

## **Economic and Social Aspects of Conservation Biology**

CBIO 8004

Spring 2014, 3 credits

Tuesday and Thursday 8:45 – 10:00

BioScience 12

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### **Course Description:**

This course is the second semester of a yearlong introductory course for graduate students in the Conservation Biology Graduate Program. Other graduate students who are interested in aspects of conservation biology are welcome to enroll. Conservation biology is a mission-oriented science that focuses on how to protect and restore biological diversity. During the first semester we covered much of the scientific basis underlying conservation including genetics, population biology, landscape ecology, as well as systematic conservation planning, ecosystem services, and environmental ethics. During this semester we will apply concepts and methods from ecology, economics, political science and other fields to study scientific and policy issues relevant to the conservation of biological diversity.

### **Course Goals**

The overall goal for the yearlong course is to provide you with an introduction to the current ecological, economic, social and policy underpinnings of conservation biology and the application of these principles to conservation challenges.

By taking this course, you will:

- Develop a comprehension of the fundamental ecological principles underlying conservation biology;
- Develop a comprehension of the fundamental principles underlying economic, political and social systems that affect the conservation of biological diversity;
- Develop an understanding of the interdisciplinary challenges of implementing conservation practices;
- Develop an appreciation for the myriad perspectives among conservation biologists, decision-makers, and the public at large.
- Develop your skills in writing for publication and in communicating issues to the public.

### **Class Format:**

Class material will be presented through a combination of lecture and discussion, including participatory learning activities, and informal writing assignments. There will be two 75-minute class periods per week, with each class period typically structured around 1-3 assigned articles, which everyone is expected to read before class. Electronic copies of readings will be available on the UMN Moodle web site ([www.moodle.umn.edu](http://www.moodle.umn.edu)).

### Credits and Workload Expectations

In keeping with official UMN policy, this 3-credit class should require a minimum of 9 hours of work per week for the average student. Classroom activities will account for 3 of those hours, so you can expect to spend at least 6 additional hours per week on out-of-classroom activities. Most of this time will be spent reading and reflecting. **Do not take this class unless you are prepared to invest ample time in careful reading and reflection.**

### Evaluation:

We will follow the University of Minnesota's Uniform Grading Policy.

A	Achievement that is <b>outstanding</b> relative to the level necessary to meet course requirements.
B	Achievement that is <b>significantly above</b> the level necessary to meet course requirements.
C	Achievement that <b>meets</b> the course requirements in every respect.
D	Achievement that is <b>worthy of credit</b> , even though it fails to meet fully the course requirements.
F	Represents failure and signifies that the work was either: 1) completed but at a level <b>not worthy of credit</b> , or 2) <b>not completed</b> and there was no agreement between the student and instructors that the student would be awarded an Incomplete.

In addition to the letter grades listed above, we will also award pluses and minuses. Incompletes will only be assigned in the case of extraordinary circumstances arising late in the semester that prevent normal completion of course requirements. If you enroll with S/N grading, you must complete all course requirements and earn a C- or better to receive a grade of S (Satisfactory).

Component of Grade	%
Take-home Exam	15
Active participation in class discussion	10
Daily Questions	10
Problem Set	10
Review Paper Draft	10
Peer Review of Two Classmates Review Paper Drafts	10
Review Paper Final	10
Group Presentation	15
Opinion Piece	10
<b>Total Points</b>	<b>100</b>

**Attendance:** Because our course will depend on in-class participation, attendance at all schedule class meetings is expected. Please contact us in advance if you must miss a class session.

## Assignments:

### *Take-home exam*

A take-home exam will be handed out in class on April 8<sup>th</sup> and will be due by 5 pm on April 15<sup>th</sup>. The exam will cover material from the beginning of the semester up through the section on fisheries and marine conservation. The exam will be open-book and open-note but you are not to talk to others about the exam until after you have turned it in.

