THE SCHOOL FOR FIELD STUDIES

Conservation Science and Practice
SFS 3800

Syllabus, Fall 2016

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The School for Field Studies (SFS)
Center for Andes-Amazon Studies (CAS)
Pilcopata, Peru

Course Overview

The overarching goal of this course is to make students aware of the enormous responsibility humans have as stewards of the natural environment, and to provide them with the concepts, tools, and incentives to affect conservation of the natural environment. Dramatic changes are occurring in almost every corner of the world; many of which are a result of anthropogenic disturbances. Human activities are changing atmospheric gases and contributing to climate change. Humans are overexploiting natural resources, polluting ecosystems, introducing exotic species into ecosystems, and causing habitat destruction at such a high rate that many scientists think that we have entered the sixth mass extinction of life on Earth. The fate of millions of species is dependent on actions that we take in the next few decades.

The field of conservation is focused on understanding the effect that human beings have on nature and proposing alternatives and solutions in order to protect biological diversity, including ecosystems, species, and genetic diversity. Conservation promotes processes, both ecological and social, that support biodiversity. Being by nature an interdisciplinary field, where concepts and research in ecology, environmental science, taxonomy, genetics, and evolution inform the practical applications of social, economic, and behavioral sciences, conservation is also as much about managing biodiversity as it is about managing people.

The focus of the course is based largely on field exercises and laboratories which build on five core themes that will be covered in a series of lectures, videos, and readings:

1. Biodiversity - distribution, value, and measurement
2. Threats to biodiversity
3. Philosophy, tools, and applications
4. Peruvian conservation
5. Global conservation projects

The course will expose students to broad issues that face the entire planet and focus on conservation strategies in the region. The Andean - Amazon interface and its associated ecosystems will provide the local lens to evaluate global conservation.

Learning Objectives

Students will draw on observations and evidence to make decisions about the efficacy of conservation practices. Students will be able to:

1. Relate the major principles of ecology and evolution in conceptualizing and practically applying the science of conservation biology
2. Identify the current questions being addressed by conservation research in both global and local perspectives
3. Define the major threats to biological diversity and identify both direct and indirect drivers of the threats
4. Use planning tools to design conservation strategies and plans aimed at protecting and supporting biodiversity, as well as promoting the social processes that enable these strategies
5. Identify the current political and economic concerns of conservation, the actors involved, and their roles and methods in policy formation
6. Employ field research methods and analytical tools, including qualitative and quantitative methods, that make up part of a practicing conservationists' tool kit

Assessments

Assessment Item	Value (%)
Field Exercises (full report)	
– Primate assessment at Villa Carmen and Manu Wildlife Center	10
– Avian species richness estimate (Mantanay)	10
Field Laboratory (results only)	
– Avian playback experiments - Villa Carmen	10
– Night monkey vocal analysis	10
– Night monkey parasitology	10
– Camera trap analysis	5
Written Questions and Participation	15
– Llama pack project – Pilco Grande – Tierra Linda butterfly project	
Quizzes - Readings	15
Final Exam	15
TOTAL	100

Assessment Descriptions

A grading rubric will be provided for each assignment.

Field Exercises. Two field exercises will be conducted throughout the semester. These assignments should be no more than 5 pages (single space, not including bibliography, tables, or figures). The exercise itself will be done in groups; however, the report should be your own original work.
1) Avian playback experiments - calculate density estimates of bird species in the area
2) Primate conservation assessment - look at the relationship of ecological disturbance and primate species richness at Manu Wildlife Center

Field Laboratories. Four field laboratories will simply require submitting the group data and any required analysis (e.g., identification of parasites or animals). The key is that the field research methods must be followed meticulously and your grade will depend on your attention to detail and completeness of data collection.
1) Avian playback experiment - Villa Carmen
2) Night monkey vocal analysis
3) Night monkey parasitology
4) Camera trap analysis

Written Questions and Participation. 3-5 detailed and well-thought questions need to be submitted by 5pm the day before the field excursion. These questions can then be asked during the actual field class. Your participation and interaction with community and project members is an important part of the course.

