CONSERVATION BIOLOGY
BIOL 347
SPRING QUARTER 2009

DR. JOSEPH S. WALSH
Lecturer, Program in Biological Sciences
Office: Hogan 6-110A
Phone: 491-5098
Email: j-walsh1@northwestern.edu
Office Hours: Tues., Wed., & Thurs. 2:00P - 3:00P, or by appointment.

CLASS MEETING TIMES:

Lecture: TuTh 9:30-10:50A, Tech M177

PREREQUISITES:

ENVR_SCI 202 is preferred, but BIOL 210-1 or BIOL 164 are also accepted; STAT 202, 206, or 210. Prerequisites waived only by permission of instructor.

REQUIRED TEXT:

Primack, R. B. 2006. *Essentials of conservation biology.* 4th ed. Sinauer Associates, Sunderland, MA. ISBN 0-87893-720-X. Selected readings from primary literature available online. A copy of the required text is on reserve in SEL.

DESCRIPTION:

Conservation biology is an integrated science based on primarily on ecology, with important contributions from genetics, evolution, and biogeography, as well as non-biological disciplines, including economics, politics, and ethics. The first half of the course: addresses the definitions, origins, and patterns of biological diversity; explores why the maintenance of biodiversity in natural (and unnatural) ecosystems is fundamentally important to the continued well-being of humans and other species; examines the context and causes of extinction. The second half of the course deals with strategies and tactics for preventing or ameliorating the loss of biodiversity and restoring ecosystem function. Specific topics include: the biology of small populations (including population viability analysis); the selection, design, and management of protected areas; ecological restoration; conservation design, legislation, and other higher-level strategies.

GRADING:

Detailed requirements for each assignment listed below. Final grade for the course will be weighted as follows:

1st midterm exam (Tues., 28 April, in class)	20%
2nd midterm exam (Fri., 12 June, 9:00-11:00A)	20%
Four assignments (10%, 10%, 10%, 30%)	60%

CLASS SCHEDULE & READINGS

1	Tu	Mar 31	Introduction	Ch. 1
2			Units of biological diversity	Ch. 2
3	Th	Apr 2	Distribution of biodiversity	Ch. 3
4	Tu	7	Direct values of biodiversity	Ch. 4
5			Indirect values of biodiversity	Ch. 5
6	Th	9	Indirect values of biodiversity (cont'd.)	
7	Tu	14	Ethical considerations	Ch. 6
8			Patterns of extinction	Ch. 7, exc. 147-150
9	Th	16	Vulnerability to extinction	Ch. 8
	Sa	*18*	*Field trip 1: Restoration at Somme Prairie Grove 1P-4P*	
10	Tu	21	Causes of extinction: habitat loss	pp. 147-150
			500-word critique due	
11			Causes of extinction: habitat loss (cont'd.)	Ch. 9
12	Th	23	Causes of extinction: exotics, hunting	Ch. 10
	Su	*26*	*Field trip 2: Restoration at Somme Woods 9A-12P*	
	Tu	28	*Exam 1 (diversity & extinction; 3/31 through 4/23)*	
13	Th	30	Minimum viable populations	Ch. 11
14			Population viability analysis	Ch. 12
	Sa	*2*	*Field trip 3: Restoration at Oxbow Prairie 9A-12P*	
15	Tu	May 5	Reintroductions	Ch. 13
			Fish fauna analysis due	
16			Seed banks, etc.	Ch. 14
17	Th	7	Choosing protected areas	Ch. 15
18	Tu	12	Designing protected areas	Ch. 16
19			Managing protected areas	Ch. 17
20	Th	14	Outside protected areas	Ch. 18
	Fr,Sa	*15,16*	*Field Trip 4,5: BioBlitz at Indiana Dunes National Lakeshore*	
21	Tu	19	Restoring degraded areas	Ch. 19
22			Conservation at local levels	Ch. 20
23	Th	21	Conservation at international levels	Ch. 21, 22
24	Tu	26	A new model (Chicago Wilderness)	
	Th	28	Unfinished business	
	Tu	Jun 2	Reading Week begins.	
	Mo	8	*Exam 2 (conservation methods; 4/30 through 5/28) due by 5P*	

OVERVIEW OF ASSIGNMENTS

1. **Field trip participation**: Attendance and enthusiastic participation in one of the field trips is worth 10% of the grade. Emailing me by 5P, Monday, April 6, is the first 5%.

2. **500-word critique**: This is a short critique of any ONE of the "diversity-stability" papers in the *Assignments* folder online. You will very briefly review the experiment or observations and results, then provide a substantive critique of the discussion of the implications of the findings. This assignment is worth 10% of the grade. More later.

