Syllabus - Biology 3628.03 – Marine Ornithology

June 2015 - Dalhousie University

Instructors: Dr. Rob Ronconi (rronconi@dal.ca) and Dr. Sarah Wong (snpwong@dal.ca)
Phone: 902-266-9864 (cell – Rob) **Office:** TBD
Demonstrator: TBD
Classrooms: LSC 4012 **Field trip:** leaves from parking area outside the Biology Department, between the LSC and Kings.

Purpose and scope

This class will give students an overview of marine ornithology, a sub-discipline of avian biology focused on birds that live in marine environments. The course combines lectures, lab exercises, student-led presentations, and an extensive field trip to seabird breeding colonies in the Maritimes. Students will learn the identification and natural history of seabirds breeding in Nova Scotia, as well as key aspects of the ecology, evolution and adaptations of birds living in marine ecosystems. Lab and field trips will focus on tools and techniques for field study of seabird behaviour, diet, population assessment, and distributions. Independent and group projects will provide experience in conducting field studies, including study design, data collection, data analysis and presentation of results.

Dates (see class schedule for details):* tentative schedule subject to change

Thursday, May 26: Classroom (9-5)
Friday, May 27: Classroom and Lab (9-5)
Saturday, May 28: Classroom and Lab (9-2:30)
Sunday, May 29: Classroom (9-4)
Monday, May 30: Lab (9-11), Lecture Exam (2-4pm)
Tuesday, May 31: Day off / work day
Wednesday, June 01 – Tuesday, June 07: Field Trip
Wednesday, June 08: Work day (group projects)
Thursday, June 09: Presentations (2-5pm) and field notebook due
Friday, June 10: Day off / work day
Saturday, June 11: Final reports due

Prerequisites

Intro. Biology (BIOL 1010 or 1021 plus BIOL 1011 or 1022, or SCIE 15XX), Diversity of Life I (BIOL 2003 or similar intro. to the diversity of animals), and Intro. Ecology (BIOL 2060), or instructor's permission. Knowledge of statistics, Geographic Information Systems (GIS), and familiarity with Excel spreadsheets are helpful, but not required, for research projects.

Auxiliary fees

The fee you paid in addition to tuition is used to cover the cost of van and ferry transportation, vessel charters, supplies, food and lodging during the field course. We will cook meals together using food purchased with these fees. Food allergies and diet restrictions will be accommodated.

Texts and reading materials

There is no textbook for the course, but there are many books and journals available at the Killam library for course projects. PDFs of lectures will be posted online. Students are encouraged to bring their own bird identification guide **or guides are available to borrow during the course**. Suggestions include:

- *A Field Guide to North Atlantic Wildlife: Marine Mammals, Seabirds, Fish, and Other Sea Life* by Proctor and Lynch ($15 on amazon.ca)
- *The Sibley Guide to Birds, 2nd Ed.* by David Allen Sibley ($25 on amazon.ca)
- Any other bird identification guides. Some may be available in the Dalhousie Library.

Binoculars

Binoculars are required for the field trip. Each student should have their own pair. **Some binoculars are available through Dalhousie**, but students are encouraged to bring their own, if possible.

Field Trips

Field trips will all occur within the Grand Manan Archipelago, in the Bay of Fundy, over 7 days. Be prepared for all conditions (cold/hot, wet/dry). One full-day is on a vessel which can be very cold at this time of year. We will depart for Grand Manan on Wednesday, June 01 and return to Halifax on Tuesday, June 07. Travel to and from Grand Manan will take most of the day. During the entire field trip, we will be camping in tents (or other accommodations if available). While on Grand Manan Island, we will be camping at the Anchorage Provincial Park. Facilities here include: toilets, showers and cooking shelters. You will need a warm sleeping bag and will be sharing tents. From Grand Manan, we will take a 3-day field trip to Kent Island, departing Thursday, June 02 and returning to Anchorage Provincial Park on the morning of Saturday, June 04. Dinners will be shared with students from Bowdoin College on Kent Island, but we will cook our own breakfast and prepare lunches. Our last 2.5 days on Grand Manan will be spent as follows: 1) local field trips out to coastal and beach areas of Grand Manan, 2) a field trip out to Machias Seal Island for the day and 3) full day at-sea on board a vessel charter.

Expectations of Students: Students are expected to attend and participate in ALL classes, labs, field trips, and complete all assignments. During the field trip, students are expected to be prepared and assist with camping activities including tent setup, cooking, and dishes. A detailed handout on the field trip will provide further guidance on recommended clothing and

expectations. During all visits to seabird colonies students MUST follow instructions by the instructors, TAs, and colony managers. Instructions and rules when visiting bird colonies are necessary to minimize disturbance to birds.

