



THE SCHOOL
FOR FIELD STUDIES

Conservation Science and Practice

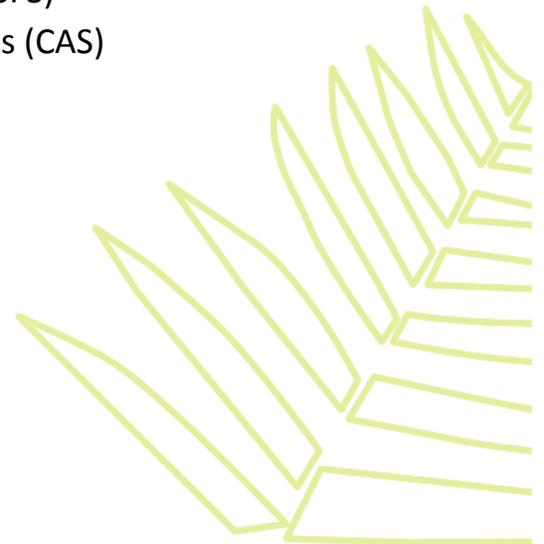
SFS 3800

Syllabus, Spring 2017

Faculty
Will Helenbrook, PhD

Office Hours: By appointment or Mon-Fri 4:30-5:30

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. Global threats to biodiversity
3. Philosophy, tools, and applications
4. Peruvian conservation
5. Global conservation strategies

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

Assessment

Assessment Item	Value (%)
Field Exercises (full report)	30
- Pilco Grande report	
- Night monkey parasitology and vocalization	
Field Laboratory (partial report)	30
- Avian species richness estimate (Mantanay)	
- Yucay agroforestry and climate change	
- Avian playback experiments (Agua Calientes)	
- Primate assessment (Manu Wildlife Center)	
eBird Project	5
Quizzes (Readings and Discussions)	10
Group Projects	10
Participation	5
Final Exam	10
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 typed assignments should be at least 5 pages in length (double spaced, not including bibliography, tables, or figures). The exercise itself will be done in groups; however, the report should be your own original work.

1) Pilco Grande conservation report - this exercise involves a visit by an ACCA member to discuss conservation concessions in Peru and to discuss SFS's involvement. The second part involves a visit to Pilco Grande - a community just outside of Manu National Park - that we will visit. In this excursion we will learn about measures being taken by the community and participate in a field component. You'll receive a grading rubric and laboratory handout in class.

2) Night monkey parasitology and vocalization - my research is currently based around understanding the behavior, ecology, and conservation of night monkeys, *Aotus nigriceps*. This field exercise will take place over several nights at Villa Carmen Biological Station. Student groups will rotate through field collections and laboratory analyses. You'll receive a grading rubric and laboratory handout in class.

Field Laboratories. Four field laboratories which will include collected field data and analyses, along with a few essay questions. Additional information will be provided in laboratory handouts. These assignments should be fewer than 5 typed pages (double-spaced). 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 species richness estimate (Mantanay) - we will visit a glacial valley very close to Hatun Valley. Here we will split into groups as we ascend the valley. Groups will rotate roles throughout the day. Several groups will collect bird presence/absence data based on audio and visual cues. Another group will record bird calls that will then be submitted to eBird. And lastly, another group will measure tree distribution of select species. These tree species will be used as an indicative of forest health and are critical habitat for several highly endangered birds in this valley.

2) Yucay agroforestry and climate change interviews - we will be visiting another glacial valley which is much more developed. Yucay valley towards the bottom includes family farms which could be characterized as agroforestry. We will meet with local farmers to discuss their approach, their perspective

and to interview them regarding biodiversity in the region and climate change. This project will then be submitted to

3) Avian playback experiments (Agua Calientes) - At the base of Machu Picchu and along the Inka Trail, we will conduct avian playback experiments. We will use calls to attract birds and calculate density estimates.

