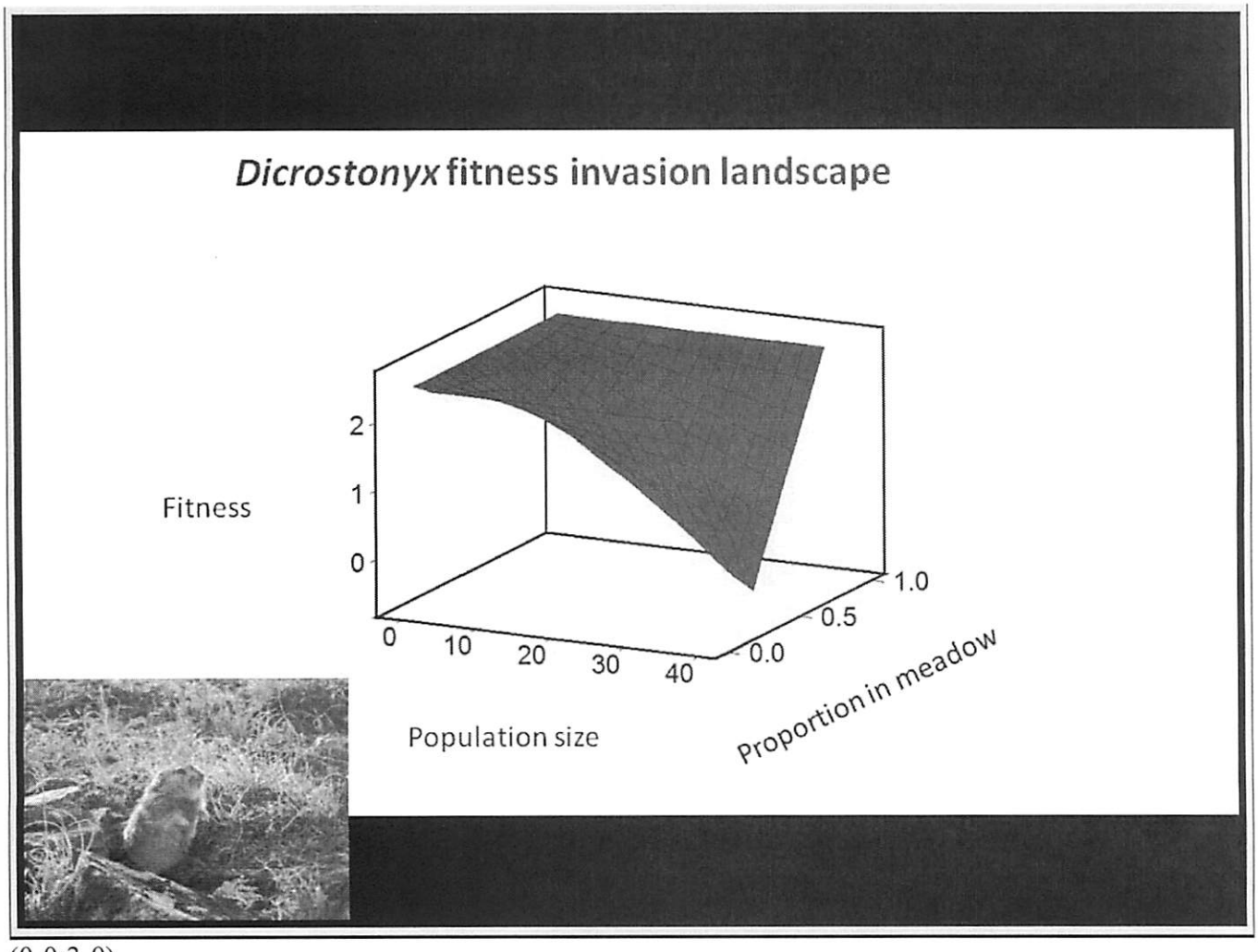
COURSE SUMMARY

EVOLUTIONARY ECOLOGY



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Biology 5131 - 2014

Instructor:

Dr. Douglas Morris

Office: CB4017

Lab: CB3019

Text:

- Candolin, U., & B. B. M. Wong (eds). 2012. Behavioural responses to a changing world. Oxford University Press.

Office Hours:

Tuesday: 13:00-14:00 & Thursday 13:00-14:00 (7 January - 3 April 2014 only)

Other Times by Appointment

Classes: Tuesday 08:30-11:20, Room To Be Announced.

Contents:

Introduction:

This seminar/reading course is designed for the student who wants an introduction to evolutionary ecology with particular reference to behaviour and conservation. The course will be based on a sampling of current problems and approaches. Course instruction will concentrate on assigned readings and student reviews of the contemporary literature. Background lectures may supplement assigned readings. The course will emphasize concepts as well as empirical and experimental approaches to evolutionary behavioural ecology. Students are expected to complete all readings and assignments, to take turns as discussion leaders, and to participate fully in all discussions.