### *Daily questions*

This class requires active participation, but you can't participate unless you come to class fully prepared, having carefully read and considered the assigned readings. For each class session, you will write a "daily question." The daily question is a short question or comment about the reading material for that class session, i.e., something you didn't understand, or found significant or noteworthy, or an omission of an important topic that you felt should be covered. The daily question should be posted on Moodle by **6 pm the day before each class**. We will try to address daily questions to the extent that it is possible during the class. Questions will be scored 1=poor (your question required very little reflection on the reading); 2=good (it's evident that you read the paper and put a moderate amount of thought into the question); 3=excellent (it's clear that you read the paper carefully and came up with an insightful question or comment about the topic).

### *Problem Set*

The first part of the course will cover material on "conservation economics" (the application of economics to conservation issues). The best way to really learn this material is to practice applying it by solving problems. The problem set will be due by 5 pm on February 18.

### *Draft Review Paper*

Objective:

1. The learner will write a review paper suitable for submission to a specific journal.

Select a journal and locate the author guidelines of that journal.

1. Please upload a document including your name, proposed title of your review paper, proposed journal, and proposed category to which you will submit the paper.
2. Submit a second document of the author guidelines for that journal. (You may have to create a pdf of the web page where the guidelines are posted. Some journals provide a downloadable document.)

Submit a draft of your review article.

Along with the review paper, please...

- 1) Identify the target journal and category.
- 2) Include a copy of the guidelines for authors for that journal and category.

3) Supply a list of three of your classmates who could serve as potential reviewers.

### ***Critique of Two Classmate's Review Papers***

Objective:

1. The learner will write an anonymous peer review critiquing the draft of a review paper written by a classmate.
2. The learner will write a signed peer review critiquing the draft of a review paper written by a different classmate.

Write a formal review of a manuscript. Follow the instructions provided reviewers for the journal *Conservation Biology* (below).

#### Conservation Biology Instructions to Reviewers

Thank you for agreeing to review the attached manuscript for Conservation Biology. We place a high premium on rapid and critical review of papers. Our expectation is that you will complete your review and return your comments to the Assigning Editor within three weeks of receipt. If you cannot do this, please inform the Assigning Editor immediately. We also expect all reviews to be returned to the Assigning Editor electronically, as a Word or Rich Text Format attachment to an email. Returning reviews as hard copies slows down the entire review process. If you would like to make comments directly on the manuscript you may use the "track changes" feature in Word, but note that this could reveal your identity to the authors.\*

The following criteria will help you evaluate manuscript suitability for publication and the nature and extent of revisions that may be required.

#### Relevance

Although we publish papers from disciplines as different as economics and ethics, our name accurately reflects our content. Please tell us if the manuscript bears no obvious relationship to the broadly defined field of conservation biology or if you would suggest a more appropriate journal to the author.

#### Importance

We receive far more manuscripts than we could possibly consider, many of which are of good scientific quality. Thus, there is great competition for journal space and our expectations of quality are high. Our research papers should have a significance or application that transcends the particular species, location, or system examined. Consequently, tell us if a paper is too narrow, parochial, or specialized to be of general interest. We also expect that our papers be novel and cutting edge, and not simply another competent study of well-known phenomena.

### Organization and Writing

Our readership is as diverse as our subject matter and includes research scientists from many fields, conservation managers, government officials, environmental activists, and others throughout the world. The writing, therefore, should contain as little technical jargon as possible, and specialized terms must be explained. The organization should be clear and tight, and the purpose and scope of the paper should be made plain in the opening paragraphs. Papers should be as concise as possible, with no unnecessary verbiage. Your criticisms will be most useful to the author if they are backed up by positive suggestions for reorganization, deletion of weak or unnecessary material, and addition or amplification of material that is not dealt with adequately.

### Tables and Figures

Tables and figures should not merely repeat material contained in the text. In general, the ratio of tables and figures (together) to total manuscript pages should not exceed 1:4. Please indicate for the author which tables and figures could be omitted or added. Concrete suggestions for improving illustrative material will be useful to the author.

### Justification and Bias

Are the conclusions objective and justified or do they merely reflect a preconceived bias? Are the literature citations reasonably complete, balanced, and up to date? Is the paper over referenced? (With the exception of comprehensive review papers, it is rarely necessary to include large reference strings to support a given point). Is the author fair to opposing points of view or alternative hypotheses? If not, please make specific recommendations for additions and changes.

