ESM 270: Conservation Planning and Priority Setting
Course Syllabus, Spring 2021

Instructor: Professor Ashley Larsen (Larsen@bren.ucsb.edu)
Prof. Larsen’s Office hours: Monday 3:15-4:15, Wednesday-- time TBD.

Teaching Assistant: Nakoa Farrant (farrant@bren.ucsb.edu)
Office hours: Monday 3:15-4:15, Tuesday time TBD.

Zoom discussions (required): All Mondays: 2:00-3:15pm; Weds June 2, 2-4pm

The objectives of this course are for you to:
1. Understand the principles and concepts underlying conservation planning
2. Understand how these principles are applied in real world settings
3. Gain exposure to and experience with a range of conservation planning tools

Course Structure: For most weeks, there will be one lecture on a key topic in conservation planning and one computer lab exercise using a planning tool that reflects concepts from lecture. We are going to “flip” the classroom, watching lectures in advance and discussing material during in-person meetings.

Lectures: Lectures will explore different topics in conservation planning. Lectures will be pre-recorded and a link to the week’s lecture will be posted on Gauchospace by Wednesday at 9:00am the week before. There will be a series of questions embedded and/or accompanying the lecture. Please view lecture in advance and “bring” questions from lecture to the zoom break-out discussions on Mondays.

Zoom Discussions: Discussions will begin with a short student presentation of the readings and a class activity (see details below). Students will then break out into discussion groups to go over the structured lecture questions and any other questions about lecture. We will come back together at the end of lecture to discuss lingering questions and report back.

Readings: Required readings accompany each lecture to provide context. All readings will be available on Gauchospace. There will be weekly reading quizzes (True/False). These quizzes will be very short and cover the main points of the readings. Quizzes will be 5 minutes in duration and available on Gauchospace from Wednesday the week before until the start of the zoom discussion (Monday at 2:00pm). Please complete the readings before watching lecture. Additional, optional readings will be posted on gauchospace each week.

Lab and Lab Assignments: Lab sections are designed to explore commonly used tools in conservation planning. We will pre-record an introduction to the tool. We will also pre-record a short demo of the lab exercise. Students will then use real data to address a short conservation problem by repeating and extending the demo on their own. Students have access to all data and computer programs through Remote Desktop. We will create a Gauchospace Forum for student discussion of the labs and will hold zoom office hours to facilitate answering questions. However, successfully completing the labs will likely require substantial troubleshooting and googling of issues on your own. As such, analyses will often require at least 2 hours to complete. All analyses should be completed individually, though peer-to-peer discussion is encouraged. Written assignments #2-7 will be completed in pairs, with the first author responsible for the rough and final drafts, and the second author responsible for detailed peer-review comments. Pairs will work together for two consecutive assignments such that each individual is a first and second author on one. A template for the written assignment is posted on Gauchospace. A google doc with the class participants is on Gauchospace. Please coordinate partners amongst yourselves and rotate partners after 2 labs. You are responsible for coordinating with your partner to complete the write-up.
**Project Proposal:** The project proposal is included to encourage deeper exploration of practical conservation planning challenges. A proposal includes scoping of a problem, objectives, proposed data and proposed (and often preliminary) analyses. Proposals can be related to Group Projects or another topic that aligns with the concepts and tools presented in class. We encourage students to explore topics early in the quarter and discuss with the TA or professor. Two “working labs” will be devoted to project proposals. Additional time outside of class time will be necessary to complete a thorough proposal. Proposal presentations and write-ups will be due week 10. See proposal template on Gauchospace for more details.

**Attendance & Participation:** Particularly with remote learning, engagement with the material is critical. For remote aspects, participation will be recorded as engagement with lecture, effort troubleshooting labs, and meaningful contributions to the class forum (please subscribe to updates). For live (zoom) discussions, arriving on time and staying the entire period is necessary, but not sufficient for participation credit; engaging with the questions and contributing to the discussion are also required. Participation will be used to adjust final grades up or down. Do not underestimate the importance of consistent, meaningful participation to your learning (or grade) outcomes. Please email the instructor asap (Larsen@bren.ucsb.edu) if you become ill or for other unexpected conflicts. Make-up work is available to recover participation points (2pts/class) for excused absences, when the instructor is notified before class.

**Student-led Discussion:** Most weeks (2-8) will include a student-led discussion of the readings. Sign up for a date on Gauchospace. Students leading the discussion should be the experts on the papers assigned. This means you should dig into the concepts and terms and be able explain them to your classmates. You are welcome to contact the TA or professor (at least 24h in advance) with specific questions. Student-led discussions include 3 components. 1) Students should prepare a short presentation that briefly summarizes the main points, clarifies any confusing terms or important concepts, and puts the paper(s) in context of the broader literature or conservation issue. The presentation will occur at the start of the Monday zoom meeting. 2) Students should also prepare a short exercise to engage the class in the material during the Monday zoom meeting. 3) Students should upload a ~ 1 page summary of the reading to Gauchospace. A grading rubric and more details are posted on Gauchospace.

