NR564: Systems Thinking and Biodiversity Conservation

Conservation Leadership Through Learning Colorado State University

INSTRUCTORS: Mike Gavin, michael.gavin@colostate.edu

OFFICE HOURS: 1230-130pm Thursdays via zoom. Please sign-up ahead via this googledoc: <u>https://docs.google.com/document/d/1F9n8mfm0YgaryqG1k5uAY5XIMqXcOMGD8hR0X4rdjxY/edit</u> Other times by prior appointment (please send email request if needed).

CLASS MEETINGS: classes will meet every Thursday 930am-1210pm in Natural Resources 243.

COURSE OVERVIEW

This course will explore a wide variety of issues related to the conservation of biological diversity. Conservation action faces enormous challenges. Planning policy and management responses to this crisis is particularly challenging because all conservation actions are embedded within complex and dynamic social-ecological systems.

We will examine the characteristics of social-ecological systems and the implications of social-ecological systems thinking for biodiversity conservation efforts. We will also explore several critical questions that frame biodiversity conservation: What are we trying to conserve? What are the threats to biodiversity? What drives conservation-related human behavior? What management tools are available to guide conservation action?

The goal of the course is for students to: 1) understand the characteristics of social-ecological systems and how they shape conservation management; 2) understand how to define biodiversity, 3) understand the major threats biodiversity faces, 4) understand possible drivers of conservation-related behavior, and 5) understand some basic principles from conservation biology and how they shape conservation management tools.

Please note that the material presented in this course will also be integrated with concepts from other courses during immersion learning weeks, which will encourage students to think in an interdisciplinary way about complex environmental issues.

COURSE MATERIALS, ASSIGNMENTS, AND GRADING

All readings, assignments, and other materials will be available through canvass.

Assignments	<u>% of final grade</u>	Due Dates
Immersion week assignment	20%	Sept 21
Individual presentation on responses to biodiversity threats	30%	Oct 12
Group presentation on conservation issue	29%	Nov 16
Discussion documents	21% (7% each x3)	Aug 31, Sept 21, & Nov 9

See below for details on assignments

Letter	grades	will	be	assigned	as	follows:
				0		

Percentage	Letter Grade
98-100%	A+
92-97%	А
90-91%	A-
88-89%	B+
82-87%	В
80-81%	B-
78-79%	C+
72-77%	С
70-71%	C-
65-69%	D
<65%	F

COURSE POLICIES

This linked page provides policies relevant to this course and resources to help with various challenges students may encounter: <u>https://col.st/2FA2g</u>

This course will adhere to the CSU Academic Integrity Policy as found on the Student' Responsibilities page of the <u>CSU General Catalog</u> and in the <u>Student Conduct Code</u>.

At a minimum, violations will result in a grading penalty in this course and a report to the Office of Student Resolution Center.

Academic Integrity (also see: https://tilt.colostate.edu/Integrity/StudentResources. Accessed: August 16, 2023)

At minimum, academic integrity means that no one will use another's work as their own. The CSU writing center defines plagiarism this way:

"Plagiarism is the unauthorized or unacknowledged use of another person's academic or scholarly work. Done on purpose, it is cheating. Done accidentally, it is no less serious. Regardless of how it occurs, plagiarism is a theft of intellectual property and a violation of an ironclad rule demanding 'credit be given where credit is due.'"

Source: (Writing@CSU Guide.<u>http://writing.colostate.edu/guides/guide.cfm?guideid=17.</u> Accessed, August 16, 2023)

If you plagiarize in your work you could lose credit for the plagiarized work, fail the assignment, or fail the course. Plagiarism could result in expulsion from the university. Each instance of plagiarism, classroom cheating, and other types of academic dishonesty will be addressed according to the principles published in the CSU General Catalog and in the **Student Conduct Code**.

Of course, academic integrity means more than just avoiding plagiarism. It also involves doing your own reading and studying. It includes regular class attendance, careful consideration of all class materials, and engagement with the class and your fellow students. Academic integrity lies at the core of our common goal: to create an intellectually honest and rigorous community.

Requests for Assignment Extensions: In fairness to your fellow classmates, extensions on due dates for assignments will not be granted except in cases where extenuating circumstances arise and can be documented. If this is the case, please let me know at the earliest possible opportunity to request an extension. In the absence of being granted an extension, the policy below applies for late submissions.