### Length

Length is a major concern, and papers should not be any longer than absolutely necessary to convey their message. Word limits should generally be adhered to (research papers and Analytical Essays, 7,000 words; Reviews, 7,500 words; Research Notes, 3,000 words; Conservation in Practice, 5,000 words; Comments and Diversity, 2,000 words). We appreciate suggestions for condensing papers that are too long. We have many more good papers than we have space for and always want to cut unnecessary material.

### Stylistic Editing

Although much appreciated, detailed stylistic editing by reviewers is not necessary. This includes, for example, checking references against literature cited, and specific spelling changes. These are helpful, but if time is limited we prefer reviewers concentrate on substantive issues such as the quality of the science, statistical methods, hypotheses tested, conclusions reached, and relevance for our readers.

### Overall Judgment

General comments that judge the paper overall are very helpful to the Editors. Your review may contain confidential comments to the Editor, but these need to be clearly identified as such. It is here that you should make an overall recommendation regarding the fate of the manuscript; do not make such a recommendation where the authors will see it. If you feel the manuscript is poor and unlikely to be improved substantially by revision, please say so tactfully, but explicitly, in your review. The identity of reviewers is kept confidential; unless you choose to be identified, do not put your name or other identifying information on the review.

\*To hide your identity on your tracked changes in Word, go to “Tools,” then “Options,” then select “User Information.” A box will appear showing your name, initials, and address. You may change any information in those boxes to hide your identity. For example, under “Name” you might insert “anonymous” or just leave it blank. This will only apply to subsequent documents that you work on (i.e., do this before you use tracked changes).

### ***Revise Your Review Paper***

Objective:

The learner will revise a manuscript based on critiques from peer reviews and prepare it for submission to a specified journal.

Upload your review paper manuscript and cover letter to the editor here on Moodle!

### ***Create an Elevator Speech***

Objective:

The learner will craft an elevator speech that requests funding for his or her research.

In class, we will create, practice, and deliver individual elevator speeches describing your research and justifying a request for funding. This assignment will not be graded but will be presented to your peers for oral critique.

### ***Write an Opinion Piece***

Objective:

The learner will write an opinion piece concerning their area of research.

Write an op-ed piece on some facet of your research. Pick a target newspaper or website, identify it, write the piece to the expectations of that target. We will discuss this project extensively in class.

## **Classroom Conduct**

All students at the University have the right to a civil, productive, and stimulating learning environment. In turn, instructors have a responsibility to nurture and maintain such an environment. Students who disrupt the educational process because of discourteous, threatening, harassing, or other aggressive behavior either in class or online will be expelled. Please arrive on time and stay the entire class period (if you must arrive late or leave early, please sit near the door and try to enter or exit quietly).

- Turn off your cell phone before class begins.
- Please refrain from email or web-surfing activities during class.
- Avoid eating breakfast during class.

## **Absence and Late Policy:**

You are responsible for documenting the legitimacy of any absences; this includes:

- illnesses certified by Boynton Health Service or your family physician
- emergencies caused by a death or serious illness in your immediate family
- participation in intercollegiate athletic events or other University activities
- subpoenas, jury duty, military service, and religious observances

If you know that you will be absent when an assignment is due, please submit the assignment beforehand. To submit a late assignment without penalty, you must provide documentation of your absence. Otherwise late writing assignments will be subject to a 25% penalty provided they are submitted within 1 week of the scheduled due date; late assignments will not be accepted after 1 week except in the case of verified illness or family emergency.

