**NRM/BIOL 277: INTRODUCTION TO CONSERVATION BIOLOGY**
**Spring Semester 2011**

**Meeting Time:** Tuesday-Thursday 11:30 AM -1:00 PM

**Classroom:** Arctic Health Research Building (AHRB) Room 183 on the UAF Fairbanks campus.

**Instructor** Dr. Glenn Patrick Juday, Professor of Forest Ecology, School of Natural Resources and Agricultural Sciences
**Graduate Teaching Assistant** Brett Parks (email = bmparks@alaska.edu); 734 787-6011 (cell)

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**Office Hours** - (arrange in advance to confirm) Tuesday & Thursday 1:00-3:00 pm

**Course Text**

***Powerpoint lectures on the course Blackboard website***. A series of 24 lesson modules (CBL10.01 title, etc.) will be posted on the Blackboard site. These presentations are frequently updated (often incorporating information a day or two before class), extensively illustrated with graphics and pictures, and have key points in text charts.

***Articles and weblinks posted on the course Blackboard site***. Journal articles, agency reports, and items in the popular media.

**Endangered Species Recovery Plan report**

The U.S. Endangered Species program website (http://endangered.fws.gov/index.html) contains a great deal of information about the provisions, history, and operation of the Endangered Species Act (ESA). Students will select a listed species for which an approved recovery plan (http://endangered.fws.gov/recovery/Index.html#plans) has been adopted and prepare a 15-minute presentation to the class. Questions from these reports will be the subject matter for a quiz. The class will consider and develop an evaluation of the operation of the ESA and other approaches to endangered species conservation.

**Recommended Optional Supplemental Readings (for personal interest)**

1. *Precious Heritage: The Status of Biodiversity in the United States*. 2000. Bruce A. Stein, Lynn S. Kutner, Jonathan S. Adams (eds.) Oxford University Press, New York. 399 pp.

**Course Description**

This course will provide an overview of:

(1) the principles of the science of conservation biology and the contributions of several different integrative levels (molecular, physiology, genetic, population, ecology, earth system science) of biology to problems in conservation biology.

(2) the framework of organizations, laws, programs, and land management systems that are specifically focused on identifying, protecting, and maintaining natural diversity in the U.S., in selected other nations, and in international programs.

(3) case studies of specific threatened, endangered, or declining plants and animals, including the ecology and biology of the organisms, factors leading to their decline, and management and recovery methods and strategies.

(4) an overview of the conservation status of some major habitat regions of the world with an emphasis on northern hemisphere and high latitude areas but including ecosystems of particular interest from the tropics, oceans and elsewhere.

**Course Structure**

(A) The first part of the course is primarily lecture format. The goal is to cover the scientific principles of conservation biology and the main values-based rationales that drive conservation biology. Early in the course, students will choose and download an endangered species recovery plan from the U.S. Fish and Wildlife Service website.

(B) In the second half of the class students will be involved in analysis and presentation, applying the principles covered in the first part. Students will present their species recovery plan and analyze the effectiveness of the Endangered Species Act based on the sample of plans presented in class. In general students will be expected to analyze institutions and programs that work to maintain natural diversity in the second part of the course. Focus will be balanced between the U.S and Canada, other northern regions, and global situations.

**TOPIC OUTLINE** (Spring Semester 2010)

**Section I Principles**

A. Concepts of natural diversity (genetic, species, ecological).
B. The practical significance of natural diversity.
C. Extinction in geologic time and as a process.
D. Fragmentation and edge effects (central hardwood forest conservation).
E. Genetics – heterozygosity, independent assortment, inbreeding depression, outbreeding depression, genetic bottleneck, genetic drift and founder effect, dwarfism.
F. Minimum Viable Population (MVP); population biology of small populations, rescue effect
G. Patterns of diversity and landscape ecology, centers of diversity.
H. Environmental variability and natural diversity, environmental stochasticity.
I. Island biogeography.
J. Management interventions to promote natural diversity – in situ vs. ex situ conservation, reintroduction, corridors, compensating factors, approaches to sustainability.
K. Human demography, resource consumption, conservation and resource management.
L. Marine ecosystems.
M. Predator-prey systems.

**Section II Programs, Policies, and Laws**

A. The history and programs of The Nature Conservancy, "Conservation by Design" Natural Heritage Programs.
B. Landscape-scale preservation: The National Park System and the National Wilderness Preservation System, National Forests, Wildlife Refuges, and BLM Public lands.
C. International organizations & natural diversity: IUCN, CITES.
D. Features and provisions of the U.S. Endangered Species Act (criteria for listing and the listing process, critical habitat and Section 7 sanctions, multi-species listings, Habitat Conservation Plans, Recovery Plans and goals, de-listing).

**Section III Conservation Biology Threatened or Endangered Species across Taxonomic Groups**

A. Case studies of endangered animal recovery history and plans (Whooping Crane, Black-footed ferret, California Condor).
B. Restoration and management in a high-diversity, high-endemism region: Channel Islands National Park.
C. Consequences for ecosystems of extinct species (e.g. Passenger pigeon).
D. Ecosystem Level Projects: Endangered species conservation and urban growth in San Diego County.