Course Objectives:

1. To help students think about conceptual issues in ecology and evolution.

2. To introduce students to a broad array of relevant and contemporary issues in the study of evolutionary ecology.

3. To expose students to the set of essential concepts, theories, and models required to be "literate" in the study of evolution and ecology.

4. To inspire students to question and discuss current concepts in evolution and ecology.

5. To assist students in developing the skills, discipline, confidence, and study habits necessary for self-instruction in this and other areas of biology.

Evaluation:

Presentations, reports, and discussion - 25%; Class project - 50%; Poster (or Wiki) - 25%. There may be one or more in-class quizzes **that do not contribute** to the course grade.

Performance will be evaluated regularly. The evaluation will be based on the student's grasp of important issues, logical reasoning, non-trivial criticisms of the material, and the ability to solve ecological problems. Students are encouraged to share their ideas and their questions.

All students will be required to lead discussions on assigned readings, to evaluate their own performance and that of their peers, and to review and critique contemporary literature. Students will be expected to integrate recent research and reviews (e.g., Flexibility and constraint in the evolution of mammalian social behaviour. Phil. Trans. Roy. Soc. B 368 [May 2013]). Students will work collaboratively on the class project, and prepare a manuscript, and develop a poster or Wiki *in lieu* of a final examination. Students will have the option of presenting an independent poster on the class project, writing and posting a Wiki on a missing theme in evolutionary ecology, or building a group poster to be displayed publicly during Research and Innovation Week.

Written or oral reports may be assigned at intervals during the course. Evaluation of these reports will be based on the student's ability to synthesize a field of enquiry, to apply that synthesis to a particular problem, or to develop significant new insights into ecological theory. The reports should not, in general, be restatements of review papers. Rather they will require the student to apply what is known (and what is not known) to an unresolved question. Evaluation will be devoted equally to clarity of presentation, rigour of treatment, and suitability of the report to the assignment.

Class Project:

All students will participate in the class project. The theme will be chosen early in the term **NO LATER THAN 21 JANUARY 2014**. The project will take one of two forms. **1,** design and completion of a lab experiment assessing how habitat selection strategies can inform conservation or **2,** a rigorous review of a key unresolved or confusing theme in evolutionary ecology. The project must be approved by the course instructor **NO LATER THAN 21 JANUARY 2014**. Students will review their progress with the course instructor weekly. A final report, written as a manuscript submission to "Evolutionary Ecology Research" must be submitted for grading no later than **1 April 2014**. Authorship on the manuscript will reflect student contributions. All students are expected to contribute equally. Authorship should be either ordered alphabetically or randomly. If contributions are unequal, however, the order of authorship must reflect the relative contribution by each author, and students must submit an addendum explaining each author's respective contribution.

Report Due Date:

The class project report (MS) is due no later than 12:00 **1 April 2014**. Students choosing the independent poster or Wiki option must submit electronic versions of their posters (or Wiki) no later than 12:00 **25 March 2014**. *Posters or Wikis submitted later than 25 March 2014, or a class project submitted after 1 April 2014, will not be accepted for grading.*

Report Style:

Be concise. Use the active voice. Organize your thoughts before you begin writing. Omit needless or redundant words. Express your thoughts as clearly as possible even if it means re-writing the report.

FINAL TERM REPORT

In addition to the class manuscript, each student must either contribute to the class poster for Research and Innovation Week or independently prepare and submit an informative poster or Wiki in the general field of evolutionary ecology. Students are responsible for all aspects including title submission to the Office of Research Services, content, design, printing, laminating, and display in the Agora (for a group poster) or submission of an electronic version if the poster or Wiki represents an independent project.

Posters of exceptional quality will become permanent displays in the Department of Biology. Students must receive the instructor's approval of their proposed poster theme no later than **28 January 2014**. The scope of the posters, and their progress, will be discussed in class.