**Academic Dishonesty and Plagiarism** The University of Minnesota's Student Conduct Code classifies scholastic dishonesty as a disciplinary offense actionable by the University. Scholastic dishonesty is defined as "Submission of false records of academic achievement; cheating on assignments or examinations; plagiarizing; altering, forging, or misusing a University academic record; taking, acquiring, or using test materials without faculty permission; acting alone or in cooperation with another to falsify records or to obtain dishonestly grades, honors, awards, or professional endorsement." Plagiarism is deliberately handing in another person's work as your own. It may be something you pulled off the internet, the work of a classmate, or that of another scientist whose work you read while researching a topic. It may be overt, in the form of copying answers from a colleagues' test, or it may be subtle, in the form of quoting or paraphrasing information from another source without properly acknowledging that source. If you want to use *the exact wording* from a published work, because you think it effectively makes a point, you must put the passage in quotation marks and cite the reference. More often, you will want to paraphrase another's ideas. Paraphrasing consists of expressing what an author is saying in your own words. In this case you should include reference to the author you paraphrase to indicate that the ideas are someone else's and not yours. If you are not clear about the differences between scholarly citation, collaboration and paraphrasing, please consult either instructor or see the resources available at <http://writing.umn.edu/tww/plagiarism/index.htm>. Evidence of academic dishonesty in any form will be forwarded to the Student Scholastic Conduct Committee.

According to University policy, academic dishonesty in any portion of academic work shall be grounds for awarding a grade of F or N for the entire course. Scholastic dishonesty is any act by a student that misrepresents the student's own academic work or that compromises the academic work of another. Examples include plagiarizing (the presentation of another's writing or ideas as

your own), cheating on assignments, and engaging in unauthorized collaboration on academic work. You can learn more about UMN policies on dishonesty at the Office for Student Academic Integrity: <http://www.osai.umn.edu/>

### **Student Mental Health and Stress Management**

As a student you may experience a range of issues that can cause barriers to learning, such as strained relationships, increased anxiety, alcohol/drug problems, feeling down, difficulty concentrating and/or lack of motivation. These mental health concerns or stressful events may lead to diminished academic performance or reduce a student's ability to participate in daily activities. University of Minnesota services are available to assist you with addressing these and other concerns you may be experiencing. You can learn more about the broad range of confidential mental health services available on campus via <http://www.mentalhealth.umn.edu/>.

### **Required Texts**

The readings for the course will be available on the course web site. Because of copyright and fair use restrictions, please do not distribute this to people who are not in our class. Additionally, you may want to consult the following book, when you need more background than is available in the readings.

Groom, M.J., G.K. Meffe, and C.R. Carrol. 2006. *Principles of Conservation Biology*, Third Edition. Sinauer Associates, Inc. 699 pp.

### **Web Page**

The web page for this course is maintained on moodle. You can log in through your My U Portal Toolkits webpage. Alternatively, you can fumble through the links at <https://moodle.umn.edu/>

### **Submitting Assignments**

All written assignments for this class are to be turned in via the Moodle page.

### **Readings**

#### ***Week 1:***

Tuesday, January 21 – Wicked problems: conservation in a complex world (Polasky)

Rittel, H.W.J. and M.M. Webber. 1984. Planning problems are wicked problems. In *Developments in Design Methodology*, Nigel Cross (ed.). John Wiley & Sons.

Thursday, January 23 – Economics and conservation (Polasky)

Roughgarden, J. 2001. Guide to diplomatic relations with economists. *Bulletin of the Ecological Society of America*. January 2001, 85-88.

Polasky, S. 2013. Conservation economics. In *Conservation Social Science: Understanding People and the Conservation of Biodiversity*, M. Maschia (ed.). Sections 1-2.



**Week 2:**

Tuesday, January 28 – Markets (Polasky)

Polasky, S. 2013. Conservation economics. In *Conservation Social Science: Understanding People and the Conservation of Biodiversity*, M. Maschia (ed.). Section 4.

Heal, G. 2001. Basic economics. In *Nature and the Marketplace: Capturing the Value of Ecosystem Services*. Island Press.

Thursday, January 30 –Market failure (Polasky)

Heal, G. 2001. Policies and institutions. In *Nature and the Marketplace: Capturing the Value of Ecosystem Services*. Island Press.

**Week 3:**

Tuesday February 4 – How do economists assess value (Polasky)

Polasky, S. 2013. Conservation economics. In *Conservation Social Science: Understanding People and the Conservation of Biodiversity*, M. Maschia (ed.). Section 3.

