

SEMESTER AT SEA COURSE SYLLABUS  
University of Virginia, Academic Sponsor

**Voyage: Spring 2016**  
**Discipline: Biology**  
**BIOL 3559 101: Conservation Biology**  
**Division: Upper**  
**Faculty Name: Dr. Catherine Pringle**  
**Credit Hours: 3; Contact Hours: 38**

**Pre-requisites:**

General biology or environmental science recommended but not absolutely necessary. This course is appropriate for undergraduate students from multiple disciplines, including ecology, biology, environmental science, anthropology, natural resources, science education, and journalism – among other disciplines. *An interdisciplinary mix of students is desired and makes for a more stimulating class environment.*

**COURSE DESCRIPTION**

This upper-level undergraduate course will review the drivers of global environmental change (human population growth and consumption of resources), resulting environmental degradation, and tools to slow down or address environmental damage. The course begins with analyses of current and historic changes in biodiversity, focusing on environmental challenges such as habitat conversion and fragmentation, exotic species, disease, climate change, and toxic chemicals. Species, landscape, and ecosystem approaches to conservation are reviewed, including important tools such as management of source-sink dynamics, conservation genetics, population viability analysis, elements of nature reserve design, restoration, and environmental policy. The course uses case studies from the instructor's own experiences in conservation research and management. Connections are explored between biodiversity and human health in a changing global environment. Special attention is paid to current conservation issues in countries and regions along the route of the voyage.

**COURSE OBJECTIVES**

General Goal: To provide students with a fundamental understanding of the ecological and evolutionary dimensions of conservation biology, along with science-based management and policy solutions. The course will combine lectures, readings, in-class presentations and exercises with a special emphasis on critical thinking, problem solving, and global understanding.

Specifics: By the end of this course students should be able to:

- understand ecological and evolutionary principles that underlie biological diversity;
- explain threats to biodiversity and consequences of biodiversity loss and to identify

linkages among conservation challenges across different biological scales (genes to landscapes) and geographical scales (local to global);

- demonstrate how ecological and evolutionary principles are applied to solving conservation challenges;
- articulate our responsibility, as humans, to serve as global land stewards;
- apply critical reasoning skills to assessment, analysis, and synthesis of conservation problems and solutions; and
- demonstrate a greater understanding of: conservation issues in countries both outside and within the US; cultural differences in perceptions of problems; and effective solutions.

## **REQUIRED TEXTBOOKS**

AUTHOR: Richard B. Primack  
TITLE: Essentials of Conservation Biology  
PUBLISHER: Sinauer Associates, Inc.  
ISBN #: 978-1-60535-293-3  
DATE/EDITION: 2014/ Sixth Edition

## **TOPICAL OUTLINE OF COURSE**

Depart Ensenada- January 5:

### **A1- January 7: Introductions; *What is Conservation Biology and Sustainable Development?***

Readings: Primack Chapter 1

### **A2- January 9: *Global Biodiversity and why it is important: Historic and Contemporary losses and patterns***

Readings: Primack Chapters 2, 3, 7, 8

Recommended: Kolbert Chapters 1-5

### **A3- January 11: *Current Threats to Biodiversity***

Readings: -Primack Chapters 7, 8,

Honolulu: January 12

### **A4- January 14: *Conservation Ethics and Environmental Justice in the Age of Globalization***

Readings: Primack Chapters 6, 20, 22

DVD:

### **A5- January 17: *Ecosystem Services and the Economics of Conservation***

Readings: Primack Chapters 4,5

Study Day: January 19

**A6- January 20: *Habitat Fragmentation***

Readings: Primack ,Chapter 9  
Crooks and Sanjayan, Chapter 10

**A7- January 22: *Overexploitation with emphasis on “Fishing Down Marine Foodwebs (60 min); Preview of Conservation Issues in Japan (20 min)***

Readings: Primack, Chapter 10 (217-226)

Yokohama: January 24-25

In-Transit: January 26

Kobe: January 27-28

**A8- January 29: Student Presentations/Discussion – Reflections on Japan (60 min); *Preview of Conservation Issues in China (20 min)***