Policy on Late Assignments: Late assignments will be penalized 5% per calendar day (including weekends).

Working in a Group: Most jobs require employees to work in groups at some point. Frustration or conflict can occur when working in a group. If you find yourself working in a group for this class, or any other one, where conflict is negatively affecting production, professional is available via the Student Resolution Center: <u>https://resolutioncenter.colostate.edu/about-us/</u>

Basic Needs Statement: At CSU, Rams take care of Rams—period. If you are experiencing food, housing, and/or transportation insecurity, please contact <u>lsc_basicneedsinfo@colostate.edu.</u>

Student Disability Center Accommodations: Students who have federally supported disabilities will find information about processes and supports available at this site: https://disabilitycenter.colostate.edu/accommodations-process/

COURSE SCHEDULE

Date & Time	Topics	Assignments
August 24	 Introduction & course logistics Introduction to social-ecological systems thinking 	
Aug 31	 Introduction to social-ecological systems theory and resilience Presentation and research skills 	Assignment: Discussion document 1 (see canvass for details)
Sept 7	Immersion Week	No Class
Sept 14	 Implications of SES theory for conservation management Introduction to Open Standards of Conservation Planning (T. Schulz) 	
Sept 15	• Immersion day: Open Standards of Conservation Planning	All day

(Also see Canvass for readings and more details on assignments)

Sept 21	Immersion Week: Open Standards of Conservation Planning	Assignment due: Immersion learning week assignment (due Sept 21)
Sept 28	 What is biodiversity?: introduction to biodiversity across scales and threat classification system Fire management, resilience, and SES (T. Cheng) 	
Oct 5	Immersion Week	Class will not meet
Oct 12	• Presentations on responses to threats to biodiversity	Assignment due: Individual presentations due
Oct 19	 Presentations on responses to threats to biodiversity What are we conserving? (the focus and scale of conservation) 	Assignment: Discussion document 2 (see canvass for details)
Oct 26	• How do we conserve? Example: Principles of conservation biology and protected area design	
Nov 2	 How do we conserve? Example: Protected area design exercise and discussion How do we conserve?: Beyond government protected areas 	
Nov 9	 Will we conserve?: Drivers of conservation action Monitoring non-compliant behavior 	Assignment: Discussion Document 3 (see canvass for details)
Nov 16	• Presentations on conservation issues	Assignment Due: Presentations on conservation issues
Nov 23	• Fall Break	No class

Nov 30	Immersion Learning Week	No Class
Dec 7	Presentations on conservation issuesHow do we fund all this?Course summary	

ASSIGNMENT DETAILS

Discussion documents:

For this assignment you will be asked to answer a series of questions (detailed on canvass). These questions will help link our class discussions with the ideas presented in the readings for that week. You should be clear and concise, and limit your answers to one page in length. You can use any format you see fit (paragraphs, bullet points, diagrams etc). The discussion documents must be submitted via canvass. You should also bring a copy (electronic or paper) to class to help guide discussions.

Individual presentation on responses to threat to biodiversity:

For this assignment you will present a clear, concise, and professional presentation focused on examining the current state of knowledge on addressing a threat to biodiversity. Your presentation should focus on a specific biodiversity target (species or ecosystem) and should aim to address three main points:

- What are the main direct threats to the biodiversity target (link the direct threats to Salafsky et al's IUCN threat classification system)?
- What is a current approach (or approaches) being used to reduce one of the direct threats, and what scientific evidence do we have regarding the level of success of this approach(es)?
- Define 2-3 major research questions that need to be addressed to advance conservation action on the issue (i.e., improve the chances of success in reducing the threat). In other words, given your review of the literature, what major gaps exist in our understanding of the issues, which need to be filled for long-term conservation progress to be achieved. These questions should reflect your readings and review of the literature, and therefore you need to justify why these questions are critical by relating them to the relevant literature.

Your critique of the current approaches and development of 2-3 research questions should draw on relevant literature. Be sure to correctly cite all your sources and include a literature cited slide (at the end). Your sources should all be from academic journals or other reputable sources (conservation organization documents, government documents, academic books, edited volumes, etc). You should cite at least 5 academic *peer-reviewed* studies (i.e. journal articles or peer-reviewed books).