Evaluation of student performance: A total of 11 assessments will evaluate your performance:

Assignment, Exam, or Presentation	**Marks**	**Due dates (tentative)**
Species profiles (individual)	7	Friday May 27, 8:30
Lab I exercise – Necropsy (individual)	5	Friday, May 27, end of lab
Lab II exercise – Distance sampling (individual)	4	Sat, May 28, end of lab
One page protocol summary and research questions (group)	5	Sun, May 29, 18:00
Lab III: Pellet analysis (group)	4	Mon, May 30, end of lab
Lecture exam (individual)	20	Mon, May 30, 14:00-16:00
Field quiz – seabird identification (individual)	5	During field trip.
Oral presentation of group project (group)	15	Thur, June 09, 14:00-17:00
Field notebook (individual)	15	Thur, June 09, 17:00
Final report for group project (group)	20	Sat, June 11, 17:00
Total	100	

Grading scale: Conversion of numerical grades to final letter grades will follow the Dalhousie University Common Grade Scale:

90-100	A+	77-79	B+	65-69	C+	50-54	D
85-89	A	73-76	B	60-64	C	<50	F
80-84	A-	70-72	B-	55-59	C-		

Brief Description of Assignments

1) **Species Profiles (7%) –** On the first day, each student will be asked to choose a species of marine bird (gulls, terns, petrels, sea ducks, phalaropes and shorebirds) which breeds, migrates or overwinters in Nova Scotia. Students will have 1 day to prepare an 8 to 10 minute PowerPoint presentation about this species to the class. Presentation topics must include: species identification, natural history (breeding biology, foraging behavior, etc.), habitat types, and unique adaptations/physiology for living in marine environments. Students will also find one peer-reviewed scientific paper about an aspect of this species ecology and/or conservation. Research paper must include some aspect of a field study, not lab or mathematical model/simulation. A brief synopsis of the study will be presented as part of the PowerPoint presentation and include: research question/hypothesis, study methods/techniques, main findings, and relevance to conservation/ecology.

2) **Lab exercises (total 13%) –** There will be 4 labs and each will include a brief exercise to be handed in at the end of the lab. Labs will be conducted as group activities but each individual will be responsible for handing in their own exercise (except for Lab IV, which is all group-based).

    a. **Necropsy (5%) –** Necropsy of seabird carcasses will be led by a veterinarian. Students will observe, assist when requested, and should ask lots of questions. Focus of the necropsy session is to learn about avian anatomy with emphasis on physiological adaptations for living in marine environments.

    b. **Distance sampling (4%) –** Distance sampling is a common field technique used during transect surveys to quantify bird (or other animal) densities. Students will be given a dataset of at-sea bird surveys and instructions on using program "Distance". Students will use the program to calculate bird densities and compare density estimates to other estimation techniques.

    c. **Pellets (4%) –** Analysis of regurgitated pellets from gulls or other seabirds is a simple technique for estimating bird diets. Students will be provided with pellets collected from a gull colony. In groups of two or 3, pellets will be filtered through mesh sieves and students will learn to classify "food types" to assess diet. Data will be pooled among groups and used to complete the lab exercise.

3) **Lecture exam (20%)**: The exam will cover material presented in the lectures (including the guest lecture), as well as material presented by fellow classmates in their Species Profiles presentations. The exam will be composed of short and long answer questions.

4) **Field quiz (5%):** During one of the field trip days, students will be given a brief quiz testing marine bird identification. Bird identification will learned through Assignment #1, use of bird identification guides in the field, and records kept in field notebooks.

5) **Group Project (total = 40%):** Students will choose from 5 different projects which range in topics from distribution, abundance, diet and behaviour. The main goal of the project is to collect useful data which can be added to existing databases and used for future monitoring. Essentially, students will contribute to a larger understanding of the ecology and behaviour of seabirds in the Grand Manan Archipelago. To ensure data is being collected using a standardized method, each group will be given documents/peer-reviewed literature that explain the protocols for the respective project in detail. However, each group will come up with their own research questions and will be responsible for leading data collection (all students will contribute to data collection of each project, therefore giving them the opportunity to learn all sampling skills), data analysis, presentation of results and the final report.

The Group Project contains the following three parts:

    a. **One page protocol summary and research questions (5%):** A summary of the

protocol with a datasheet is to be prepared for the class to ensure everyone is collecting the data using the standardized method. Each group will be responsible for ensuring everyone understands the protocol and is collecting the data correctly. Research questions must also be clearly outlined and hypotheses made.

b. **Presentation (15%):** Students will present and discuss their project to the class in a 20 minute presentation, summarizing their research questions, methods, analysis and results and interpretations.

c. **Final report (20%):** Prepare a report in the form of a peer-reviewed manuscript. Follow guidelines for publication in the journal "Marine Ornithology" http://www.marineornithology.org/submission.html . The final report must include: title, author list, abstract, introduction, methods, results, discussion, acknowledgements, and references. Final report should include at least 10 citations from peer-reviewed literature.

