

EEB 3898: Field Methods in Fish Biology

June 2nd – July 3rd, 2014

MWF 9:00 am – 12:00 pm

TLS 371

Course website:

http://hydrodictyon.eeb.uconn.edu/eebedia/index.php/Field_Methods_in_Fish_Biology

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Course Objectives:

This course is an introduction to the biology of fishes and field sampling methods, with emphasis on local species. Throughout the course, I will use lecture, discussion and demonstration, but emphasize a hands-on approach (i.e., you will learn by doing!). For this reason, your attendance and participation for each class is mandatory.

During the course you will do the following:

1. Collect local freshwater and saltwater fish species using common fish sampling methods
2. Identify and classify local freshwater and saltwater fish species
3. Create a biodiversity collection of representative Connecticut fish species
4. Collect, analyze and interpret data related to population and community structure of a local freshwater fish species
5. Read and synthesize relevant scientific papers

Required materials:

1. **COURSE BOOK:** A Pictorial Guide to Freshwater Fishes of Connecticut by Robert Jacobs and Eileen O'Donnel. CT DEEP, Bulletin 42. Available at DEEP bookstore for \$19.95
Purchase here: <http://www.ctdeepstore.com/Pictorial-Guide-to-Freshwater-Fishes-of-Connecticut-661.htm;jsessionid=8A2B27BFEABA2DB5895568ECF38651DC.m1plqscsfapp05>
2. Field notebook that is water resistant and pencils. Available at the UConn Co-op.
3. Appropriate field clothing and footwear – you WILL get wet! (i.e., wicking (non-cotton) clothing or old clothing you don't mind ruining; boots or old sneakers)
4. Mask and snorkel

Materials strongly recommended:

5. Sunscreen
6. Sunglasses
7. Bug spray
8. Skin cleanser for poison ivy (e.g., tecnu cleanser)

Assessments and grading:

Your course grade will be based on points earned out of a possible 250. I do not plan to curve grades in this class. I will be using a standard scale for grading: 90%-range is A or A- (specifically, 90%-93% = A-, 93%-100% = A), 80% range is B or B-, 70% range is C or C-, 60% range is D or D-, and below 60% is an F.

Assessment	Points	% of total grade	Due date*
Hourly Exam I - midterm	50	20%	18 June
Hourly Exam II - final	50	20%	3 July
Final Report	50	20%	3 July
Biodiversity Collection Project	20	8%	3 July
Identification Quiz I: freshwater fishes	10	4%	9 June
Identification Quiz II: freshwater fishes	10	4%	18 June
Identification Quiz III: saltwater fishes	10	4%	27 June
Field notebook check I	10	4%	18 June
Field notebook check II	10	4%	30 June
Field exercise report I	10	4%	9 June
Field exercise report II	10	4%	16 June
Field exercise report III	10	4%	23 June

* All dates subject to change

Hourly exams: There will be two hourly exams (a midterm and a final) that will be based on course lectures, discussions, readings and field and lab exercises. The final is non-cumulative. Exam questions will be a mixture of short answer and multiple-choice format.

Final report: You will write a scientific paper (3-5 pages) assessing how populations and communities of fish change from headwater streams to large order rivers. You will collect data for your final report throughout the course. Your report must include a thoughtful and complete introduction, methods, results (with figures and/or tables), and discussion sections.

Biodiversity collection project: You will collect and preserve specimens and create a collection representative of Connecticut's fish diversity. Working **in groups of 3**, you must to collect, fix and preserve at least 10 different species. You will be graded on a) the diversity of your collection, b) the quality of the preservation, c) your ability to properly identify the species and include the appropriate collection information.

Identification quizzes: There will be three quizzes that will test your fish identification skills. There will be class time set aside to hone these skills, but you will also need to study from the field guide at home. For each quiz, I will show you preserved or frozen specimens and/or images for you to identify.

Field notebook checks: The field notebook is an important component of field methods in fish biology. It should go with you **everywhere**. Twice this semester, I will check the notebook for completeness. It is imperative that you take good notes during our field trips since you will write three exercise reports and a final project report based on the field data you collect. Notebook guidelines will be discussed the first day of class.

Field exercise reports: There will be three field exercise reports due throughout the course. These reports are short (2 pages) summaries of the objectives, methods and results of our major field trips. I will provide you with an outline for each report. Each report will focus on a different set of measurements and a different field sampling method as follows: Field exercise I will address assessment of size and condition of focal species using seine gear; Field exercise II will address assessment of population abundance; Exercise III will address measures of community assemblage structure.