**Section IV Conservation Biology at the Ecosystem Level**

A. Landscape connectivity and viability – restoration of tallgrass prairie and oak savanna, Florida Everglades, San Francisco Bay.
B. Aquatic and Marine conservation (large-scale marine ecosystem function and conservation, conservation of wetlands, river management and conservation biology).
C. Conservation biology of old-growth forest ecosystem of the Pacific Northwest.
D. History and conservation biology of the redwood forests.

**Section IV Conservation Biology in Northern Regions**

A. Boreal forest diversity and conservation (Russia, Nordic countries, Canada).
B. Conservation biology challenges from climate change, in Alaska and other northern regions.

## Grading Policy

I. Quizzes, Midterm, and Final Exam - 60% of Course Grade
Students will be examined on material from lecture handouts, the text, assigned documents downloaded from the Internet. There will be regular short quizzes (about 6 in number) on the basic factual content of the material assign for the course. Quizzes will total 20% of the overall grade. A midterm exam will include both short answer questions and short explanation or problem type questions. The midterm exam will total 20% of the overall grade. The final exam will total 20% of the overall grade. ***Learning Objectives*** will be provided that will highlight the most important information to master as a guide to quizzes and exams.

*The goals are to:*

1. Give the students an incentive to complete their reading assignments in pace with the presentation of lecture material, and to review in greater depth the topics that are introduced in lectures.
2. Highlight common knowledge that all student completing the course can be expected to know.
3. Provide the opportunity to review and retain factual information in a written form.
4. Provide a forum for responses that demonstrate integrative thinking, deductive reasoning, and well-developed and more extended responses.

II. Student Presentation - 30% of Course Grade
Students will be called upon to give 1 time-limited oral report on an official Endangered Species Recovery Plan. Recovery Plans selected for the presentation must be approved in advance by the instructor. Students are encouraged to select a topic for which they have some special background because of work or life experience, special interest, or curriculum background. Reports will be in the form of briefings, such as an employee of a private or public resource agency might be called upon to give to explain a recommended conservation policy. Students will be evaluated by the instructor on both the content and effectiveness of the presentation, including responses to critical questions following the presentation.

*The goals are to:*

1. Make students aware of a substantial body of conservation biology literature, some of it quite recent, that includes popular, semi-technical, and technical information, and to promote good reading habits.
2. Give students experience in summarizing a specific topic within a strictly limited time for presentation, making sense of it and identifying the most relevant points to reach conclusions.
3. Give students experience in speaking before their peers, with special emphasis on speaking cogently and fluently.

III. Class Response - 10% of Course Grade
Students will be asked questions in class concerning the content of assigned readings and handouts. Familiarity with this material will be expected. Students will also be asked to make critical inferences in class once basic definitions and lectures have been delivered.

*Rationale:*

1. Higher concepts cannot be developed if students are not familiar with basic assigned readings.

2. Interaction between the instructor and the students (questions from and to students, ability of students to respond when challenged) is an important aspect of education within the course.
3. Attendance is a tangible demonstration of the seriousness of the student toward the course.

**NRM/BIOL 277 Instructions for**
**Endangered Species Recovery Plan presentation**

1. Submit the Powerpoint presentation 2 full days before you are scheduled to present, so that it can be checked and posted on the Blackboard site. A deduction will be applied for late files.

2. Address and summarize each of the sections of the recovery plan; the required sections are the same in all plans and we want to compare them.

3. Do not overemphasize the biology of the species to the exclusion of all else; include budgetary and management issues as well.

4. Use visual aids where they are the most effective way of conveying the information (e.g. charts of numbers, distribution maps).

5. Get to the main point quickly; there is no time for "warm up" or digressions.

6. Summarize and synthesize; present the most interesting or critical facts, don't get lost in long lists of details.

7. Evaluate the material you have encountered. Is it reliable, complete, reasonable, do the plans correspond to the facts, etc?

8. Give your overall critique – will the implementation of this plan lead to recovery or not, and why? Address the hard questions and make a unique contribution of your own, don't just regurgitate

9. Update the status of the species, the recover effort progress, major new finding on the biology of the species, etc. (if the plan has been in force, and if the information has been developed)

10. Budget time for your talk at 17 minutes and 3 minutes of focused questions. Adhere to the time limit, it will be strictly enforced.

**Evaluation of Student Presentations**
**NRM/BIOL 277 Introduction to Conservation Biology**

Presenter _____

Assigned Paper/Topic_____

Evaluation of:

**Format**

EVALUATION CRITERIA (positive and negative)

ability to gain and hold audience attention

adherence to time limits

effectiveness of introduction

use of gestures

tone of voice verbal non-fluencies

eye contact mannerisms in delivery

smoothness in topic transition

run-on sentences

clarity and directness of expression

grammar

Content

EVALUATION CRITERIA (positive and negative)

organization within available time

comprehension of material

focus on the most relevant information

effectiveness of summarization

effectiveness of examples or illustrations

appropriateness of facts

review of relevant background concepts

Grade - __/20 (times expansion factor)