4) Primate assessment (Manu Wildlife Center) - towards the end of the semester, we will look at the relationship of forest structure on primate species richness and density in a primary forested habitat. There are 12 species of monkeys in this area, making it one of the most monkey rich areas of the entire world.

eBird Project (ebird.org). Report on species occurrence throughout the semester (with necessary information such as GPS coordinates). All avian observations throughout the semester should be documented in a field notebook. Random check-ins throughout the semester will assess thoroughness. You may include a photo (from other sources), drawings, descriptions, and GPS location, habitat type, and elevation (if possible). Opportunities exist throughout the semester at Mantamay; Yucay; Manu Wildlife (boat); Yucay, Agua Calientes, and any other time you are in the field (e.g. Villa Carmen Biological Research Station). You'll provide updates throughout the semester and a final product outlining your results throughout the semester, and proof of submission at eBird.org.

Take-home Quizzes and Participation. Two detailed and well-thought out questions need to be submitted at the beginning of conservation science class, along with answers for each. Please see GoogleCalendar and the schedule below for due dates. The questions and answers should reference both 1) readings and podcasts, and 2) exam-style questions that I will provide throughout the semester. For field exercises or laboratories, the questions and answers should reference hand-outs or associated readings and lecture videos. Written assignments should be roughly 1-2 pages max.

Group Project. Six different topics have been chosen. Your group will present on the topic (30 minutes), utilizing any resources that might be useful for teaching the class (e.g., videos, podcasts, readings), followed by 30 minutes of discussion based on either the presentation or readings. Groups should work with the professor well in advance to ensure content, topic, and presentation are sufficient.

Final Exam. One final exam which includes short answer and essay questions. Example questions will be provided throughout the semester as part of your quiz assignment.

Conservation Science Speaker Series. Several speakers from various Peruvian conservation organizations will be presenting throughout the semester. This is an opportunity to meet and ask questions of some eminent conservationists doing work here in the Sacred Valley and in the Kosnipata region.

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 - 100%	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 – 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

60 total contact hours

Code	Tentative Date	Contact Hours	Type	Lecture Title and Description	Required Readings (Bolded)	Assignments Due /Quizzes
CS1	2/1/2017	2	L, D	Introduction to conservation biology and biodiversity	Ed Abbey (Every book written); Hunter 2009 (Ch 1); Mora 2011; Keeping Wild (pg. 3-15)	Quiz
CS2	2/3/2017	2	D	Biodiversity: distribution and function <ul style="list-style-type: none"> • Global distributions of biodiversity • Functions of novel ecosystems • How many species 	Future of Life (Ch.1-2)	Quiz
CS3	2/6/2017	2	D	Value of biodiversity - intrinsic and extrinsic	Hunter 2009 (Ch 3); Keeping Wild (pg. 31-54); Turner 2007	Quiz

CS4	2/6/2017	1	D	Extinctions	Future of Life (Ch.3-4); Stoll-Kleemann 2016; Chatam 2015; Hunter 2009 (Ch 7 and 9)	Quiz
CS5	2/7/2017	1	D	GROUP 1: New vs. Old Conservation	Kareiva 2014; Kloor 2015; Salfasky 2010; Future of Life (pg. 160-189); Chan 2007; Soule 2013	
CS6	2/9/2017	2	L, D	Avian Prep (Mantanay)		Quiz
CS7	2/9/2017	4	FEX	Mantanay avian species richness estimates <ul style="list-style-type: none"> • Estimating species richness • Avian diversity and distribution • Impact of anthropogenic disturbances on wildlife 	Caudill 2016	
CS8	2/13/2017	1	D	Avian Lab Help		
CS9	2/13/2017	1	D	Global threats <ul style="list-style-type: none"> • Human population growth and consumption • Fragmentation • Bushmeat trade • Infectious disease 	Controversial Conservation-Hunting (podcast); Radiolab - Rhinohunting (podcast); Hunter 2009 (Ch 6)	
CS10	2/14/2017		CL	Population Viability Analysis	Hunter (pg. 139-149); Frankham 2014; Bouzat 2012	
CS11	2/17/2017		D	GROUP 2: Ex-situ and in-situ conservation	Podcast - Galapagos	Avian FEX
CS12	2/17/2017	2	L	Conservation Genetics	Edwards 2013	
CS13	2/20/2017	2	D	Small population phenomenon	Frankham 2010	
CS14	2/20/2017	1	D	GROUP 3: Endangered Species Act and CITES	Center for Biological Diversity 2016; Sodhi (Ch.12)	
CS15	2/20/2017	1	D	Yucay agroforestry and climate change Prep	Horton 2016	
CS16	2/21/2017	4	FLAB	Yucay agroforestry and climate change		
	2/25/2017					Yucay FLAB