Quizzes. Quizzes will be done outside of the classroom and turned in at the beginning of class. The quizzes will be focused on video lectures and readings, preparing students for in-class discussions. The quizzes will consist of one or two short essay questions. These types of questions will be similar to those found on the final exam.

Final Exam. One final exam which includes short answer and essay questions similar to quiz format.

Grading Written Assignments

All assignments should be written and/or presented in grammatically correct English, using proper sentences, paragraphs, punctuation, etc. Writing should be succinct. An incoherent narrative will be considered an expression of faulty scientific reasoning. The evaluation of written work is holistic, with quality levels and criteria as stated below. Numbers are listed in parentheses beside each quality level, based on a grading scale of 100 points. A more-detailed grading rubric will be supplied in class.

Exceptional (95 to 100 points). The work goes well beyond the task assigned. It is impressive, unusually complete, and imaginative. Excellent use is made of the reference material cited within the paper or of examples cited. The scientific conclusions are clearly supported by data presented and there is evidence of originality in analysis. Reference material shows excellence with respect to both breadth and depth. Only outstanding submissions will be designated as Exceptional.

Strong (85 to 95 points). The work fully engages the major scientific principles embodied in the topic. Data are good and/ or well-chosen to convey information. The scientific analysis makes good use of the data presented. The writing demonstrates a clear understanding of the fundamental issues of the topic being explored. Reference material is appropriate for the topic being discussed.

Respectable (75 to 84 points). A sensible approach to addressing the issues contained in the topic being explored is shown. The writing engages most of the appropriate scientific issues and principles. Some problems are evident: the choice of data or examples is correct, but incomplete; the scientific analysis, though generally correct, shows gaps; pertinent information may be missing. These omissions do not seriously hinder the usefulness of the work. Reference material is good but incomplete.

Marginal (70 to 74 points). The work partially engages the major scientific principles embodied in the topic being explored. The work generally relates to the assigned task, but gaps and problems are prominent and interfere with its effectiveness. Data or examples are poorly chosen and do not contribute substantially to the scientific analysis. The analysis has serious gaps. Reference material is shallow or only marginally appropriate.

Weak (60-69 points). The work shows little depth. The effort is spotty with only fragmentary evidence of understanding the data, examples, and reference material in reporting on the subject. The analysis is grossly incomplete, and reference material is absent or inappropriate. Minimal (less than 60 points). There is little or no meaningful effort in evidence. The approach taken is devoid of knowledge of the principles embodied in the topic being explored. Analysis is absent or shallow. No appropriate references are cited.

Grading Scheme

A	95.00 – 100.00%	B+	86.00 – 89.99%	C+	76.00 – 79.99%	D	60.00 – 69.99%
A-	90.00 – 94.99%	B	83.00 – 85.99%	C	73.00 – 75.99%	F	0.00 – 59.99%
		B-	80.00 – 82.99%	C-	70.00 - 72.99%		

General Reminders

Readings and Lecture Videos - You are expected to have read any required articles and textbook readings prior to each class, as well as listen and watch all lecture videos. In order to encourage reading and watching lecture videos before coming to class or going to the field, the quizzes will reference readings and lecture videos for that particular day. All readings and lecture videos will be given to each student at the beginning of the semester.

Plagiarism - Using the ideas and material of others without giving due credit, is cheating and will not be tolerated. A grade of zero will be assigned if anyone is caught cheating or aiding another person to cheat actively or passively (e.g., allowing someone to look at your exam). All assignments unless specifically stated should be individual pieces of work.

Deadlines

Deadlines for written and oral assignments are stated for several reasons: they are a part of working life to which students need to become accustomed and promote equity among students, and deadlines allow faculty time to review and return assignments before others are due. Assignments will be handed back to students after a one-week grading period. Late assignments will incur a 10% penalty for each day that they are late. No assignment will be accepted after three days.

