

## Conservation of Wildlife Populations – WILD 470

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**INSTRUCTOR:**

Dr. Angie Luis, Office: Forestry 207A, Email: [Angela.Luis@umontana.edu](mailto:Angela.Luis@umontana.edu)

Office Hours: Mondays 2-2:50, Wednesdays, 1-1:50, or by appointment

Office hours will be on [Zoom at this link](#). Please send us an email to let us know you will be attending office hours at that link.

**TA:**

Chris Hansen, [christopher3.hansen@umconnect.umt.edu](mailto:christopher3.hansen@umconnect.umt.edu)

Office Hour: Tuesdays 1-1:50. Also on [Zoom at this link](#); let us know you will attend.

**REQUIRED READINGS:**

Conservation of Wildlife Populations, 2<sup>nd</sup> edition, by L. Scott Mills

- Chapters for each class shown in brackets

Additional readings to be assigned

**CLASS MEETING TIMES:**

Most weeks:

MW 12:00-12:50 UC 303 (South Ballroom)

(half the class at a time – you be assigned a day)

R 1:00-2:50 Gallagher Business Building 123

F 12:00-12:50 [Zoom](#) password: 'wildpops'

**CLASS STRUCTURE:** This will be a blended/hybrid class. Most weeks, half the class will meet in person in Monday, the other half on Wednesday in UC 303. We will all meet on Zoom on Friday. About one lecture's worth of material a week will be asynchronous online that needs to be completed before your Monday/Wednesday meeting time. For the Thursday computer lab, we will all meet in Gallagher 123. For all the in-person sessions, the Zoom link will also be live and recorded, so if for any reason you need to or want to be remote, you can. This structure is subject to change.

**COURSE OBJECTIVES:** By the end of the course students should understand how we measure populations (abundance/density) and demographic rates (birth, death, immigration, emigration), what affects populations, and how we manage/conserves populations. Students will gain proficiency with quantitative methods in population ecology including various types of population models and several ways to estimate population processes. Additionally, students will demonstrate their understanding of the scientific method and proficiency of scientific writing.

**TENTATIVE SCHEDULE**

August

Wed	19	Intro & Reliable Knowledge [Ch. 1, 2]
<i>Thurs</i>	<i>20</i>	<i>Lab 1: Intro to R</i>
Fri	21	Study design and Hypothesis testing [Ch. 2]
Mon	24	Gaining Reliable Knowledge cont. [Ch. 2]
Wed	26	Likelihood & AIC [Ch. 2]
<i>Thurs</i>	<i>27</i>	<i>Lab 2: Standard Error and Deviation</i>
Fri	28	Estimating abundance (mark-recapture) [Ch. 4]

September

Mon	31	Capture Mark Recapture [Ch. 4]
Wed	2	CMR Survival [Ch. 4]
<i>Thurs</i>	<i>3</i>	<i>Lab 3: Population Estimation (Lincoln-Peterson)</i>
Fri	4	Survival & Reproduction [Ch.4]

**Annotated Bibliography Due**

Mon	7	<b>Labor Day – no class</b>
Wed	9	Review for Exam
<i>Thurs</i>	<i>10</i>	<i>Lab 4: Hypotheses &amp; Predictions</i>
Fri	11	<b>EXAM I</b>

Mon	14	Exponential Population Growth [Ch. 5]
Wed	16	Variability in Growth [Ch. 5]
<i>Thurs</i>	<i>17</i>	<i>Lab 5: Exponential Growth</i>
Fri	18	Age-Structured Population models [Ch. 6]

**Hypotheses and Predictions for Research Proposal Due**

Mon	21	Matrix population models 1 [Ch. 6]
Wed	23	Matrix population models 2 [Ch. 6]
<i>Thurs</i>	<i>24</i>	<i>Lab 6: Matrix Models I</i>
Fri	25	Sensitivity Analysis [Ch. 6]

October

Mon	28	Sensitivity Analysis & Variation [Ch. 6]
Wed	30	Matrix Exercises
<i>Thurs</i>	<i>1</i>	<i>Lab 7: Matrix Models II</i>
Fri	2	Review for Exam