Shanghai: January 31-February 1

In-Transit: February 2-3

Hong Kong: 4-5

**A9- February 6: Student Presentations/Discussion – Reflections on China and cross-country comparisons (60 min); *Preview of Conservation Issues in Viet Nam (20 min)***

Ho Chi Minh: February 8-12

**A10- February 13: Student Presentations/Discussion – Reflections on Viet Nam and cross-country comparisons (60 min); *Preview of Conservation Issues in Burma (20 min)***

Study Day: February 15

**A11-February 16: *Exotic Species in the Age of the Homogocene***

Readings: Primack Chapter 10 (pp 227-236)

Yangon: February 18-22

**A12- February 23: *Conservation at population and species levels***

Readings: Primack Chapter 11, 12, 13, 14

**A13- February 25: Midterm Exam**

Cochin: February 27-March 3

**A14- March 4: Student Presentations/Discussion – Reflections on India and Cross-Country Comparisons**

Study Day: March 6

**A15- March 7: *Ecosystem-level management of Protected Areas***

- Readings: -Primack Chapters 15, 16,  
-Pringle, C. M. 2001. Hydrologic connectivity and the management of biological reserves: A global perspective. *Ecological Applications* 11: 981-998.  
-Pringle, C. M. 2000. Threats to U.S. public lands from cumulative hydrologic alterations outside of their boundaries. *Ecological Applications* 10:971-989.

Port Louis: March 9

**A16- March 10: *When Protected Areas Become Population Sinks: Examples from the U.S., Viet Nam, India and Africa***

Study Day: March 12

**A17- March 13: *Park Management Case study: Kruger National Park, South Africa***

- Readings:- Primack Chapters 17, 18;  
-Licht, D.S., R. Slotow, and J. Millsaugh. 2008. Out of Africa: Lessons from Park Management in South Africa. *The George Wright Forum*: 25(1): 20-29.

Cape Town: March 15-20

**A18- March 21: Student Presentations/Discussion – Reflections on South Africa and Cross-Country Comparisons**

**A19- March 23: *Ecological Restoration and Conservation at local, national and international levels***

- Readings: Primack Chapter 19, 20, 21

**A20- March 25: *Conservation Challenge I: Dealing with Emerging Infectious Diseases (60 min); Conservation issues in Ghana (20 min)***

- Readings: Primack Chapter 10 (pp 241- 246)

Takoradi: March 27-28

Tema: March 29-31

**A21- April 1: Student Presentations/Discussion – Reflections on Ghana and Cross-Country Comparisons**

**A22- April 3: *Conservation Challenge II: Controlling Synthetic Chemicals in the Environment***

- Readings: Colburn et al. xxxx, Chapters  
DVD: *Homo toxicus*

**A23- April 5: *Conservation Challenge III: Mitigating effects of Global Climate Change (60***

**min) and *Preview of Conservation Issues in Morocco (20 min)***  
Readings: Primack Chapter 9 (pp 205-212)

Casablanca: April 7-11

Study Day: April 12

### **A24- A Day Finals, April 13**

April 16: Disembarkation Day

### **FIELD WORK**

Experiential course work on Semester at Sea is comprised of the required field lab led by your instructor and additional field assignments that span multiple ports.

*Prior to visiting each new port, Catherine Pringle will present a 20 minute introduction (in class) to conservation issues confronting that country. She would be happy to present these summaries outside of class as well, in a setting suitable for anyone on the ship who is interested in attending.*

**FIELD LAB** (At least 20 percent of the contact hours for each course, to be led by the instructor.)

Country: Honoulu, Hawaii

Idea: Coconut Island is a tropical marine research facility belonging to the University of Hawai'i at Manoa's Institute of Marine Biology. It is surrounded by 64 acres of coral reef and it supports research in many disciplines of tropical science such as coral ecology, biogeochemistry, and evolutionary genetics. Students will travel on the station's research vessel, deploying a plankton net along the way. Upon reaching Coconut Island they will encounter sharks and other research animals, then do two hands-on labs, one analyzing the plankton from the research cruise and the other sorting through invasive seaweeds to separate out and recover small creatures from the bay. The lab will provide first-hand exposure to the endangered coral ecosystem, and an appreciation of the role that scientific research plays in their conservation.