King, D., M. Mazzotta and K.Markowitz. Ecosystem valuation.  
<http://www.ecosystemvaluation.org/>

Heath, C. and D. Heath. 2010. Grow your people. In *Switch: How to Change Things when Change is Hard*. Random House.

Thursday February 6 – How do social scientists assess value: valuation, norms, and behaviors (David Fulton)

Teel, T.L. and Manfredo, M.J. 2010. Understanding the Diversity of Public Interests in Wildlife Conservation. *Conservation Biology* 24(1): 128-139.

Bruskotter, J. T. and D. C. Fulton. 2008. Minnesota anglers' fisheries-related value orientations and their stewardship of fish resources, *Human Dimensions of Wildlife* 13: 207–221.

For additional in depth reading:

Manfredo, M.J. 2008. *Who cares about wildlife? Social science concepts for exploring human-wildlife relationships and conservation issues*. Springer.

**Week 4:**

Tuesday, February 11 – The commons and governance of resource use (Polasky)

Dietz, T., E. Ostrom, and P.C. Stern. 2003. The struggle to govern the commons. *Science* 302: 1907-1912.

For additional in depth reading:

Ostrom, E. 2010. Beyond markets and states: Polycentric governance of complex economic systems. *American Economic Review* 100: 641-672.

Thursday, February 13 – Participatory processes (Kristen Nelson)

Rauschmayer, F. and H. Wittmer. 2006. Evaluating deliberative and analytical methods for the resolution of environmental conflicts. *Land Use Policy* 23:108-122.

Bingham, L. B., T. Nabachi, and R. O’Leary. 2005. The new governance: Practices and processes for stakeholder and citizen participation in the work of government. *Public Administration Review* 65(5): 547-558.

Berkes, F. 2009. Evolution of co-management: Role of knowledge generation, bridging organizations and social learning. *Journal of Environmental Management* 90: 1692-1702.

**Week 5:**

Tuesday, February 18 – Policy and politics (Kate Knuth)

Readings TBA

Thursday, February 20 – The Endangered Species Act (Blair)

Corn, M.L., K. Alexander, E.H. Buck. 2012. The Endangered Species Act: A primer. Congressional Research Service. RL31654 30 pp.

Schwartz, M.W. 2008. The performance of the Endangered Species Act. *Annual Review of Ecology, Evolution, and Systematics* 39: 279-99.

**Week 6:**

Tuesday, February 25 – ESA case study (Carl Tinsley)

Readings TBA

Thursday, February 27 – CBD and CITES (Polasky)

Ginsberg, J. 2002. CITES at 30 or 40. *Conservation Biology* 16(5): 1184-1191.

Vandegrift, J. 2013. Elephant poaching: CITES failure to combat the growth in Chinese demand for Ivory. *Virginia Environmental Law Journal* 31: 102-135.

Wasser, S.K., B. Clark, and C. Laurie. 2009. The ivory trail. *Scientific American* 301: 68-76.

**Week 7:**

Tuesday, March 4 – Conservation and development (Polasky)

Barrett, C.B., K. Brandon, C. Gibson and H. Gjertsen. 2001. Conserving biodiversity amid weak institutions. *Bioscience* 51(6): 497-502.

Adams, W.H., R. Aveling, D. Brockington, B. Dickson, J. Elliot, J. Hutton, D. Roe, B. Vira and W. Wolmer. 2004. Biodiversity conservation and the eradication of poverty. *Science* 306: 1146-1149.

Thursday, March 6 – Sustainability (Polasky)

Arrow, K. et al. 1995. Economic growth, carrying capacity, and the environment. *Science* 268: 520-521.

Callicott, J.B. and K Mumford. 1997. Ecological sustainability as a conservation concept. *Conservation Biology* 11(1): 32-40.

Arrow, K. et al. 2004. Are we consuming too much? *Journal of Economic Perspectives* 18(3): 147-172. {Read pp. 147-159}

**Week 8:**

Tuesday, March 11 – Population, agriculture, and land use (Polasky)

Cohen, J.E. 2003. Human population: the next half -century. *Science* 302: 1172-1175.