6) **Field Notebook (15%) –** Each student will be given a field notebook to be used throughout the class, fieldtrips and data analysis. Field notebooks are a crucial part of all field research programs. These books are used to record data in the field and other observations that may become pertinent to the study. Field notebooks will be handed in at the end of the class for grading. Field notebooks will contain two parts:

   a. Back of Book – For each new species encountered, student should create a brief species profile which will serve as reference to learn species identification skills. Profile should include: description of species highlighting key identification features/marks, simple sketch, and notes about behaviour and habitat.

   b. Front of Book – For each field trip day, students will create a new entry in their book. Each day students should record: date, weather conditions (updated as weather changes), time chronology of days activities, and list of all species seen on that day (including all non-bird species, i.e. marine mammals, fish). These sections should also be used to record data during group field projects in addition to any datasheets being used.

Field Project Descriptions

Student groups will be divided into teams of 3-4 students. Each team will conduct a field project on one of the following topics (below). The team will be considered the "principle investigators" of their own projects; responsibilities include coordinating data collection, ensuring data quality, conducting data processing/analysis, and final presentation (oral and written report). Therefore, ALL students will participate in data collection of each other's projects.

1. **Marine distribution of seabirds –** At-sea surveys of birds will be conducted during all vessel transits including: ferry crossings and vessel charters. These data provide information on the distribution and abundance of birds at sea.

2. **Gull and eider colony abundance –** On the expedition to Kent Island, the class will do a survey of nesting gulls and eiders to create a population estimate for the island. Surveys will also record information on nest contents (e.g., clutch size). Time permitting, surveys will also be conducted on neighboring islands.

3. **Gull Diet –** Pellets regurgitated by gulls will be collected on Kent Island and neighboring islands as well as some coastal areas around Grand Manan. These will be used to quantify diets following methods learned in the lab.

4. **Coastal waterbird surveys –** From different shorelines on Grand Manan and surrounding islands, standardized counts of all species (e.g. seabirds, waterfowl, shorebirds) within different distance intervals up to 500m will be made. These data provide information on the distribution and abundance of waterbirds in different coastal habitats.

5. **Calling rates of storm-petrels –** Three song meters will be set up in storm-petrel colonies (on Kent and Hay) to record vocalizations of petrels during the Kent Island field trip. These can be used to record call rates at different time intervals throughout the day.

Academic Integrity

At Dalhousie University, we respect the values of academic integrity: honesty, trust, fairness, responsibility and respect. As a student, adherence to the values of academic integrity and related policies is a requirement of being part of the academic community at Dalhousie University.

What does academic integrity mean? Academic integrity means being honest in the fulfilment of your academic responsibilities thus establishing mutual trust. Fairness is essential to the interactions of the academic community and is achieved through respect for the opinions and ideas of others. "Violations of intellectual honesty are offensive to the entire academic community, not just to the individual faculty member and students in whose class an offence occurs." [University Calendar]

How can you achieve academic integrity?

- make sure you understand Dalhousie's policies on academic integrity
- give appropriate credit to the sources used in your assignment such as written or oral work, computer codes/programs, artistic or architectural works, scientific projects, performances, web page designs, graphical representations, diagrams, videos, and images
    - Use RefWorks to keep track of your research and edit and format bibliographies in the citation style required by the instructor http://www.library.dal.ca/How/RefWorks
- do not download the work of another from the Internet and submit it as your own
- do not submit work that has been completed through collaboration or previously submitted for another assignment without permission from your instructor
- do not write an examination or test for someone else
- do not falsify data or lab results

[these examples should be considered only as a guide and not an exhaustive list]

What will happen if an allegation of an academic offence is made against you?
Your instructors are required to report a suspected offence. The full process is outlined in the Discipline flow chart and includes the following:

- Each Faculty has an Academic Integrity Officer (AIO) who receives allegations from instructors
- The AIO decides whether to proceed with the allegation; you will be notified of the process
- If the case proceeds, you will receive an INC (incomplete) grade until the matter is resolved
- If you are found guilty of an academic offence, a penalty will be assigned ranging from a warning to a suspension or expulsion from the University and can include a notation on your transcript, failure of the assignment or failure of the course. All penalties are academic in nature.

Where can you turn for help? If you are ever unsure about ANYTHING, contact your instructor.

