

# EEB 3898: Field Methods in Fish Biology

June 10 – 28, 2013

M-F 1:00 pm – 4:00 pm

TLS 371

Course website:

[http://hydrodictyon.eeb.uconn.edu/eebedia/index.php/Field\\_Methods\\_in\\_Fish\\_Biology\\_2013](http://hydrodictyon.eeb.uconn.edu/eebedia/index.php/Field_Methods_in_Fish_Biology_2013)

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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
6. Apply knowledge to conservation and management problems

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 \$26.95.  
Purchase here: <http://www.ctdeepstore.com/Freshwater-Fishes-pictorial-guide-paperback-book-combo-662.htm>
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 – a cheap one from Wal-Mart would be fine.

Suggested materials:

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%	19 June
Hourly Exam II - final	50	20%	28 June
Population and Community Project Report	50	20 %	28 June
Biodiversity Collection Project	20	8%	27 June
Identification Quiz I: freshwater fishes	10	4%	13 June
Identification Quiz II: freshwater fishes	10	4%	18 June
Identification Quiz III: saltwater fishes	10	4%	25 June
Field notebook check I	10	4%	19 June
Field notebook check II	10	4%	28 June
Field exercise report I	10	4%	17 June
Field exercise report II	10	4%	20 June
Field exercise report III	10	4%	24 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.

Population and community ecology project report: You will write a scientific paper (3-5 pages) using data we collect on the population structure (population abundance, size and age structure and condition) of a focal fish species. You will also assess community structure using different indices of species richness and diversity. For this project, we will collect data use seines and trap nets in two ponds that differ in amount of anthropogenic disturbance. Your report must include a thoughtful and complete introduction, methods, results (with figures and/or tables) and discussion sections.

Biodiversity collection project: As a class, we will collect and preserve specimens and create a representative Connecticut biodiversity collection. Working **in pairs**, 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 a detailed 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 of two or more species using passive entrapment gear; Exercise III will address measures of community assemblage structure using electrofishing and seine gear.

Tentative Schedule\*:

<b>Day</b>	<b>Topic</b>	<b>Assignment</b>
M 10 June	Introduction to fish biology and field methods Lab exercise: external anatomy and finding and measuring characters	Read "How to read a scientific article;" finish Lab exercise in notebook
T 11 June	Freshwater fishes I; active gear types and gear bias Field exercise: Beach seine bicentennial pond and minnow traps	Read Bain and Meixler 2008, in-class discussion questions on Wednesday; Read Fink et al. 1979 Section I
W 12 June	Species identification and curation of fish collections Lab exercise: identify, fix and preserve fish Field exercise: retrieve minnow traps	Quiz I study
Th 13 June	<b>Identification Quiz I</b> Freshwater fishes II; electroshocking gears Field exercise: Beach seine Mansfield hollow and purse seine	Field exercise report I due Monday
F 14 June	Field exercise: Stream backpack electrofishing at Eldridge brook (with Dr. Jason Vokoun)	
M 17 June	Freshwater fishes III; passive gear types Lab exercise: identify, fix and preserve fish Lab exercise: dissections and GSI	Quiz II study
T 18 June	<b>Identification Quiz II</b> Field exercise: Boat electrofishing with DEEP and retrieval of hoop nets	Exam I study; Field Exercise report II due Thursday
W 19 June	<b>Exam I; field notebook check</b> Saltwater fishes of CT; visual observation methods; population and community ecology of fishes	Read Neff et al. 2004

	Lab exercise: fix and preserve fish	
Th 20 June	Field exercise: Seine Fenton river (with Dr. Vokoun)	Field exercise report III due Monday
F 21 June	Field exercise: Seine Morris Cove with NOAA	
M 24 June	Lab exercise: Identify, fix and preserve saltwater fish Field exercise: Visual observation field trip	Quiz III study; Read Jeppsen et al. 2010
T 25 June	<b>Identification Quiz II</b> Field exercise: Population and Community Ecology project data collection: seine and set up trap nets/hoops nets	Read "Guidelines to writing a scientific paper; Write introduction and methods for final report
W 26 June	Field exercise: Population and Community Ecology project data collection: seine and collect trap nets	Intro and methods due Thursday; analyze data and write results section of report
Th 27 June	Age analysis of hard parts; data analysis Lab exercise: ageing of focal species by scales; finalize biodiversity collection	Exam study; finish report
F 28 June	<b>Exam II; field notebook check</b> <b>Final report due at 5pm</b>	

\*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:

- Bain, M. B. & M. S. Meixler (2008) A target fish community to guide river restoration. *River Research and Applications*, 24, 453-458.
- 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.
- Jeppsen, E., M. Meerhoff, K. Holmgren, I. Gonzalez-Bergonzoni, F. Teixeira-de Mello, S. A. J. Declerck, L. De Meester, M. Sondergaard, T. L. Lauridsen, R. Bjerring, J. M. Conde-Porcuna, N. Mazzeo, C. Iglesias, M. Reizenstein, H. J. Malmquist, Z. Liu, D. Balayla & X. Lazzaro. 2010. Impacts of climate warming on lake fish community structure and potential effects on ecosystem function. *Hydrobiologia*, 646, 73-90.
- 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.
- Neff, B. D., L. M. Cargnellie & I. M. Cote. 2004. Solitary nesting as an alternative breeding tactic in colonial nesting bluegill sunfish (*Lepomis macrochirus*). *Behavioral Ecology and Sociobiology*, 56, 381-387.
- Zale, A. V., D. L. Parrish & T. M. Sutton. 2012. *Fisheries Techniques*. Bethesda, Maryland: American Fisheries Society.