Objectives:

1. Understand the structure and biodiversity of coral reef ecosystems, and discuss the threats to their survival.
2. Tour a tropical marine research facility; speak with scientists engaged in marine research; and gain hands-on experience in data collection.
3. Develop an appreciation of the linkages between basic scientific research and applied conservation strategies.

### **FIELD ASSIGNMENTS**

- Students will write a two-page response (following the Field Lab) to specific questions posed by the instructor. Questions will require students to interpret and evaluate what they see, not just summarize.
- In three ports-of-call, students will be required to submit an independent field assignment: “Essay/Photos from the Field” an independent field assignment, consisting of a conservation essay (1-2 pages) and 5-10 related images. The essay and images must relate to a conservation theme discussed in the course. These will be shared with the rest of the class on discussion days.

## **METHODS OF EVALUATION / GRADING RUBRIC**

The final grade in the course will be computed as follows:

- 25% midterm examination
- 25% final examination
- 20% field lab
- 30% class presentations and participation in class discussions

## **RESERVE BOOKS AND FILMS FOR THE LIBRARY**

1. AUTHOR: Meffe, Groom and Carroll

TITLE: Principles of Conservation Biology 3<sup>rd</sup> Edition

PUBLISHER: Sinauer Associates

ISBN #: 978-0-87893-597-0

DATE/EDITION: 2006/3<sup>rd</sup> Edition

2. AUTHOR: Elizabeth Kolbert

TITLE: The Sixth Extinction: An unnatural history

PUBLISHER: Henry Holt and Company

ISBN #: 978-0-8050-9299-8

3. AUTHOR: Theodore Colburn, Dianne Dumanoski, John Peterson Myers

TITLE: Our Stolen Future

PUBLISHER: Dutton Publishers

ISBN #: 0-452-27414-1

DATE/EDITION: 1997

4. AUTHOR: Reuben P. Keller

TITLE: Invasive species in a globalized world

PUBLISHER: University of Chicago Press

ISBN #: 13-978-0-226-16618-6

DATE/EDITION: 2015

5. AUTHOR: Reuben P. Keller

TITLE: Invasive species in a globalized world

PUBLISHER: University of Chicago Press

ISBN #: 13-978-0-226-16618-6

DATE/EDITION: 2015

6. AUTHOR: Paul. Krausman and Bruce Leopold  
TITLE: Essential Readings in Wildlife Management and Conservation  
PUBLISHER: John Hopkins University Press  
DATE/EDITION: 2013

7. AUTHOR: K. Crooks and M. Sanjayan  
TITLE: Connectivity Conservation  
PUBLISHER: Cambridge University Press  
DATE/EDITION: 2006

8. DVD: Homo Toxicus

## **ELECTRONIC COURSE MATERIALS**

Crooks, K., and M. Sanjayan. 2006. Connectivity Conservation. Cambridge Univ. Press. (chapter 10).

Kolbert, E. 2014. The Sixth Extinction: An unnatural history. Henry Holt and Co. (chapters 1-5).

Licht, D.S., R. Slotow, and J. Millspaugh. 2008. Out of Africa: Lessons from Park Management in South Africa. The George Wright Forum: 25(1): 20-29.

Pringle, C. M. 2000. Threats to U.S. public lands from cumulative hydrologic alterations outside of their boundaries. *Ecological Applications* 10:971-989.

Pringle, C. M. 2001. Hydrologic connectivity and the management of biological reserves: A global perspective. *Ecological Applications* 11: 981-998.

## **ADDITIONAL RESOURCES**

Students will be asked to locate some information on the Internet.

## **HONOR CODE**

Semester at Sea students enroll in an academic program administered by the University of Virginia, and thus bind themselves to the University's honor code. The code prohibits all acts of lying, cheating, and stealing. Please consult the Voyager's Handbook for further explanation of what constitutes an honor offense.

Each written assignment for this course must be pledged by the student as follows: "On my honor as a student, I pledge that I have neither given nor received aid on this assignment." The pledge must be signed, or, in the case of an electronic file, signed "[signed]."