**Draft of Hypotheses & Methods Sections**

	Mon	5	<b>EXAM II</b>
	Wed	7	Density Dependence 1 [Ch. 7]
	Thurs	8	<i>Lab 8: Peer Review</i>
	Fri	9	Density Dependence 2 [Ch. 7]
	Mon	12	Density Dependence & Predation [Ch. 7,8]
	Wed	14	Predation 1 [Ch. 8]
	Thurs	15	<i>Lab 9: Density Dependence</i>
	Fri	16	Predation 2 [Ch. 8]
	Mon	19	Disease
	Wed	21	Review for Exam
	Thurs	22	<i>Lab 10: Writing Lab</i>
	Fri	23	<b>EXAM III</b>
	Mon	26	Genetic variation & fitness [Ch. 9]
	Wed	28	Connectivity [Ch. 10]
			<b>Draft Research Proposal Due</b>
	Thurs	29	<i>Lab 11: Small Population Conservation</i>
	Fri	30	Metapopulations & Ecological Traps [Ch. 10]
November	Mon	2	<b>Veteran's Day – no class</b>
	Wed	4	Human perturbations on populations [Ch. 11]
	Thurs	5	<i>Work on proposals or bonus lab</i>
	Fri	6	Harvest Management 1 [Ch. 14]
			<b>Proposal Reviews Due</b>
	Mon	9	Harvest Management 2 [Ch. 14]
	Wed	11	Harvest Management 3 [Ch. 14]
	Thurs	12	<i>Lab 12: Harvest</i>
	Fri	13	Extinction Vortex [Ch. 12]
	Mon	16	Population Viability [Ch. 12]
	Wed	18	<i>Final Exam Review</i>
			<b>Final Research Proposal Due</b>

**GRADING:** Grades will be based on 3 mid-term exams, a final, lab exercises, online activities & lessons, and a written research proposal (with multiple parts). Late lab assignments will be penalized 10% for each day late. Grades will be kept up to date on Moodle.

	percentage		pts
Exams	43%	Exam 1	100
		Exam 2	100
		Exam 3	100
		Final	140
subtotal			<b>440</b>
Labs	23%	12 labs @ 20 pts each	<b>240</b>
Online Activities	15%		<b>150</b>
Proposal	19%	Annotated Bibliography	20
		Hypotheses/Predictions	20
		Draft Sections	30
		Full Draft	10
		Reviews	20
		Final Proposal	100
subtotal			<b>200</b>
total points	100.0%		<b>1030</b>

**RESEARCH PROPOSAL:** Each student is required to prepare a research proposal on a topic of their choice related to wildlife population ecology. The proposal should include an introduction to the topic, hypotheses and predictions, research methods, expected results, implications, and literature cited. The proposal must also include a budget. The length of the proposal including all sections is 8 pages, double-spaced with 12-point font (5-6 pages text + cover letter, references, and budget). The full proposal assignment will be broken down into a few sub-assignments, including an annotated bibliography (due Sep 4), Hypotheses and Predictions (as bullet points, due Sep 18), a draft of the Hypothesis Section and the Methods Section (due Oct 2), a full draft (due Oct 28), anonymous peer-reviews (due Nov 6), and the final proposal (due Nov 18). See above for grade break-down. See Moodle for documents with more details.

**UPPER DIVISION WRITING REQUIREMENTS:** WILD 470 in conjunction with two additional upper division writing courses meets the university upper division writing requirement. WILD 470 specifically meets the following outcomes:

- Identify and pursue more sophisticated questions for academic inquiry

- Find, evaluate, analyze, and synthesize information effectively from diverse sources
- Manage multiple perspectives as appropriate
- Recognize the purposes and needs of discipline-specific audiences and adopt the academic voice necessary for the chosen discipline
- Use multiple drafts, revision, and editing in conducting inquiry and preparing written work
- Follow the conventions of citation, documentation, and formal presentation appropriate to that discipline
- Develop competence in information technology and digital literacy

### **COVID-19 SAFETY:**

I expect students, TA, and I will follow UM safety protocols, as bulleted below. **If students decide not to follow all safety protocols, I will immediately transition all activities to fully remote for the entire class.** This is for the safety of everyone to minimize transmission. (Mostly asymptomatic) transmission is likely to occur on campus, whether through contacts at school, work, or socializing. We need to do our best to try to minimize that transmission. If you are young and healthy, your risk of severe infection is low, but it is not zero, and we need to be mindful of starting a chain of transmission that may eventually infect someone who is high risk. We are in this together.

Because this class is hybrid, you will be able to participate remotely if you have been exposed, need to quarantine, are sick, or if you would just like to minimize your risk. Please let me know if you have concerns or need any other accommodations. This is a novel and ever-changing landscape so mutual respect, honest and early communication, and flexibility are needed for us to have a successful semester.

