

# BIOLOGY 144 - PRINCIPLES OF CONSERVATION BIOLOGY

Spring, 2012

**Instructor:** Dr. Michael Reed

**TA:** Jen Mortensen

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**Class hours:** Barnum 104, Mon, Wed, 1:30-2:45

**Text:** ESSENTIALS OF CONSERVATION BIOLOGY, 5th ed., Primack

**Reading assignments:** Chapters from the text, and readings from the primary literature (on Trunk), associated with the lectures are listed on the next page.

## Course requirements and grading

- 1) Two mid-term exams (total 50% of final grade) [there is no final exam]
- 2) Management Plan poster and associated materials (35% of final grade)
  - Topic must be approved by March 7; first come, first choice
  - 1/3 of grade determined partly by peer (your fellow students) evaluation
- 3) Evaluation of other students' Management Plan posters (5% of final grade) – your evaluations will be confidential to the students being evaluated
- 4) During semester you will be assigned 8 papers from the primary literature to read before a particular lecture. Due dates are on syllabus. For each paper, at the start of class, you will hand in a typed statement – of one thing that surprised you about the paper – with regards to the Methods, Analysis, Results, or Interpretation of the results – and why you were surprised (10% of final grade). If you don't attend the lecture (discussion of the paper), your surprise statement will not be accepted.

Notes about grading:

- Exams will NOT be cumulative, EXCEPT when material is repeated in the new examination period.
- Make up exam policy: NO make-up exams (except in extraordinary & documented circumstances)
- You must be present for both days of poster presentations.
- NO, there is no extra credit – please don't ask.
- If you have a question regarding how an exam question was graded, after reviewing the posted exam key you need to submit in writing why you think your answer might be correct, along with your exam. This must be done *within 7 days* of my returning the exam to the class. The exam key will be posted on the wall outside Ba 216 (not on Trunk).

<b>Date</b>	<b>Topic</b>	<b>Text Chapter</b>	<b>Primary Literature</b>
Jan. 23	What is Conservation Biology?	1; 6	
	25 Forms of biodiversity	2	
	30 Patterns of biodiversity	3	Mora et al. 2011
Feb. 1	Extinction rates	7	
	6 Vulnerability to extinction	8	
	8 Habitat loss & degradation	9	
	13 Overexploitation	10	Packer et al. 2011
	15 Exotic, invasive species & disease	10	
	22 Climate change	pp. 204-213	Martin & Maron 2012
	23 Problems of small populations	11	
	27 Conservation genetics	11	Hoeck et al. 2009
	29 <b>EXAM I</b>		
March 5	Population viability analysis	12	
	7 Establishing new populations	13	Ranius & Roberge 2011
	<b>Management plan topic due by today</b>		
	12 Surveying & monitoring	–	
	14 Ex situ approaches	14	Piña-Aguilar et al. 2009
	26 Protected areas & protected areas networks	15; 16	
	28 Managing protected areas	17	
April 2	Managing the matrix	18	
	4 Habitat restoration	19	Meyer et al. 2010
	9 Economics of conservation	4; 5	
	11 Ecosystem services	20	
	18 Sustainability	20; 21	Lovich & Ennen 2011
	23 <b>EXAM 2</b>		
25 & 30	Poster presentation & evaluation ( <u>all posters due 25<sup>th</sup></u> )		

## Management Plan Poster

Students will work in teams of 2 to prepare a management plan, and present it as a poster. Posters are one of the primary methods people in the scientific community communicate research results. The management plan can be for recovery of a threatened or endangered species or ecosystem, or a plan to control an exotic invasive species or emerging disease whose invasion is causing biodiversity problems. Each team will prepare a **poster, and turn in a bibliography** (hard copy) of materials used in developing your management plan. Citations in the bibliography should be mostly from the primary scientific literature, and must include at least 5 sources from the primary literature. The bibliography must be typed in the form of the journal Conservation Biology – any other formatting will be counted as not being cited. If you do not know what constitutes primary literature, see me or Regina Raboin in the library.

Proposed Management Plan topic must be cleared with me before you start work, and the latest you can clear a topic is **March 7**. By this date, you must provide at least 5 citations from the primary literature (= scientific journal articles). Submit topics and citations and/or come talk to me about possible topics **AS EARLY AS POSSIBLE** to avoid being scooped – only one group per species / problem, so first come first served. Before you select a species/ecosystem you should do a literature search to make sure there is sufficient information to tackle the project. Do not cite articles that you did not read.

Management plans already exist for many species or ecosystems – your selected project may not be a repeat of an already proposed or completed project. If you select a species or ecosystem with an existing management plan, you need to (1) propose something that goes beyond the existing plan, (2) make it clear in your poster what is new to you and what is not, and (3) turn in a reference to the existing plan so I can see what you did that was different.

Posters will be on display on the dates listed in the syllabus; half the class will present and answer questions one day and evaluate the posters the other; the next day, roles will switch. All posters must be completed and brought in by the first presentation date. Both members of each team will be expected to answer questions regarding management plans when people come to view the posters. Each student will formally evaluate 3 other groups' posters in order to practice thinking critically and assessing others' work and your evaluation will be graded. Your grade will be based on your doing a careful, constructive job of reviewing posters – if you say a poster is great when it is not, your evaluation grade will go down. Also, students will assign a grade to each poster they evaluate, and their grading will affect the poster's final grade.