Participation

Since we offer a program that is likely more intensive than you might be used to at your home institution, missing even one lecture can have a proportionally greater effect on your final grade simply because there is little room to make up for lost time. Participation in all components of the program is mandatory because your actions can significantly affect the experience you and your classmates have while at SFS. Therefore, it is important that you are *prompt for all activities*, bring the necessary equipment for field exercises and directed research, and simply get involved.

Course Content

*In-class Lecture (L); Field Lecture (FL); Field Exercise (FEX); Laboratory Exercise (FLAB)

Code	*Tentative Date*	*Contact Hrs*	*Type*	*Lecture Title*	*Required Readings*	*Lecture Videos*	*Assignments Due /Quizzes*
CS1	9/5/16	3	L	Biodiversity: distribution and function	Hunter 2009 (Ch 1); Mora 2011; Keeping Wild (pg. 3-15)	1. Biodiversity 2. How many species? 3. Camelid	Quiz Due at Beginning of Lecture
CS2	9/8/16	2.5	L	Value of biodiversity	Hunter 2009 (Ch 3); Keeping Wild (pg. 31-54)	4.Value biodiversity	Quiz Due at Beginning of Lecture
CS3	9/9/16	4	FL	Llama pack excursion	Hunter 2009 (Ch 6 & 9); Chatam 2015; Hunter 2009 (Ch 7)	5. Extinctions 6. Global threats	Written Questions Due Before Class
CS4	9/11/16	4	FEX	Mantanay avian species richness estimates			
CS5	9/17/16	4	FL	Pilco Grande	Hunter 2009 (Ch 12)		Written Questions Due Before FL
	9/18/15						Avian FEX Due
CS6	9/22/16	2.5	FEX	Primate Assessment - Villa Carmen	Chapman 2001	7. Primates	
CS7	9/22/16	2	FEX	Primate Assessment - Villa Carmen			
CS8	9/26/16	3.5	FLAB	Avian playback			
	9/27/16						Avian FLAB Results Due
CS9	9/27/16	2.5	L	Primate vocalization	Keeping Wild (pg. 66-80 and 114-125)	8. PVA	Quiz Due At Beginning of Class
CS10	9/27/16	1.5	FLAB	Primate vocalization		9. Tierra Linda	
CS11	10/1/16	4	FL	Tierra Linda			Written Questions Due Before FL

Code	*Tentative Date*	*Contact Hrs*	*Type*	*Lecture Title*	*Required Readings*	*Lecture Videos*	*Assignments Due /Quizzes*
CS12	10/1/16	3	L	Primate vocalization analysis	Frankham 2010; Edwards 2013; Podcast -Galapagos	10. Conservation genetics 11. Small populations	
	10/2/16						Primate FLAB Results Due
CS13	10/4/16	2	FL	Camera Trap			
CS14	10/4/16	1	L	Parasitology and Conservation			
CS15	10/4-10/6	1.5	FLAB	Night monkey parasitology			
CS16	10/7/16	5	FLAB	Night monkey parasitology - Laboratory			
	10/8/16						Primate Parasite FLAB Due
CS17	10/10/16	1	L	Primate Assessment Prep			
CS18	10/13/16	3	FEX	Primate Assessment - Manu	Levi 2009		
CS19	10/14/16	2	FEX	Primate Assessment - Manu (habitat)			
CS20	10/14/16	1	L	Primate Assessment - Analysis			
CS21	10/18/16	2	FLAB	Camera trap retrieval and analysis	Hajek 2011; Woolf 2010	12. NGOs and Conservation successes 13. Biochar 14. ESA	Camera Trap Results Due Primate Assessment FEX Due
CS22	10/24/16	2	L	Conservation Successes	Rosenthal 2012; Keeping Wild (pg. 137-173)	15. REDD+ 16. Carbon credits	
CS23	10/28/16	1	L	Review			
CS24	10/29/16			Final exam			
		58.0		**TOTAL CONTACT HOURS**			

**Note that this is a tentative schedule and may change due to any number of unexpected circumstances.

Course Bibliography

Primary Readings

Chapman, C. and C. Peres (2001). Primate conservation in the new millennium: the role of scientists. Evolutionary anthropology 10: 16-33.

