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Fall 9-1-2021

### WILD 470.01: Conservation of Wildlife

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## 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 & Wednesdays, 1-1:50, or by appointment

Office hours can be in person & masked or on Zoom. Just drop by during office hours or make an appointment with me for a Zoom meeting.

### TA:

Leah Joyce, [leah.joyce@umconnect.umt.edu](mailto:leah.joyce@umconnect.umt.edu)

Office Hour: Tuesdays 12-12:50pm

Location: Health Sciences 406

### 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:

MWF 12:00-12:50 Health Science (HS) 207

R 1:00-2:50 Gallagher Building (GBB) L26 (basement)

**CLASS STRUCTURE:** This class is pretty mathy and partially flipped to allow for more time to practice and get help with difficult concepts and practice problems. About one lecture's worth of material a week will be asynchronous online that needs to be completed before class on Monday. Please note, this class is being recorded, and recordings will be available to those who must miss class.

**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	Mon	30	The Big Picture & Reliable Knowledge [Ch. 1, 2]
Sep	Wed	1	Reliable Knowledge [Ch. 2]

	<i>Thurs</i>	2	<i>Lab 1: Intro to R</i>
	<i>Fri</i>	3	Study design [Ch. 2]
	<i>Moodle</i>		<i>Stats Review [Ch. 2]</i>
	<i>Mon</i>	6	<b>No Class, Labor Day</b>
	<i>Wed</i>	8	Likelihood [Ch. 2]
	<i>Thurs</i>	9	<i>Lab 2: Standard Error and Deviation</i>
	<i>Fri</i>	10	AIC [Ch. 2]

	<i>Moodle</i>		<i>Estimating abundance [Ch. 4]</i>
	<i>Mon</i>	13	Estimating abundance [Ch. 4]
	<i>Wed</i>	15	CMR abundance - Lincoln Peterson [Ch. 4]
	<i>Thurs</i>	16	<i>Lab 3: Population Estimation (Lincoln-Peterson)</i>
	<i>Fri</i>	17	Survival [Ch.4]

**Annotated Bibliography Due**

	<i>Moodle</i>		<i>Survival &amp; Reproduction</i>
	<i>Mon</i>	20	Survival [Ch. 4]
	<i>Wed</i>	22	Review for Exam
	<i>Thurs</i>	23	<i>Lab 4: Hypotheses &amp; Predictions</i>
	<i>Fri</i>	24	<b>EXAM I</b>

	<i>Moodle</i>		<i>Exponential Population Growth [Ch. 5]</i>
	<i>Mon</i>	27	Exponential Population Growth [Ch. 5]
	<i>Wed</i>	29	Exponential Population Growth [Ch. 5]
	<i>Thurs</i>	30	<i>Lab 5: Exponential Growth</i>
Oct	<i>Fri</i>	1	Matrix population models [Ch. 6]

**Hypotheses and Predictions for Research Proposal Due**

	<i>Moodle</i>		<i>Matrix population models [Ch. 6]</i>
	<i>Mon</i>	4	Matrix population models [Ch. 6]
	<i>Wed</i>	6	Matrix population models [Ch. 6]
	<i>Thurs</i>	7	<i>Lab 6: Matrix Models I</i>
	<i>Fri</i>	8	Matrix population models [Ch. 6]

	<i>Moodle</i>		<i>Sensitivity Analysis &amp; Variation [Ch. 6]</i>
	<i>Mon</i>	11	Matrix population models [Ch. 6]
	<i>Wed</i>	13	Loggerhead Sea turtle Matrix example
	<i>Thurs</i>	14	<i>Lab 7: Matrix Models II</i>
	<i>Fri</i>	15	Review for Exam

<i>Moodle</i>		<i>Density Dependence [Ch. 7]</i>
Mon	18	<b>EXAM II</b>
Wed	20	Density Dependence [Ch. 7]
<i>Thurs</i>	<i>21</i>	<i>Lab 8: Peer Review</i>
Fri	22	Density Dependence [Ch. 7]

*Moodle* *Density Dependence & Predation [Ch. 7,8]*

Mon 25 Predation [Ch. 8]

**Draft of Hypotheses & Methods Sections**

Wed 27 Predation [Ch. 8]