**Office Hours:** We will hold multiple weekly office hours. To serve as many students as possible, we will create 15m sign ups. Please check the sign up before dropping in. We will also monitor the class forum. Regardless of how you reach us, please be sure to google the problem/concept and try to troubleshoot in advance.

**Grading:** Grading is based primarily on lab and project assignments and participation.

- **Weekly Lab Assignments:** 12 points each (1 opinion piece + 6 labs, 84 points total)
- **Student-led paper discussions:** 20 points
- **Reading Quizzes:** 2 points each (14 points total)
- **Project presentation:** 12 points
- **Project proposal:** 12 points
- **Participation:** 38 points

*See Gauchospace for templates and grading rubrics.

*Assignments are due at 10:00pm on the day listed (remote course).

*Late assignments will lose 1 point if late, and 1 point each additional day it is late.

**Acknowledgements:** ESM 270 was developed by Profs. Frank Davis & Ben Halpern. Former TA, Owen Liu, designed the R lab, which parallels the ArcGIS hotspots lab. The material has also benefited from engaged students in prior classes.
**Consider the syllabus a living document. Lecture topics & schedule are subject to change **

**Note:** The below schedule reflects the week’s topics. The only mandatory scheduled class time for the remote course is Monday 2-3:15pm for discussion of lecture material (unless otherwise noted), and June 2 2-4pm for presentations. **We strongly recommend that you try the labs by Wednesday, following the below schedule:**

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<th>Week 1</th>
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<td>Monday, March 29 (lecture 1, synchronous)</td>
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<td>Introduction to Conservation Planning</td>
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**Lecture 2 & readings**
Conservation elements and setting conservation objectives
*Readings:* Kareiva & Marvier 2012, Soule 2013

**Wednesday, March 31**
*Assignment 1 due:* What should conservation objectives be? *This assignment should be completed solo.*

**Lecture 3 & readings**
Species-level conservation targets (viable populations)
*Readings:* Beissinger and Westphal 1998, Doak et al. 2015

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<th>Week 2</th>
<th><em>Monday’s discussion covers lectures 2 &amp; 3</em></th>
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<td>Monday, April 5 (Discussion of lectures 2 &amp; 3)</td>
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**Wednesday, April 7**
Begin species range mapping with Maxent lab

**Lecture 4 & readings**
Multi-species priorities and multi-criteria planning

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<td>Monday, April 12 (Discussion of lecture 4)</td>
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**Wednesday, April 14**
Begin mapping hotspots with ArcGIS (or R or QGIS or…?)
*Assignment 2 due:* Using Maxent to map species ranges

**Lecture 5 & readings**
Scaling up (conservation networks and portfolios)

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<td>Monday, April 19 (Discussion of lecture 5)</td>
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**Wednesday, April 21**
Begin Marxan as a planning tool for reserve design lab
*Assignment 3 due:* Using ArcGIS to map hotspots in the California Current
Lecture 6 & readings
Conservation in a dynamic world

Week 5
Monday, April 26 (Discussion of lecture 6)
Wednesday, April 28
Begin modeling connectivity with Circuitscape lab
Assignment 4 due: Reserve network design with Marxan

Lecture 7 & readings
Restoration, reintroductions and rewilding

Week 6
Monday, May 3 (Discussion of lecture 7)
Wednesday, May 5
Begin hijacking tools for restoration planning lab
Assignment 5 due: Exploring connectivity between patches

*Readings (see wk 7)
Social science in conservation planning
Readings (+ quiz): Leslie et al. 2015, Sarkar & Montoya 2011

Week 7
Monday, May 10 Synchronous guest lecture, N. Farrant.

Wednesday, May 12
Begin AHP elicitation lab
Assignment 6 due: Exploring how to make restoration more strategic

Lecture 9 & readings
Ecosystem services

Lecture 10 & readings
EBM/Comprehensive Planning
Readings: Halpern & Agardy 2013
*Quiz on combined readings

Week 8- *Monday’s discussion covers lectures 9 & 10
Monday, May 17 (Discussion lectures 9 & 10)

Wednesday, May 19
Assignment 7 due: Eliciting and mapping preferences for conservation priorities

Week 9
Monday May 24: Memorial day, no class.

Wednesday, May 26
Project, working lab
Assignment due: None

Week 10
Monday, May 31 (Discussion)
Project, working lab

Wednesday, June 2 (synchronous)
Presentations: project proposal & proposed data/analyses

Friday June 4
Assignment 8 due: Conservation Planning Project Proposal