CS17	3/13/2017 *	1	D	Guest Speaker: Pilco Grande	Pilco Grande Video (in Spanish only)	
CS18	3/13/2017	1	D	Avian playback experiments (Agua Calientes)	Fagan 2016	
CS19	3/13/2017	1	D	GROUP 4: Conservation Strategies and Successes	Lindenmayer 2006; Hance 2017; Dasgupta 2016; Butler 2012	
CS20	3/17/2017	3	FLAB	Avian playback <ul style="list-style-type: none"> • Experimental design • Density and distribution • Population viability analysis 	Dacier 2011	
CS21	3/17/2017	1	FL	Andean Bear Conservation; Guest Speaker	Peyton 1999 (Skim through); Rioz-Uzeda 2007	
CS22	3/22/2017	3	FL	Pilco Grande Community Conservation <ul style="list-style-type: none"> • Forest management • Ecotourism • Reforestation • Fire regimes 	Hunter 2009 (Ch 12); Ellison 2008	
	3/23/2017					Avian playback FLAB
CS23	3/27/2017	2	L, D	Parasitology and Conservation <ul style="list-style-type: none"> • Infectious disease 	Tompkins 2015; Thompson 2013	
CS24	3/27/2017	1	FEX	Group Exercises: Night monkey parasitology & vocalization Field Lab	Aquino 2012	
CS24	3/28/2017	1	D	GROUP 5: Peruvian Conservation Organizations	Woolf 2010; Rosenthal 2012;	
CS25	3/28/2017	1	L	Conservation Science Speaker Series		
	3/28/2017	1	FEX	Group Exercises: Night monkey parasitology & vocalization Field Lab		
	3/29/2017	1	FEX	Group Exercises: Night monkey parasitology & vocalization Field Lab		
	3/30/2017	1	FEX	Group Exercises: Night monkey parasitology & vocalization Field Lab		Pilco Grande FEX
CS26	3/31/2017	3	FEX	Night monkey parasitology and vocalization - Laboratory		

CS27	3/31/2017	0.5	L	Primate vocalization <ul style="list-style-type: none"> • Primate behavior and ecology • Spectral analysis 		
CS28	4/2/2017	1	L, D	Primate Assessment <ul style="list-style-type: none"> • Anthropogenic disturbances and wildlife • Habitat analysis • Primate diversity and ecology 	Chapman 2001; Levi 2009	
CS29	4/3/2017	4	FEX	Primate Assessment - Manu Wildlife Center		
CS30	4/3/2017	1	D	Primate Assessment FEX Help Session		
CS31	4/4/2017	1	FEX	Primate vocalization and parasitology laboratory continued (MANU)		
CS32	4/5/2017	1	FLAB	eBird Exercise - return boat ride		
CS33	4/8/2017		D	GROUP 6: REDD+ and Carbon Credits	Hajek 2011; Knight 2015	eBird Assignment Primate Parasite/Vocalization FEX
CS34	4/8/2017	2	D	Successes and Failures: Conservation Strategies	Shanee 2014; Keeping Wild (pg. 66-80 and 114-125); Keeping Wild (pg. 137-145)	
CS35	4/10/2017	2	D	Review	Rands 2010	Primate Assessment FEX
	4/11/2017			Final exam		

In-class Lecture (L); In-class Discussion (D); Field Lecture (FL); Field Exercise (FEX); Laboratory Exercise (FLAB); Computer Laboratory (CL)

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

COURSE BIBLIOGRAPHY

Readings

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