### UM safety guidelines:

- Mask use is required within the classroom
- You must clean your personal work space when you arrive and before you leave the classroom with your provided cleaning kits
- Classrooms may have one-way entrances / exits to minimize crowding
- Please do not congregate outside the classroom before and after class
- Specific seating arrangements will be used to ensure social distancing and support contact tracing efforts
- Class attendance will be recorded to support contact tracing efforts
- Drinking liquids and eating food is discouraged within the classroom (which requires mask removal)
- Stay home if you feel sick or are exhibiting any COVID-19 symptom
- If sick, please contact the Curry Health Center at (406) 243-4330
- Up-to-Date COVID-19 Information from the University of Montana
  - UM Coronavirus Website: <https://www.umt.edu/coronavirus>
  - UM COVID-19 Fall 2020 website: <https://www.umt.edu/coronavirus/fall2020.php>
- Please remain vigilant outside the classroom in mitigating the spread of COVID-19

**PLAGIARISM:** Plagiarism will not be tolerated and will result in failing the course.

**STUDENT CONDUCT CODE:** All students must practice academic honesty. Academic misconduct is subject to an academic penalty by the course instructor and/or a disciplinary sanction by the University. All students need to be familiar with the [Student Conduct Code](#).

**STUDENTS WITH DISABILITIES:** The University of Montana assures equal access to instruction through collaboration between students with disabilities, instructors, and Disability Services for Students (DSS). If you think you may have a disability adversely affecting your academic performance, and you have not already registered with DSS, please contact DSS in Lommasson 154 or 406.243.2243. I will work with you and DSS to provide an appropriate modification.

**BASIC NEEDS:** Any student who faces challenges securing their food or housing and believes this may affect their performance in the course is urged to contact the Office for Student Success (sarah.swager@umontana.edu or (406) 243-5225) for support. Furthermore, please notify the professor if you are comfortable in doing so. This will enable her to provide any resources that she may possess.

**GRADING OPTION:** Please note, this class is offered for traditional letter grade only, it is not offered under the credit/no credit option.

**DROP DATES:** After registering and through the **first seven (7) instructional days of the semester**, students may use [Cyberbear](#) add courses or change sections and credits; through the **first fifteen (15) instructional days of the semester**, students may use [Cyberbear](#) to drop courses. Fees are reassessed on the sixteenth day of the term. Added courses and credits may result in additional fees. For courses dropped by the fifteenth instructional day, no fees are charged and courses are not recorded. (For deadlines and refund policy for withdrawal from all courses, see the Withdrawal sections of this catalog.)

An instructor may specify that drop/add is not allowed on the internet. A drop/add form is used to make changes in these courses, if approved by the instructor.

After adding a course, the credit/no credit grading option or auditor status may be elected on the internet or on a form available at the Registration Counter in Griz Central in the Lommasson Center. These options are not allowed for some courses as identified in the Class Schedule. Change of grading option to audit is not allowed after the 15 instructional day.

**Beginning the sixteenth (16) instructional day of the semester through the forty-fifth (45) instructional day**, students use paper forms to drop, add and make changes of section, grading option, or credit. The drop/add form must be signed by the instructor of the course and the student's advisor. The signed drop/add form must be returned to the Registration Counter (or the Registrar's Office at Missoula College) no later than the **forty-fifth** instructional day. A

\$10.00 processing fee is charged for each drop/add form. Added courses and credits may result in additional fees. There are no refunds or reductions of fees for courses dropped and grades of W (withdrew) are recorded.

**Beginning the forty-sixth (46) instructional day of the semester through the last day of instruction before scheduled final examinations, students must petition to drop.** The petition form must be signed by the instructor of the course and the student's advisor and, the dean of the student's major. A \$10.00 processing fee is charged for each petition. There are no refunds or reductions of fees for courses dropped, and the instructor assigns a grade of WP (withdrew/passing) if the student's course work has been passing or a WF (withdrew/failing) if the course work has been failing. These grades do not affect grade averages but they are recorded on students' transcripts.

Documented justification is required for dropping courses by petition. Some examples of documented circumstances that may merit approval are: accident or illness, family emergency, or other circumstances beyond the student's control.

The opportunity to drop a course for the current term for such a course ends on the last day of instruction before scheduled final exams. Dropping a course taken in a previous term or altering grading option or audit status for such a course is not allowed. The only exceptions are for students who have received a grade of NF (never attended).