*Thurs 28 Lab 9: Density Dependence*

Fri 29 Predation [Ch. 8]

<i>Moodle</i>		<i>Disease</i>
Nov Mon	1	Predation [Ch. 8]
Wed	3	Genetic variation & fitness [Ch. 9]
<i>Thurs</i>	<i>4</i>	<i>Lab 10: Writing Lab</i>
Fri	5	Metapopulations & Ecological Traps [Ch. 10]

*Moodle* *Connectivity [Ch. 10]*

Mon 8 Exercises

Wed 10 Review for Exam

*Thurs 11 No Lab, Veteran's Day*

Fri 12 **EXAM III**

*Moodle* *Human perturbations on populations [Ch. 11]*

Mon 15 Invasive Thistle Exercise

Wed 17 Harvest Management [Ch. 14]

*Thurs 18 Lab 11: Small Population Conservation*

Fri 19 Harvest Management [Ch. 14]

**Draft Research Proposal Due**

*Moodle* *Harvest Management [Ch. 14]*

Mon 22 Harvest Management [Ch. 14]

Wed-Fri 24-26 **No Class - Thanksgiving Break**

*Moodle* *Focal Species [Ch. 12]*

Mon 29 Harvest Management 3 [Ch. 14]

**Proposal Reviews Due**

Dec	Wed	1	Harvest exercises
	<i>Thurs</i>	2	<i>Lab 12: Harvest</i>
	Fri	3	Extinction Vortex [Ch. 12]
	Mon	6	Population Viability Analysis [Ch. 12]
	Wed	8	Adaptive Management [Ch. 14]
			<b>Final Research Proposal Due</b>
	<i>Thurs</i>	9	<i>No lab</i>
	Fri	10	Final Exam Review
	<b>Fri</b>	<b>17</b>	<b>Final Exam 8-10am</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	When
Exams	45%	Exam 1	100	Sep-24
		Exam 2	100	Oct-18
		Exam 3	100	Nov-12
		Final	140	Dec-17
subtotal			<b>440</b>	
Labs	23%	12 labs @ 20 pts each (drop lowest)	<b>220</b>	weekly
Online Activities	11%		<b>110</b>	weekly
Proposal	21%	Annotated Bibliography	20	Sep-17
		Hypotheses/Predictions	20	Oct-1
		Draft Sections	30	Oct-25
		Full Draft	10	Nov-19
		Reviews	20	Nov-29
		Final Proposal	100	Dec-8
subtotal			<b>200</b>	
total points	100.0%		<b>970</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, Hypotheses and Predictions (as bullet points), a draft of the Hypothesis Section and the Methods Section, a full draft, anonymous peer-reviews, and the final proposal. See above for grade break-down and due dates. 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. Even if you're vaccinated, there are occasional breakthrough cases, 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.

Please let me know if you have concerns or need 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 classrooms and labs until further notice
- Where maintaining 6 feet between individuals is not possible, specific seating arrangements will be used and attendance noted to support contact tracing efforts
- Follow other UM guidance as it evolves
- Please do not congregate outside the classroom before and after class
- 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
- UM recommends students get a COVID-19 vaccine. Please direct your questions or concerns about vaccines to Curry Health Center
- Up-to-Date COVID-19 Information from the University of Montana
  - UM Coronavirus Website: <https://www.umt.edu/coronavirus>
  - UM COVID-19 Fall 2021 website: <https://www.umt.edu/coronavirus/campus-covid-plan/default.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 the Office for Disability Equity (ODE). If you anticipate or experience barriers based on disability, please contact the ODE at: (406) 243-2243, [ode@umontana.edu](mailto:ode@umontana.edu), or visit [www.umt.edu/disability](http://www.umt.edu/disability) for more information. Retroactive accommodation requests will not be honored, so please, do not delay. As your instructor, I will work with you and the ODE to implement an effective accommodation, and you are welcome to contact me privately if you wish.

**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](mailto: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.

**Beginning the sixteenth (16) instructional day of the semester through the forty-fifth (45) instructional day**, course adds & drops require instructor's and advisor's approvals using the Course Add/Change/Drop link in Cyberbear. 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 must be approved by the dean of the student's major as well as the instructor of the course and the student's advisor. 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).