) multiple choice covering important terminology, concepts, and people; 2) short answer questions predominantly covering principles/theories presented in class; and 3) critical thinking essay questions designed to allow students to apply knowledge to practical problems. Material in the course is hierarchical, with ideas and concepts building upon each other throughout the semester. Therefore, each exam/assignment is effectively cumulative.

*Labs:* There will be 10 quantitative labs throughout the course to help you further your understanding of various quantitative methods in wildlife ecology and conservation. Many of the labs **DIRECTLY RELATE TO YOUR TERM PROJECTS**. You will work in assigned pairs to go through the exercises, but you will hand in your homework assignments separately. You are expected to remain in lab for the entire period. If you finish early, you likely have not spent enough time tweaking the models to truly understand how they work. Assignments will be due 1 week later, at the beginning of class. If you do not hand it in by the time class starts, a 5pt penalty will be imposed for each day the assignment is late until you reach 0. Attendance is mandatory, unless there is a documented excuse. If you miss lab without a documented excuse, you will earn a zero for that assignment. If you do miss a lab, it is your responsibility to contact the TA and make arrangements to complete the assignment.

*Project:* You and your partner will be assigned a NJ species that is managed, monitored, or conserved. Your task will be to develop a conservation/management plan for that species, drawing upon research, and readings. More details will be provided in class. You will turn in a report and prepare a 15-20 minute presentation for class.

*Project Tasks:* On some lab days, there will also be an assigned Project Task. These tasks are designed to provide you class time to work on your term projects and to seek help from the course instructors. Details for each task will be provided on the day of lab, and you are expected to work on these throughout the semester. Please do not wait until the last minute to throw your project together.

## **Grading Breakdown**

|          |     |
|----------|-----|
| Mid-Term | 20% |
| Final    | 20% |
| Lab      | 20% |
| Project  | 40% |

*Participation:* You are expected to be in class every day. Absences will be excused pending documentation (i.e. doctor's note, police report, obituary). It is also important to be mentally engaged in class. Paying attention, asking questions, and participating in discussions will improve your learning and allow you to get the most out of the class. Although a point value is not assigned for participation, it will be considered in calculating your final grade. There is NO extra credit.

## **Advising/Office Hours**

There are no designated office hours for this course. We are available to you *by appointment* throughout the semester. Please give us a day's notice, if possible, so we can accommodate you as quickly as possible. Please do not hesitate to ask for help. That's what we are here for, and we want you to do well!

## Academic Integrity

All work handed in must be your own. Cheating on exams or assignments will not be tolerated and will result in a zero for that assignment. Academic integrity infractions are subject to further disciplinary penalties through the University. See <http://academicintegrity.rutgers.edu/academic-integrity-policy/> for the University's current policies.

| Date       | Lecture                        | Lab | Topic   | Room | Reading  |
|------------|--------------------------------|-----|---|------|----------|
| Sep 9      | *                              |     | Biodiversity, Ecosystem Functioning, and the Importance of Management   | 123  | Ch. 1    |
| 12,13      |                                | *   | <i>Lab 1a: What is Biodiversity?</i><br><i>Lab 1b: Why is Biodiversity Important?</i>                             | 237  |          |
|            |                                |     | <b>Wildlife Ecology</b>   |      |          |
| 16         | *                              |     | Habitat Selection, Dispersal  | 123  | Ch. 3, 5 |
| 19, 20     |                                | *   | <i>Lab 2: Analyzing Camera Trap Data</i>  | 237  |          |
| 23         | *                              |     | Conservation Genetics   | 123  | Ch. 20   |
| 26, 27     |                                | *   | <i>Lab 3: Population Genetics</i>   | 237  |          |
| 30         | *                              |     | Behavior/Factors Influencing Extinction Risk  | 123  | Ch. 7    |
| Oct. 3,4   |                                | *   | <i>Lab 4: Genetic Drift</i><br><b>Project Activity 1: Assignment and Preliminary Literature Search of Species</b> | 237  |          |
|            |                                |     | <b>Population Dynamics</b>  |      |          |
| 7          | *                              |     | Population Growth   | 123  | Ch. 4    |
| Oct 10, 11 |                                | *   | <i>Lab 5: Exponential and Logistic Population Models</i>  | 237  |          |
| 14         | *                              |     | Estimating Vital Rates  | 123  | Ch. 14   |
| 17, 18     |                                | *   | <i>Lab 6: Life Tables</i><br><b>Project Activity 2: Guided Research on Vital Rates</b>                            | 237  |          |
| 21         | *                              |     | Population Viability Analysis   | 123  | Ch. 16   |
| 24, 25     | *                              |     | <i>Lab 7: Population Viability Analysis</i>   | 237  |          |
| 28         | Mid-Term Exam                  |     |   |      |          |
| 31, Nov 1  |                                | *   | <b>Project Task 3: PVA of Assigned Species</b>  | 237  |          |
| 4          | *                              |     | Matrix Models   | 123  | Ch. 13   |
| 7, 8       |                                | *   | <i>Lab 8a: Age/Stage Structured Models</i><br><i>Lab 8b: Sensitivity Analysis</i>                                 | 237  |          |
|            |                                |     | <b>Wildlife Management</b>  |      |          |
| 11         | *                              |     | Harvested Populations   | 123  | Ch. 19   |
| 14, 15     |                                | *   | <i>Lab 9: Harvest Models</i><br><b>Project Task 4: Matrix Model and Sensitivity Analysis of Assigned Species</b>  | 237  |          |
| 18         | *                              |     | Managing Landscapes for Wildlife  | 123  | Ch. 18   |
| 21, 22     |                                | *   | <i>Lab 10: Protected Areas</i>  | 237  |          |
| 25         | *                              |     | Human Dimensions of Wildlife Management   | 123  |          |
| 28, 29     | Thanksgiving Holiday (no labs) |     |   |      |          |
| Dec 2      | *                              |     | Management of Nuisance Wildlife   | 123  | Ch. 20   |
| 5,6        |                                |     | Presentations<br><b>Term Projects Due</b>   | 237  |          |
| 9          | *                              |     | Presentations continued (if needed)   | 123  |          |
| TBD        |                                |     | Final Exam  | 123  |          |