Tentative Schedule*:

Day	Topic	Assignment
M 2 June	Introduction to fish biology and field methods; active gears and gear bias Field exercise: beach seine, minnow trap Swan Lake	Read "How to read a scientific article;" Read <i>Poos et al 2007</i> , in-class discussion questions on Friday
W 4 June	Field exercise: beach seine, minnow trap Mansfield Hollow Reservoir	Read <i>Fink et al. 1979 Section I</i>
F 6 June	CT fish diversity; electroshocking gears; curation of fish collections Lab exercise: identify and preserve specimens; external anatomy, morphometrics and meristics	Quiz I study; Field exercise report I
M 9 June	Identification Quiz I Field exercise: Electrofishing Eldredge Brook with Jason Vokoun	Field exercise report I due; Read <i>Gorman and Karr 1978</i>
W 11 June	Field exercise: seine Willimantic River with Jason Vokoun	
F 13 June	CT fish diversity; passive gears; river habitats Lab exercise: identify and preserve specimens	Field exercise report II, Read <i>Post et al 2008</i>
M 16 June	Field exercise: Boat electrofishing with DEEP and retrieval of hoop nets, Connecticut River	Field exercise report II due; Exam I study
W 18 June	Exam I and Quiz II <i>Tentative:</i> Alewife night trip	Field notebook check I
F 20 June	Lab exercise: Internal anatomy, parasite dissections, collecting hard parts for ageing	Field exercise report III
M 23 June	Field exercise: Seine Morris Cove with NOAA biologist Joe Pereira	Field exercise report III due
W 25 June	Long Island Sound fish diversity; visual observation methods; population and community ecology of fishes Lab exercise: Identify and preserve saltwater fish	Quiz III study; Read McKinley et al 2001

F 27 June	Identification Quiz III Field exercise: Visual observation methods – sunfish nesting and ethograms	Read “ <i>Guidelines to writing a scientific paper</i> ”
M 30 June	<i>Tentative: Visual observation techniques – population abundance, and/or age analysis of hard parts</i>	Ethogram due (in notebook) Field notebook check II at end of class
W 3 July	Finalize and present biodiversity collection Final Exam	Final report due

*This schedule is dependent on daily weather conditions. We will not conduct field exercises in heavy storms, though we WILL fish in the rain!

Additional information:

Students with disabilities: University students with disabilities are some of the brightest and most dedicated learners on campus, and the University of Connecticut is committed to achieving equal educational opportunity and full participation for persons with disabilities ([University policy on people with disabilities](#)). Qualified individuals who require reasonable accommodations are urged to make their needs known as soon as possible, and should contact the [Center for Students with Disabilities](#).

Academic misconduct: Academic misconduct in any form is in violation of the University of Connecticut *Student Code* and will not be tolerated. This includes, but is not limited to: copying or sharing answers on tests or assignments, plagiarism, and having someone else do your academic work. Depending on the act, a student could receive an F grade on the test/assignment, F grade for the course, and could be suspended or expelled from the University. Please see the [Community Standards](#) and [Student Code](#) pages on the Dean of Students website for more details and a full explanation of the Academic Misconduct policies.

Literature used in this course:

- Bonar, S. A., W. A. Hubert & D. W. Willis. 2009. *Standard methods for sampling North American freshwater fishes*. Bethesda, Maryland: American Fisheries Society.
- Cailliet, G. M., M. S. Love & A. W. Ebeling. 1986. *Fishes: A field and laboratory manual for their structure, identification, and natural history*. Belmont, California: Wadsworth, Inc.
- Fink, W. L., K. E. Hartel, W. G. Saul, E. M. Koon & E. O. Wiley. 1979. A report on current supplies and practices used in curation of ichthyological collections. American Society of Ichthyologists and Herpetologists.
- Helfman, G. S., B. B. Collette, D. E. Facey & B. W. Bowen. 2009. *The diversity of fishes*. West Sussex, UK: Wiley-Blackwell.
- Jacobs, R. P. & E. B. O'Donnell. 2009. *A pictorial guide to freshwater fishes of Connecticut*. Hartford, Connecticut: Connecticut Department of Environmental Protection.
- Murphy, B. R., D. W. Willis, M. D. Klopfer & B. D. S. Graeb. 2010. *Case studies in fisheries and conservation management: applied critical thinking and problem solving*. Bethesda, Maryland: American Fisheries Society.
- Zale, A. V., D. L. Parrish & T. M. Sutton. 2012. *Fisheries Techniques*. Bethesda, Maryland: American Fisheries Society.