

CEDEI

BIO 123 Selected Topics

BIODIVERSITY AND CONSERVATION IN ECUADOR

Teacher:

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Classroom: 115

Course outline

Ecuador, with its diverse ecosystems, is one of the world's richest countries in terms of flora and fauna. But rapid population growth and the expansion of human activities are threatening the continued survival of Ecuador's biological diversity. This course is an introduction to Ecuador's ecology and to conservation biology with an emphasis on Latin America, and Ecuador in particular.

The first class is an introduction to the course and a brief (slide show) overview of Ecuador's main ecosystems. We will then introduce general concepts of conservation biology and biodiversity at the species, genetic and ecosystem levels and go on to examine in more detail the reasons behind Ecuador's outstanding biodiversity and the ecology, community structure and ecological importance of each of Ecuador's main geographical regions. We will discuss the threats that species and ecosystems face due to human activities and consider various conservation strategies from both theoretical and practical standpoints, taking into consideration the problems faced by conservation biologists in developing countries such as Ecuador.

During the term each student will carry out an independent investigation on a chosen topic. Papers will be presented to the class, written up and handed in at the end of the course.

Exams and grading

1. Mid-term exam (Multiple choice and short answers) 30%
2. Short assignments 10%
3. Final exam (multiple choice and essays) 30%
6. Term paper (25%)
7. Oral presentation of paper 5%

BIODIVERSITY AND CONSERVATION IN ECUADOR
MARCH 12 – APRIL 27 2007
SYLLABUS

Class 1 Monday March 12

Introduction

Introduction to Ecuador's ecosystems (slides).

Organization of the course, choice of topics for student research papers.

Class 2: Wednesday March 14

Introduction to conservation biology in Latin America

The global biodiversity crisis - what are we losing and does it matter? How many species are there?

Conservation of Macaws in Peru, keystone resources and Flagship species,

Class 3: Friday March 16

What is biodiversity?

The different levels of biodiversity:- Species diversity

What is a species and how do species evolve?

Genetic diversity, ecosystem diversity and organization, keystone species

Class 4: Monday March 19

Why is Ecuador so diverse?

The Main ecoregions of Ecuador, the role of the Andes and ocean currents.

Diversity in the tropics. Biodiversity “HotSpots”

Alpha and beta diversity

Class 5: Wednesday March 21

The Galapagos Islands

Introductory film and discussion of Galapagos ecology.

Colonization and adaptive radiation.

Class 6 Friday March 23

What is special about Islands?

Special characteristics of island communities. Extinctions on Islands, invasive species, island biogeography. Tourism and illegal fishing in Galapagos.

Class 7 Monday March 26

Introduction to Amazon Rainforest ecology – video.

Types of rainforest ecosystem, vegetation, diversity, seasonality.

Class 8 Wednesday March 28

Rainforest Ecology 2

soils and nutrient cycling, mycorrhizae.

Species interactions, herbivory and plant defenses

Pollination and seed dispersal

Class 9 Friday March 30

Deforestation, fragmentation and edge effects,

Deforestation In the Amazon region,

Brazil fragmentation experiments and relevance for the design of protected areas.

Class 10 Monday April 2

MID TERM EXAM

Multiple choice and short answer questions on material covered so far.

Class 11 Wednesday April 4

Review of mid term exam.

The Tropical Andes hot spot (video)

Class 12 Monday April 9

Visit to the Hacienda Mazan Rescue Centre

The illegal wildlife trade and the CITES convention. Guidelines for confiscated animals. Zoos, rescue centers and ex-situ conservation

Class 13 Wednesday April 11

How ecosystems change with altitude

Cloud forest and paramo ecology

Class 14 Monday April 16

Problems of small populations

Minimum viable populations, loss of genetic diversity, genetic drift,

Class 15 Wednesday April 18

Spectacled bear ecology and conservation

Establishing new populations

Class 16 Friday April 19

Ecuador's system of protected areas.

How to prioritize conservation efforts. Is sustainable development possible in Ecuador? People and protected areas in Ecuador.

Class 17 Monday April 23

The Chocó- Darien- Western Ecuador Hotspot

The diversity of coastal ecosystems in Ecuador, Tropical dry forest, mangrove forests.

Class 18 Wednesday April 25

Presentation of student research papers.

Class 19 Friday April 27

Final Exam

Multiple choice and essays

Reading List

Text Book: **A Primer of Conservation Biology**, Richard B. Primack, Sinauer Associates, third edition 2004.

The relevant sections of this book are before all other literature in the reader. All other material is in reading order.

Wilson, E.O., 1999. **Biodiversity at the Close of the Century** ppix-xxiv From *The Diversity of Life*, W. N. Norton and Company – New York – London.

Why are there so Many Species in the Tropics? pp 60-61 from R. Primack - Essentials of Conservation Biology, Sinauer associates, 1998.

Tropical Climates and Ecosystems pp 3-20 from Kricher, J, 1999 - A Neotropical Companion, Princeton University Press

Introduction and chapter 1, **Characteristics of the Islands** from Grant, P. R. 1999 *Ecology and Evolution of Darwin's Finches* Princeton University Press.

Galapagos species list from Jackson, M. 1991, *Galapagos, A Natural History Guide*, University of Calgary Press.

Carrasco, A 1995 **The Galapagos Islands: scientists, tourism and settlement pressures**, pp. 236-250. From: *National Parks Without People? The South American Experience*, Stephan y Thora Amend eds. IUCN 1995.

Rainforest structure and diversity pp 21-37 from An Introduction to the animals, Plants and Ecosystems of the New World Tropics from Kricher, J, 1999 - A Neotropical Companion, Princeton University Press.

Interconnections between Plants and Animals – The Web of Life, pp 74-88 from Whitmore, T.C., 2001. An Introduction to Tropical Rainforests - Oxford University Press.

Conservation Internacional, 2007: HotSpots www.biodiversityhotspots.org

Wright, T et al 2001, **Nest poaching in Neotropical Parrots**. Conservation Biology pp 710-720, vol 15, no 3

Decision time for Cloud Forests pp 1-36 L. A. Bruijnzeel & L S Hamilton, IHP Humid Tropics Programme series no. 13 UNESCO 2000

Hedberg, & Hedberg **Tropical alpine life forms of Vascular plants** pp 297-307

Goldstein, I et al 2006. **Andean Bear – Livestock Conflicts: A review**. Ursus 17(1): 8-15
Mangroves, pp1-15 from Hogarth, P.J. 1999. The Biology of Mangroves. Oxford University Press.

Additional reading material is available.