Foley, J. et al. 2005. Global consequences of land use change. *Science* 309: 570-574.

Foley, J. et al. 2011. Solutions for a cultivated planet. *Nature* 420: 337-342.

Thursday, March 13 – Are we on a sustainable path? (Polasky)

Kates, R.W. and T.M. Parris. 2003. Long-term trends and a sustainability transition. *Proceedings of the National Academy of Sciences* 100(14): 8062-8067.

Tierney, J. 1990. Betting the planet. *The New York Times Magazine*, December 2, 1990.

Rockstrom, J. et al. 2009. A safe operating space for humanity. *Nature* 461: 472-475.

**Spring Break****Week 9:**

Tuesday, March 25 – Introduction to marine fisheries (Peter Sorenson)

Hutchings, J.A., and Rangel. 2011. Correlates of recovery for the Canadian Atlantic cod (*Gadus morhua*). *Canadian Journal of Zoology* 89: 386-400.

Seelye, K.Q. and J. Bidgood. 2013. Officials back deep cuts in Atlantic cod harvest to save industry. *New York Times* 30 January 2013.  
[http://www.nytimes.com/2013/01/31/us/officials-back-deep-cuts-in-atlantic-cod-harvest-to-save-industry.html?\\_r=0](http://www.nytimes.com/2013/01/31/us/officials-back-deep-cuts-in-atlantic-cod-harvest-to-save-industry.html?_r=0)

Thursday, March 27 – Bioeconomic models of harvest (Polasky)

Clark, C. 1990. Elementary dynamics of exploited populations. Chapter 1 in *Mathematical Bioeconomics*. Wiley Inter-Science.

Clark, C. 1990. Economic models of renewable-resource harvesting. Chapter 2 in *Mathematical Bioeconomics*. Wiley Inter-Science.

Polasky, S. 2014. Additional notes on optimal harvesting.

**Week 10:**

Tuesday, April 1 – Modeling exploited fisheries (Paul Venturelli)

Larkin, P.A., 1977. An epitaph for the concept of maximum sustained yield. *Transactions of the American Fisheries Society* 106(1): 1-11.

Thursday, April 3 – Marine protected areas (Ray Newman)

Cressey, N. 2011. Uncertain sanctuary. *Nature* 480: 166-167.

Lester, S.E., B.S. Halpern, K. Grorud-Colvert, J. Lubchenco, B. I. Ruttenberg, S.D. Gaines, S. Aíramé, and R.R. Warner. 2009. Biological effects within no-take marine reserves: A global synthesis. *Marine Ecology Progress Series* 384: 33–46.

For those of you who want to pursue this topic more in depth, please read.

McCook, L. J., Ayling, T., Cappo, M., Choat, J. H., Evans, R. D., De Freitas, D. M., ... & Williamson, D. H. (2010). Adaptive management of the Great Barrier Reef: A globally significant demonstration of the benefits of networks of marine reserves. *Proceedings of the National Academy of Sciences*, 107(43), 18278-18285.

**Week 11:**

Tuesday, April 8 – Overfishing / Carp Control (Burgess and Sorenson)

Burgess, M. G.; Polasky, S.; Tilman, D. 2013. Predicting overfishing and extinction threats in multi species fisheries. *Proceedings of the National Academy of Sciences* 110 (40): 15943-15948.

Thursday, April 10 – Aquatic invasive species (Newman)

Lodge, D.M. 1993. Biological invasions: Lessons for ecology. *Trends in Ecology and Evolution* 8(4): 133-137.

Strayer, D. L. (2010). Alien species in fresh waters: ecological effects, interactions with other stressors, and prospects for the future. *Freshwater Biology*, 55(s1), 152-174.

Davis, M. et al. 2011. Don't judge species by their origins. *Nature* 474: 153-154.

**Week 12:**

Tuesday, April 15 – Land use and streams (Newman)

Allan, J.D. 2004. Landscapes and riverscapes: The influence of land use on stream ecosystems. *Annual Review of Ecology, Evolution, and Systematics* 35: 257-284.

