

WESLEYAN UNIVERSITY GRADUATE LIBERAL STUDIES

Summer 2016

SCIE 613

**Biology of Birds**

Geoffrey Hammerson

Why study birds? Part of the appeal of birds lies in their color and beauty, interesting behavior, and impressive flight abilities. Bird study can provide an excellent education in many broadly applicable ecological principles. An interest in birds yields almost unlimited opportunities for discovery wherever one might be. For many non-biologists, watching birds is an important way to renew one's connection with the natural world.

This course goes into avian biology with considerable depth, but discussions are geared toward students with little or no training in biology. The major topics to be covered include evolution, biogeography, ecology, behavior, flight, migration, sensory abilities, basic anatomy and physiology, reproduction, research techniques, and conservation. Some of the specific questions to be investigated include: What does the fossil record tell us about the evolutionary origin of birds? Are birds really feathered dinosaurs? What do geographic patterns of avian diversity tell us about the history and future of birds? What changes in basic quadruped form and function have occurred in conjunction with the evolution of flight? How do birds cope with the environmental extremes of deserts and polar environments? What roles do vision, hearing, olfaction, and geomagnetic sensitivity play in the different aspects of a bird's life? How and why do birds sing? How flexible is bird behavior? What are the relationships among feeding ecology, reproductive behavior, and migration? Certain bird species appear to be declining in abundance, even in intact habitats. Why? What is the evidence? How do biological characteristics of birds help or hinder conservation efforts?

Our activities include morning field trips and afternoon classroom lectures and discussion. Course requirements include five detailed field trip reports and an individual project. Field trip expenses will be shared by students.

**Geoffrey Hammerson** (B.S. University of California, Berkeley; Ph.D. University of Colorado, Boulder) is a research zoologist at NatureServe and is author of more than 70 reports and publications, most recently, *Conservation and management of North American leafcutter bees* (2016, with B. Young et al., NatureServe, Arlington, VA), *The conservation status of the world's reptiles* (Biological Conservation, 2013, with M. Böhm et al.) and *Rapid assessment of plant and animal vulnerability to climate change* (in *Wildlife Conservation in a Changing Climate* (University of Chicago Press, 2012, with Young et al.).

***“Step outside into a Connecticut forest, field, or residential area, or stroll along a stream or wetland. Be alert for movement, tune out traffic noises and dial in to the sounds of nature. Before long, a bird will surely catch your eye or ear. Behind the feathery flights and cooing and cawing, a life of intricate relationships waits to be discovered. Tales of tremendous travels beg to be told. Procreative lives of promiscuity and life-long devotion unfold in parallel. In this course, we will immerse ourselves in the avian lifestyle and find out what it means to be a bird.”***

## ***SYLLABUS***

### ***Texts***

Elphrick, C., J. B. Dunning, Jr., and D. A. Sibley, editors. 2009. *The Sibley guide to bird life & behavior*. Alfred A. Knopf, New York. Note: there is only one edition of this book, though the date and cover may vary.

Dunn, J. L., and J. Alderfer. 2011. *National Geographic field guide to the birds of North America*. Sixth edition. National Geographic.

### ***Readings***

Please read pages 8-120 in Elphrick et al. (2009) before the first class. Following each field trip, please read in the text the sections that cover the bird groups (taxonomic families) we observed in the field (for example, "Sandpipers, Phalaropes, and Allies, Family Scolopacidae").

### ***Important Information for the First Class Meeting***

Please meet in the Vine Street parking lot (V lot, just south of the tennis courts). An early start helps us see and hear more birds, many of which are less active as the day becomes warmer. Wear clothes and footwear suitable for a field trip; bring binoculars (absolutely essential), notebook, pen/pencil; hat; sun screen; field guide; camera (optional). Full-size, 7x35 or 8x42 binoculars are best for our purposes, but compact (e.g., 8x25) binoculars also are acceptable. After the field trip we will return to campus and convene in the classroom for lecture and discussions. Field trip destinations are in part weather dependent and will be provided on the day prior to each trip.