Chatham House Report: Changing Climate, Changing Diets: Pathways to Lower Meat Consumption.

Edwards, D. L. et al. (2013). The genetic legacy of Lonesome George survives: Giant tortoises with Pinta Island ancestry identified in Galapagos. Biological Conservation 157: 225-228.

Frankham, R. (2010). Challenges and opportunities of genetic approaches to biological conservation. Biological Conservation 143: 1919-1927.

Hajek, F., Ventresca, M., Scriven, J., and Castro, A. (2011). Regime-building for REDD+: Evidence from a cluster of local initiatives in south-eastern Peru. Environmental Science & Policy 14: 201-215.

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Mora, C., Tittensor, D., Adl, S., Simpson, A., and Worm, B. (2011). How many species are there on Earth and in the ocean? PLOS Biology 9: 1-8.

Rosenthal, A., Stutzman, H., and Forsyth, A. (2012). Creating mosaic-based conservation corridors to respond to major threats in the Amazon headwaters. Ecological Restoration 30: 296-299.

Sodhi, N. and Erlich, P. (2010) Conservation Biology for All, Oxford University Press, Oxford.

Woolf, D., Amonette, J., Street-Perrott, F., Lehmann, J., and Joseph, S. (2010). Sustainable biochar to mitigate global climate change. Nature communications 1: 1-7.

Supplementary Readings

Chan, K., Pringle, R. M., Ranganathan, J. A. I., et al. (2007). When agendas collide: Human welfare and biological conservation. Conservation biology 21: 59-68.

Gebremedhin, B., et al. (2009). Combining genetic and ecological data to assess the conservation status of the endangered Ethiopian walia ibex. Animal Conservation 12: 89-100.

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Kareiva, P. (2014) New Conservation: Setting the Record Straight and Finding Common Ground. *Conservation Biology* 28: 634-636.

Kirkby, C., Giudice, R., Day, B., Turner, K., Soares-Filho, B., Oliveira-Rodrigues, H., and Yu, D. (2011). Closing the ecotourism-conservation loop in the Peruvian Amazon. Environmental Conservation, 38: 6-17.

Kloor, K. (2015). The Battle for the Soul of Conservation Science. Issues in Science and Technology 31: 74.

Lafferty, K. (2009). The ecology of climate change and infectious diseases. Ecology 90: 888-900.

Lindenmayer, D., Franklin, J., and Fischer, J. (2006). General management principles and a checklist of strategies to guide forest biodiversity conservation. Biological Conservation 131: 433-445.

Rands, M. et al. (2010). Biodiversity conservation: challenges beyond 2010. Science 329: 1298-1303.

Salafsky, N. (2010) Integrating development with conservation: A means to a conservation end, or a mean end to conservation? *Biological Conservation* 144: 973-978.

Sarno, Ronald J., David E. Jennings, and William L. Franklin. (2015). Estimating effective population size of guanacos in Patagonia: an integrative approach for wildlife conservation. Conservation Genetics 16: 1167-1180.

Shanee, N., Shanee, S., and Horwich, R. (2014). Effectiveness of locally run conservation initiatives in north-east Peru. Oryx 1-9.

Shepard Jr, G., Rummenhoeller, K., Ohl-Schacherer, J., and Yu, D. (2010). Trouble in paradise: Indigenous populations, anthropological policies, and biodiversity conservation in Manu National Park, Peru. Journal of Sustainable Forestry 29: 252-301.

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