

Birds and the Environment

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Office hours: 11:30-12:30 MW or by appointment

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Lectures: (Mon, Wed 10:30, SLH C) **Labs:** (Mon, Tues, Wed 2:30) LUM 131

Learning Objectives:

- (1) Be able to understand and describe, using case studies and evidence, current and historical causes of bird population declines
- (2) Be able to understand and describe the methods and experimental design used by scientists to study bird population declines
- (3) Learn through first-hand experience how population trend data are collected in North America and learn how to use these data bases to test predictions for causes of population declines
- (4) Be able to understand and describe, using case studies and evidence, the diverse and often specialized adaptations of birds
- (5) Be able to understand and describe the methods and experimental design used by scientists to study form and function in birds
- (6) Apply your knowledge by explaining and critiquing a recently published scientific paper using effective and interesting scientific writing

Grade Distribution:

25% midterm exam (22 October; covers all lecture material to 15 Oct; short answer format)
45% final exam (December Exam Period; short & long answer format covers whole course)
30% lab assignments (10% Trend Analysis Poster, 10% Form & Function Assignment, 10% Quizzes)

Textbook:

Silence of the Songbirds (2007, Harper Collins) by me... Bridget Stutchbury. My book explains in a non-technical manner the various causes of songbird declines, and includes descriptions of my own research, other studies on bird declines, and scientific references. This book is required reading for the course and will complement the lectures and labs the first half of the course.

We will not use a traditional, thick, and expensive Ornithology textbook. There are sufficient on-line resources and in-class resources for all aspects of this course.

For case studies used in lecture, you will be provided with the scientific reference so you can look up the article yourself if you need to (e.g. for clarification, or for use in other courses). Unless told otherwise, you are not required to read the original articles upon which the case studies are based.

Other Resources:

Cornell Lab of Ornithology “All About Birds” web site
<http://www.allaboutbirds.org/Page.aspx?pid=1189>

Lectures:

Lectures during the first half of the course will focus on avian biodiversity and global patterns and causes of bird declines. The second half of the course will focus on avian adaptations in morphology, physiology and behaviour.

Labs: (No late assignments accepted without medical note)

The goals of the labs are to:

- (1) Conduct ornithological field research to learn how bird identification and surveys are done and to learn how to write-up and present the results of bird surveys using similar tools as professional scientists.
- (2) Learn bird taxonomy and anatomy to better understand biodiversity and avian adaptations to the environment

Several labs will require field trips to locations on campus, weather permitting. Dress with appropriate jackets, jeans, boots etc. If wet weather prohibits a field trip then an indoor lab exercise will be done instead.

Bird Decline Poster (10%): We will learn about 3 amazing long-term data bases that ornithologists have collected over the past 20+ years that generate scientifically-based estimated of population trends for dozens of species of North American birds. For this assignment, you will work in groups of 1-3 students to test a hypothesis for bird declines by using the on-line data to test predictions. Poster due Oct 15-18; the poster must be submitted electronically via Moodle prior to lab, and bring a hardcopy to lab to the lab for the poster conference session.

Form & Function Assignment (10%): The labs in the second half of the course focus on form & function, in other words, how bird’s bodies work and why. The “why” is answered at the evolutionary scale, i.e. how natural selection shapes anatomy, physiology, and behaviour. We will examine feather structure, adaptations for flight, basic anatomy, and song production. For this assignment (5 pages, double spaced), you will summarize the methods, results and conclusions of a scientific article (published in 2011; no exceptions) that presents original data/results/experiments exploring the adaptive significance of some aspect of bird anatomy, physiology, or song structure. Due Nov 26-29; the paper must be submitted electronically via Moodle prior to the lab on that day. Students may work in groups of up to 3 on this assignment.

Quizzes (total of 10%): For half the labs, there will be a short quiz the following week to test your knowledge of key concepts and facts covered during the lab (including required reading). Each quiz will be worth 5 points and there are 5 quizzes. If you are late for lab, or miss the lab, you will get 0 points unless you have a proper medical note.

Plagiarism: We have a **zero tolerance policy** for plagiarism, so you should not copy & paste material into lab assignments. Co-authors on an assignment must assume equal responsibility for the content. Students who submit assignments that contain sentences or paragraphs that are plagiarized will automatically receive a grade of zero for that assignment and the incident will be referred to the Dean's Office for further investigation.