Students should familiarize themselves with conference instructions on the preparation of scientific posters. General rules include the following:

- Build your poster in MS Powerpoint
- Restrict poster file size to no more than 20 mb
- Ensure that the dimensions of your poster are no larger than what can be printed and laminated locally. Otherwise, the maximum size will be 48 inches on a side
- Maximize the use of figures, and minimize the use of text
- Design all text to be at least 1 cm tall on the finished poster (design the poster to be read at a distance of 1-2 m)
- Select an informative title
- Use numbers (e.g., 2.5 cm tall) to lead your reader through the poster
- Be certain to encapsulate your take-home message in a short concluding statement
- Use no more than 6-8 images
- Be careful if you use a coloured background. Consider a "watermark" on a white background instead
- Place the LU "wordmark" in the top left corner of the poster. If you wish, you can include your

photograph in the top right corner
- Centre the poster's title on the same line as the wordmark, in letters 5 cm high
- Centre the authors' names on the next line, in letters 3 cm tall
- Centre "Biology 5131, 2014, Evolutionary Ecology, Instructor - Dr. Douglas W. Morris on the third line (2 cm lettering)
- Separate the titles and address from the main poster by two horizontal lines
- Use ZIP compression to reduce file sizes (if needed)
- Scrutinize other posters on campus for ideas on presentation style
- Choose colours and a style that are aesthetically pleasing
- Preview a small printed version before printing the full poster. Printer colours rarely correspond with those on your monitor

If your poster is selected for display, you will need to edit it as required, then print and laminate a final version for display in the Department of Biology. You may be required to sign a release allowing your poster to be displayed. The final laminated poster, as well as the display location, must be approved for display by the course instructor. To ensure longevity of your poster, you should choose a topic and message that is unlikely to change dramatically with time.

Please note: The term report is a **term project** and **not** a final examination. Students will be ineligible to write a special examination as outlined in general regulation VII in the Lakehead University Calendar.

CLASS DISCUSSIONS:

Students are required to lead and to participate in weekly discussions. Typically, discussions will consist of a student-led overview of the assigned reading followed by a student-led review of a current sample of the literature (independent study) as well as a workshop aimed at the class project or developing tests of the week's concept(s). Please ensure that you have completed and critically evaluated each reading assignment before the discussion period.

Tentative Timetable 2014

Jan. 7 Chapter 1: Understanding behavioural responses and their consequences

Jan. 14 Chapter 2: Environmental disturbance and animal communication

Jan. 21 Chapter 3: The endocrine system: can homeostatis be maintained in a changing world?

Jan. 28 Chapter 4: Experience and learning in changing environments

Feb. 4 Chapters 5 & 6: Dispersal; Migration

Feb. 11 Chapter 7: Foraging

Feb. 17 - Feb. 22 Study Week - No Classes

Feb. 25 Chapters 8 & 9: Reproductive behaviour; Social behaviour

Mar. 4 Chapter 10: Species interactions

Mar. 11 Chapter 11: Behavioural plasticity and environmental change

Mar. 18 Chapters 12 & 13: Population consequences of individual variation in behaviour; Ecosystem consequences of behavioural plasticity and contemporary evolution

Mar. 25 Chapters 14 & 16: The role of behavioural variation in the invasion of new areas; Evolutionary rescue under environmental change?

Apr. 1 Chapters 15 &17: Sexual selection in changing environments: consequences for individuals and populations; Ecotourism, wildlife management, and behavioural biologists: changing minds for conservation

Scientific Review:

As part of your independent studies, you may be asked to write a scientific review of a recent paper or manuscript in the field of conceptual/evolutionary ecology. Your written review should include the following:

- An assessment of the scientific merit of the work - does it change your world view?
- An assessment of the originality of the work.
- An assessment of the contribution's validity, logic and data analysis.
- An assessment of the length of the contribution relative to its content.
- An assessment of the necessity and quality of all illustrations and tables.
- An overall assessment as to the quality of the work - e.g., exceptional, meritorious, publishable, not publishable (in a separate "cover letter" to your instructor).

Your review should be concise, candid, and non-offensive. Criticize the science, not the author(s). Include positive as well as negative criticisms. Ask yourself, is this review fair, does it tell the editor how to evaluate publication, would I respect these comments if I received this review, and would it be okay if the authors knew my identity? If your answer to any of these questions is "no", revise the review.

Your review should begin with the name of the authors, the title of the article, and its reference number. Follow with a short paragraph placing the work into the context of the discipline and research field, then follow this with a paragraph or two giving an over-view of the paper to demonstrate that you understand the main ideas and approaches. Do not indicate whether the paper should be published or not (this is the responsibility of the editor - your specific comments to the editor would be included in your cover letter). Follow the introductory paragraph with 2-3 paragraphs highlighting the main strengths/weaknesses in the paper. Finish your review with specific suggestions for improvement (you can also highlight passages that are especially relevant or exciting), then type and sign your name at the end.

Theory and Evolution on the Web

- Visit the website for the Theoretical Ecology Section of the ESA at

- Explore a Department of Evolutionary Ecology at

- Examine upcoming and past issues of Evolutionary Ecology at

- AND Evolutionary Ecology Research at

- Read Darwin's "On The Origin of Species by Means of Natural Selection" available on the web at

- Have a look at the Canadian Society for Ecology and Evolution at

Do you belong to a scientific society? Maybe you should join the CSEE/SCEE.