### *Selecting a Species / Ecosystem*

The scientific literature, popular literature, news, personal experience, and the Internet are filled with examples of endangered or threatened species and ecosystems, and conflicts between environmental and other concerns. You can use any of these sources for an initial selection of a problem to be addressed. Your next step is to search the **scientific literature** to see what information exists that could be used to develop a management plan for a specific area. Please come discuss ideas with me. Web of Science or Scopus are the best places for searches of primary literature, but Google Scholar is getting better.

### Some example scientific journals that focus on Conservation Biology:

Animal Conservation	Conservation Letters
Biodiversity & Conservation	Ecological Applications
Biological Conservation	Invasion Biology
Bird Conservation & Ecology	Journal of Applied Ecology
Conservation Biology	Journal of Wildlife Management
Conservation Ecology (on line)	Restoration Ecology

**Some potentially useful Web sites for getting ideas.** (There are tons of them of varying quality. These sites are NOT scientific literature, but they might lead you to some.)

The World Conservation Union (IUCN)  
[www.iucn.org](http://www.iucn.org)

Wilderness Network  
<http://www.wilderness.net/>

US Fish & Wildlife Service  
<http://endangered.fws.gov/>

The Society for Conservation Biology  
<http://conbio.net/scb/>

Endangered Species - Main Page  
<http://eelink.net/EndSpp/>

World Wildlife Fund  
<http://www.wwf.org/>

EDGE (Zoological Society of London)  
<http://www.edgeofexistence.org/home.asp>

Endangered Species Coalition  
<http://www.stopextinction.org/>

### *Poster format*

#### **Title & presenter names**

**Abstract:** In 350 words or less, summarize your management plan. State the problem, why it is a problem, where it is a problem, and the major findings and recommendations of your management plan. No citations appear in the abstract.

**Introduction:** Introduce the general conservation/management problem, then narrow the focus of the introduction to your specific management problem. Give the location, interested parties (for many projects this will include who is in conflict), and state your specific goals for the project. By the end of the section a reader should know what you are doing and why.

**Background:** A brief review of the location and species involved. If your management plan focuses on a single species, give me a summary of its pertinent natural history, ecology, and behavior. If it is an ecosystem, tell me about the ecosystem (biome, primary species, etc).

**Proposed management plan:** This is the bulk of your project. What do you propose to do? What is your reasoning? Design your management plan as an experiment (= adaptive management). That is, you plan to do “x”, and you expect “y” to occur. This means you should state your plan as a **hypothesis**, or set of hypotheses, or predictions. Include predictions – what specifically should result from your management plan?

**Quantifying success:** How does your management plan address and solve the problem? What were you not able to deal with? Define “success” for your management plan, and provide criteria for assessing success (or failure).

**Literature Cited:** *To be handed in separately at time poster is displayed.* All ideas, data, information not your own must be cited, unless they are ideas common in the literature (e.g., that plants photosynthesize). All citations must come from the scientific literature. This includes scientific journals, symposia, and some government reports (but not all). When in doubt, ask me. The literature cited section should contain all citations used, and no extras. **Format** for the literature cited section must follow format of the journal *Conservation Biology*. It might help to view. **A Biologist's Guide to Library Resources:** <http://ase.tufts.edu/biology/bgguide/>

**Citing Web pages:** **DO NOT**, unless it is an on-line journal; then cite web page, journal number, and page numbers. The only acceptable use of other Web citations is if you want to document a popular interest in the topic.

**PROOFREAD YOUR POSTER.** I guarantee that if you wait to the last minute to do this project it will show in the quality of your work.

**Lazy team members:** If you believe your partner is not being productive, and you cannot get him/her to be productive, tell me.

### ***Poster tips***

Your goal for a poster is to distill the information for your management plan into short, clear paragraphs, illustrations, and/or tables in a space not exceeding 1 meter tall by 1.3 meters wide.

1. Everything should be easily readable from at least a meter away. Recommendations: Arial font is easy to read. Abstract & headings: 36 pt; text 32 pt; title: 72-80 pt.
2. If you are having trouble making everything fit, look to see if you have included irrelevant information.
3. Graphs, figures and tables can be pre-mounted on colored paper or poster board for ease in setting up your poster and to highlight the material. Each figure or table should be numbered and referred to in the text of the poster. Each should have a heading of one or more lines that provides a brief (one or two lines) "take home" message.
4. Choose fonts that are easy to read, don't overuse bold or italics. Background colors should draw attention to material, but not detract from presentation – avoid fluorescent colors. Backgrounds to text that are pictures make the text difficult to read.
5. Some relevant pictures can make a presentation more aesthetically presentable, and easier to read.
6. Avoid unnecessary details in preparing figures, drawings or illustrations. Try to keep everything straight forward. If you are copying a figure and the font is too small, rewrite it!
7. Ideally, your poster should be self-explanatory so that you are free to supplement and discuss particular points raised by visitors.
8. If you use a picture or diagram from the Web or other sources, be sure to attribute it.
9. Arrange material in columns rather than in rows. It is easier for viewers to scan a poster by moving systematically down then across rather than zigzagging back and forth. Figures should be numbered, with matching reference in text. An abstract should be placed at the upper left or center. Make sure your names appear on the poster under the title.