### ***Course Schedule***

#### **Monday August 1**

Morning field trip. Lecture/discussion topics: course overview; bird diversity; evolution; external features.

#### **Tuesday August 2**

Morning field trip. Lecture/discussion topics: feathers, flight, and molt; basic anatomy and physiology.

#### **Wednesday August 3**

Morning field trip. Lecture/discussion topics: sensory systems and communication; migration.

#### **Thursday August 4**

Morning field trip. Lecture/discussion topics: breeding biology.

#### **Friday August 5**

Morning field trip. Lecture/discussion topics: ecological relationships; conservation biology of birds.



## ***Requirements***

- 1. Field trip reports (5).** See report guidelines below. Reports are due two weeks after the field trip. Each report constitutes 15% of the course grade.
- 2. Written report of individual field study (1).** Select one or more study areas (e.g., field site, backyard bird feeder) where you will observe birds for at least eight 45-minute sessions in June and/or July. You may focus on one bird, one species, or multiple species. Try to observe a particular bird for as long as you can. For each session, your written report must include the following information: location, date, and time of your observations; bird species observed; and detailed ecological and behavioral observations, such as: What species did you observe? How did the bird spend its time or obtain food? How did it interact with other birds? What kinds of habitats or microhabitats did it use, and how did it use them? What sounds (songs, calls) did the bird make, and what was the context? How did it respond to people? You won't be able to address all of these questions for every bird, but this should give you some ideas on what to look for during your field session. Try to record extensive observations of a small number of individual birds rather than produce a long list of birds with few detailed notes. If possible, include photographs or sketches to illustrate what you observed, though this is not mandatory. 25% of course grade. Due August 19.

### ***FIELD TRIP REPORT GUIDELINES***

The best way to increase both your understanding of the natural world and your powers of observation is to carefully record your field observations in written and graphic form. Your notes will be of value to you in overcoming an imperfect memory and in providing a record of biological information that often is not available in reference books. Your field notes, if carefully prepared, may be of scientific or conservation value.

Ideally all notes should be written directly into your permanent field notebook while you are in the field. However this often is not practical. I suggest that you record in a small notebook as many observations as possible while you are in the field; strive to be neat, complete (biologically relevant details are important), and organized. At the conclusion of the field trip use these notes (and other mental impressions gained during the trip) to write a final permanent record of your field observations. For best results, do not delay in writing your field notes. Quantify whenever possible.

Please structure your notes according to the following sequence. Do not use a simple chronological format ("first we saw this, then we walked around the bend and saw that"). Prepare a separate account for each site visited.

1. Your name
2. Site name, underlined, bold face, or italics (e.g., Higganum Creek, Town of Haddam, Connecticut)

3. Date and hours at the site (e.g., 1 August 2016, 0730-1230 EDT)
4. Recent weather conditions (sun, clouds, precipitation, temperature, wind). Record tide conditions, if appropriate.
5. Brief description of habitat (topography, elevation, vegetation, soil conditions, water, etc., as appropriate).
6. List of bird species detected and approximate numbers of each species. Notes on behavior, microhabitat, ecology, etc., should be entered after the name of the species; this is the critical part of the field write-up. Basically you should record the bird's habitat and microhabitat (e.g., perched 10 feet above the ground on the trunk of a large white oak in a forest) and behavior (e.g., the bird pecked at the trunk several times, dislodging pieces of bark; appeared to eat small items thus exposed). Lists should be organized according to major taxonomic groups (e.g., use the sequence found in your field guide).

**Important Note:** Your field trip report should be primarily or exclusively an account of your own field observations. However, you may include information obtained from the instructor or from other sources as long as you state the source of that information. Be sure to distinguish clearly between what you actually observed and other general information. For example, record that you saw a least tern plunge into the water and catch a small fish rather than that least terns eat small fishes. Be sure to describe any particular behaviors you observed rather than simply your interpretation of them. For example, record that a piping plover flew away when you approached on foot within 50 feet rather than that piping plovers seem to be wary. Recording these details will help you improve your observational skills and knowledge of bird ecology and behavior.