Thursday, April 17 – Communication on controversial topics: Gray Wolves (Strauss)

Strauss, A. ed. 2006. Gray Wolves, Gray Matter: Exploring the Social and Biological Issues of Wolf Survival. International Wolf Center: Ely, Minnesota. (Browse this resource quickly)

**Week 13:**

Tuesday, April 22 – Basics of communication: developing a theme (Blair)

Blair, R.B. et al. 2011. Chapter 5: What did you say? Communicating your message in Big Woods, Big Rivers: An Introduction to the Natural History of Minnesota's Deciduous Forest. University of Minnesota Extension Service: Saint Paul, MN. Pp 133 – 164.

Thursday, April 24 – Communicating with non-scientists: the elevator speech (Blair)

McGovern, V. 2009. Career Advice: The One-Minute Talk. *Science Careers*.  
[http://sciencecareers.sciencemag.org/career\\_magazine/previous\\_issues/articles/2009\\_03\\_13/caredit.a0900034](http://sciencecareers.sciencemag.org/career_magazine/previous_issues/articles/2009_03_13/caredit.a0900034)

**Week 14:**

Tuesday, April 29 – Communicating with non-scientists: the opinion piece (Blair)

Hayes, R. Sound Science Initiative: Tips and Tools. Union of Concerned Scientists: Cambridge, Massachusetts. <http://www.ucsusa.org/ssi/resources/> Read all links offered on this page. Follow the instructions on writing an opinion piece in writing your opinion piece.

Thursday, May 1 – Group presentation

**Week 15:**

Tuesday, May 6 – Group presentation

Thursday, May 8 – Life after graduation: Panel of conservation professionals

Blickley, J.L., K. Deiner, K. Garbach, I. Lacher, M.H. Meek, L.M. Porensky, M.L. Wilkerson, E.M. Winford, and M.W. Schwartz. 2012. Graduate student's guide to necessary skills for nonacademic conservation careers. *Conservation Biology*. 27(1):24-34.

Date	Lectures	Instructor	Readings	Deadlines
Jan. 21	Wicked problems	Polasky	Moodle	
Jan. 23	Economics and conservation	Polasky	Moodle	
Jan. 28	Markets and market failure I	Polasky	Moodle	
Jan. 30	Markets and market failure II	Polasky	Moodle	
Feb. 4	Economists & assessing value	Polasky	Moodle	Journal selection
Feb. 6	Social scientists & assessing value	Fulton	Moodle	
Feb. 11	The commons & resource use	Polasky	Moodle	
Feb. 13	Participatory processes	Nelson	Moodle	
Feb. 18	Policy and politics	Knuth	Moodle	Problem set due
Feb. 20	Endangered Species Act	Blair	Moodle	
Feb. 25	ESA Case Study	Tinsley	Moodle	
Feb. 27	CITES	Polasky	Moodle	Review paper draft due
Mar. 4	Conservation and development	Polasky	Moodle	
Mar. 6	Sustainability	Polasky	Moodle	
Mar. 11	Population, food and land use	Polasky	Moodle	
Mar. 13	Are current trends sustainable?	Polasky	Moodle	
Spring Break!				
Mar. 25	Bioeconomic models	Polasky	Moodle	
Mar. 27	Introduction to marine fisheries	Sorenson	Moodle	Peer reviews due
Apr. 1	Modeling exploited fisheries	Venturelli	Moodle	
Apr. 3	Marine protected areas	Newman	Moodle	
Apr. 8	Overfishing & Invasive Species	Burgess & S	Moodle	
Apr. 10	Aquatic Invasive Species	Newman	Moodle	
Apr. 15	Land-use and streams	Newman	Moodle	Take-home exam due
Apr. 17	Communication	Strauss	Moodle	
Apr. 22	Communication	Blair	Moodle	
Apr. 24	Communication	Blair	Moodle	
Apr. 29	Communication	Blair	Moodle	
May 1	Group presentation		Moodle	Review paper due
May 6	Group presentation		Moodle	
May 8	Professional panel	Guests		Editorial page opinion