Your presentation should be limited to 10 minutes (it will be timed) and include a maximum of 8 slides (1 of which will be the literature cited slide at the end).

Due: Submit any presentation materials (e.g., slides used) via canvass before class begins.

Grading Criteria: clear, well-organized, professional presentation style (20%), demonstrated knowledge of the current literature on current approach(es) to reducing threat on the biodiversity target including citation of at

least 5 peer-reviewed studies (30%), thoughtful analysis of the issues and presentation of unique perspective on the issues (it is expected that the presentation is not just an overview of literature but includes your own ideas and analysis) (20%), insightful, specific research questions which reflect clearly defined gaps in the relevant academic literature (30%)

Presentation on agency response to biodiversity conservation issue:

You will work in groups to prepare a briefing presentation on a current biodiversity conservation issue for a government agency. First, you will need to select the issue. Key sources to guide this search for a current issue will be media outlets, including google news, google etc. One of the goals of this exercise is to become familiar with recent/current conservation issues. Do not select an issue that any of your group has worked on previously or used for the individual presentations. The issue should be under debate currently (or at least within the past five years). I encourage you to discuss possible conservation issues with me well ahead of time.

Once you have an issue identified, you will need to identify a government agency that is responsible for handling at least some critical conservation aspects of the issue. This agency may be from any scale from international to local. You will need to ensure that the agency you choose has some power to affect the issue in question. Be careful how you choose the issue. You want it to be specific. If it is too broad ('climate change impacts on biodiversity' would be way too broad) you will have a difficult time narrowing down which agency is relevant and which scientific literature you should focus on etc. Stick with specific case studies.

The presentation needs to cover the following:

1. An overview of the issue: What is the conservation challenge? Who are the key stakeholders and what are their potential gains and/or losses?

2. Why is this agency in a position to make a difference with the issue? What legislation is relevant to the issue and what does this legislation say in regards to the issue? Summarize how this legislation may guide the government agency's response to the issue. Assume that the government official knows the legislation. Therefore, you do not need to summarize every point in the legislation. You need to be concise and clearly identify what aspect of the legislation is relevant. Do not spend your limited time quoting from legislation. Rather, explain why you think a particular section of the legislation is relevant. Are there any potential controversies in terms of how the legislation might be interpreted in regards to the issue you are focused on?

3. Explain how this conservation challenge is embedded within a social-ecological system. How is the conservation challenge shaped by both the social and ecological components of the system? Discuss 3-5 key characteristics of the social-ecological system and how these characteristics will shape the agency's potential responses to the conservation challenge.

- 4. Your recommendation: Outline multiple (at least 2) possible responses the agency might undertake to address the conservation challenge. You will need to provide a summary of the evidence that exists supporting each of these possible responses. Evidence may come from a variety of sources, including peer-reviewed literature, agency, community, or NGO documents, etc. (Be sure to properly cite sources in the presentation.)
- 5. How do the recommended approaches reflect potential drivers of environmental behaviors?

6. Describe how the agency can adopt an adaptive management approach (including experimentation, learning and feedback) to exploring the effectiveness of these possible responses over time. Remember you are not required to agree with the government agency's current approach. Rather you need to inform the agency of the best possible ways forward, given the guiding principles of the legislation, the concerns of key stakeholders, the evidence available, and the use of social-ecological systems theory, theory on drivers of conservation behavior, and adaptive management principles.

General Instructions for the Presentation: Each group will have 30 min to present with 5 min for questions. Be sure your presentation covers the major points outlined above. Each group member must contribute to both the preparation and delivery of the presentation. Remember your audience (the government official(s)).

Grading criteria: presentation style: clear, concise, creative (15%), introduction and overview of conservation issue (15%), summary of agency's role and legislation relevance (10%), links to social-ecological systems characteristics (20%), recommendations with links to theory on potential drivers of environmental behaviors (20%), links to adaptive management (20%)

Due: Presentations will be made in class, and your group should submit a copy of your presentation via canvass before class on November 16th.

Immersion week assignment: Details will be provided during introduction to the immersion learning week.