3. **Fish fauna analysis**: This is an analysis of patterns of diversity in the fish fauna of a protected area in the Midwest. You will prioritize tributaries of a small river for conservation based on fish species abundance and distribution. This assignment is worth 10% of the grade. More details will be provided later.

4. **Group project**: These have varied over the years; examples include: a "Biodiversity Literacy Quotient" (BLQ) of people on the Northwestern campus, examining attitudes and knowledge at different scales (campus, local, Midwestern, and global diversity); a *Northwestern Atlas of Biodiversity*, analogous to the Chicago Wilderness publication of the same name, on the history of the campus, the plant communities that are found on campus, the distribution and abundance of various taxonomic groups (plants, birds, mammals, etc.), generate a self-guided walking tour of campus biodiversity, etc.; proposals to establish a sustainable prairie plot on the lakefill; others have been done. To ensure even levels of contribution to the final projects, group members rate one another's level of contribution to the final project, including their own, via confidential email to me, and this will be considered in assigning the grade. This assignment is worth 30% of the grade. More details will be provided later.

OTHER GENERAL CONSIDERATIONS

- You are responsible for anything posted to Blackboard, so check it regularly.
- *All* assignments must be typed, not handwritten.
- Late assignments lose one letter grade per day, starting at noon on the due date.
- Hand in hardcopies of assignments, but be prepared to email me your assignments as well. I may require you to do this if, e.g., I find your critique particularly well-written and wish to retain a copy, say, to use as an example of good writing in my freshman seminar, etc. (with your permission, of course).
- In all assignments, use the usual citation format you find in journal articles (as below; do not use footnotes). Failure to properly attribute sources will be *extremely detrimental* to your grade. Whenever you cite a fact, the author and year of the source must immediately follow that fact in parentheses, so that the reader can look up the article from which it came in your Literature Cited (e.g., *fact* "(Tilman et al. 1996)"). Please refer to the *Academic Integrity* pamphlet you received in your freshmen seminars, or consult with the Writing Place, if you are uncertain how to properly attribute sources. Also, do not use quotes; write all material in your own words.

ASSIGNMENT 1: FIELD TRIP

You are required to attend one of the field trips, as noted in the course description. While there is no field trip-associated assignment this year, these really are fun ways to spend a day outdoors doing some hands-on learning, and connecting the dots between lecture and reality. I know student schedules are busy, but everyone enjoys these and wishes we had time to do more. There are 5 field trip possibilities on the schedule. *You must email me by Friday 3 April, with your ranked preferences* (1st is your strongest preference, 5th is least preferred). *If you absolutely cannot make a particular trip, note which one and why*. You need to get this information to me as soon as possible, because, a) not all trips will be offered, and b) I need to choose which ones we are doing & schedule buses, etc., right away. The trips will be limited in size to better facilitate engagement and discussion. Note that these trips are "rain or shine".

1. **Restoration workday:** The minibus will leave from the Garrett parking lot at 8:30A; do not be late! After a half-hour drive to the site, we will spend the morning with the North Branch Restoration Project working to restore native habitats (tallgrass prairie or oak woodland). This trip involves strenuous physical activity. We will pull garlic mustard, cut buckthorn, and perhaps gather native seeds. Dress appropriately; wear layers, and put on your grungiest t-shirts and jeans and boots. The ground will be muddy. We may also be burning a brushpile of cut buckthorn, so either wear cotton or wool, or do not get downwind of the fire, as embers burn rapidly through anything synthetic (nylon, etc.). Bagels & water are provided at around 10:30A. These are also good days to take notes, as you may get to meet some very important figures in conservation and learn a lot from them. These sites are also fantastic places for bird- and plant-watching, so bring binoculars, cameras, hand lenses, etc. We will depart at about 12:00P and return to campus between 12:30 and 1:00P. The later workdays leave at 12:30P and return by 5:00P.
2. **BioBlitz:** The Indiana Dunes National Lakeshore is a unit of your National Parks system, and is about 1-2 hours away depending on traffic. The activities would be helping out with collecting & identifying plants & animals in what is both a fun celebration and an attempt to document the prodigious variety of species found in the park. Very likely there will be several hundreds of participants from all over the region, including taxon leaders (Field Museum, etc., folk with particular taxonomic expertise) guiding the inventory of various groups. One might be looking for fungi, wading for frogs, etc., so plan on getting dirty. I have not done one of these before, so I do not yet have details on exactly what we would be doing, but I do know it would be an all day trip, probably leaving about 8:00A & returning about 6:00P.