- Academic Integrity website - Links to policies, definitions, online tutorials, tips on citing and paraphrasing
- Writing Center - Assistance with proofreading, writing styles, citations
- Workshops, online tutorials, citation guides, Assignment Calculator, RefWorks
- Dalhousie Student Advocacy Service - Assists students with academic appeals and student discipline procedures.
    - ➢ Senate Office - List of AIOs, discipline flow chart, Senate Discipline Committee

Date	Day	Time	Activity planned (includes ~1-hr lunch break)
May	Thu	9:00-9:45	Intro to course
26		10:00-12:00	Lectures - Introduction to Seabirds: evolution and biodiversity
		13:00-17:00	Introduce and begin work on Assignment 1 - Species profiles of NS
27	Fri	08:30-10:30	**Assignment 1 [student presentations]**
		11:00-12:00	Introduce Group Project Assignment (2 per group)
		13:00 - 16:00	Lab - Necropsy
28	Sat	9:00-10:00	Lecture - Seabird form and function (adaptations for marine life)
		10:30-11:00	Guest Lecture -
		12:30-13:00	Animal Care exam (for those that don't have the certificate)
		>15:00	rest of day free to work on proposals
29	Sun	9:00-9:50	Lectures - Field techniques for seabirds (census, monitoring, and diet)
		10:00-10:50	Lectures - Breeding and foraging ecology
		11:00-11:50	Lecture - Seabird Conservation and Management
		13:00-15:00	Lab - Distance Sampling
		>15:00	finish proposals.
		18:00	**Research questions, 1-page protocol, and datasheet due.**
30	Mon	8:30-11:00	Lab - Pellet analysis
		14:00 - 16:00	**Lecture exam. Feedback on protocols/datasheet returned at end of exam.**
		>17:00	Get ready for field trip. **Modify protocols/datasheets if needed.**
31	Tue	day off	Get ready for field trip. **Modify protocols/datasheets if needed.**
01	Wed	7:00 ->	Meet at Dal: **distribute each group's one page project protocol to go over during travel to Grand Manan**. NOTE: bring lunch; drive to Black's Harbour, NB. Ferry to Grand Manan (survey for seabirds). Set up camp and evening bird walk.
02	Thu	7:00 ->	Trip to Kent Island. Gull/eider colony census, gull pellet collection, egg measurements, coastal bird survey, evening storm-petrel walk. Camp on Kent.
03	Fri	7:00 ->	Kent Island day 2. Continue work from previous day. Lecture from Bowdoin Scientific Station. Assist Bowdoin projects. Camping on Kent.
04	Sat	7:00 ->	Return to Grand Manan. Set up Camp. Afternoon visits different coastal habitats for shorebirds, sea ducks, and seabirds. Coastal and beach bird survey techniques.
05	Sun	7:00 ->	Full day at-sea vessel charter to different offshore habitats (could include: Machias Seal Island, Murre Ledges, Grand Manan Basin) At-sea seabird surveys. Coastal and offshore survey techniques. Dates subject to change with weather.
06	Mon	7:00 ->	Surveys of different coastal habitats for shorebirds, sea ducks, and seabirds. Dates subject to change with weather.
07	Tue	7:00-17:00	Departure on 9:30 ferry. Seabird surveys from ferry. Return to Halifax.
08	Wed	[work day]	Group projects. Analyze data, prepare presentations, prepare final reports.
09	Thu	14:00-17:00	**Presentations. Groups present and discuss projects. Field notebooks due.**
10	Fri	day off	Students can work on final reports if needed.
11	Sat	17:00	**Final reports due.**

Required field gear for the field trip

We will not have much room in the vehicles so PLEASE DO NOT OVER PACK. However, you should ensure that you have sufficiently warm clothing and bedding. Remember, we are gone for 7 days and there will be no opportunity to wash your clothing, so plan appropriately. The weather in the Bay of Fundy can change rapidly, and can be very cool and damp. Fog is common in the evenings, so please, bring lots of warm clothing and good raingear (this includes jacket, pants and boots). Other required gear includes:

- flashlight or headlamp
- sleeping bag, sleeping pad (some pads are available for check out) and pillow
- appropriate clothing for the field: -
  - warm clothes, i.e., fleece, wool, gore-tex, toques, gloves
  - good rain gear (jacket and pants)
  - **long underwear**
  - appropriate footwear (not flip-flops): well-soled sandals/hiking boots/running shoes
  - rubber boots
- personal toiletries including towel (there are showers at the campground on Grand Manan).
- prescription drugs, aspirin or ibuprofen, allergy medication (e.g. Benadryl)
- sunscreen/hat/sunglasses
- bug repellent
- re-usable water bottle
- pencils/pens/clipboard
- small daypack or shoulder bag to carry your things
- waterproof bags (can be plastic and/or dry bags) to keep your stuff dry.
- binoculars
- bird field guide
- field notebook

We will need a few people to bring tents that they are willing to share with others!
Please inform us if you own a tent, and then we will organize people into tents.

Optional field gear

- camera/phone
- additional field guides
- basic snack food & special treats for yourself
- cash, in case you want to purchase anything