EAS 507: Interpreting Research in Conservation Ecology (3 Credit Hours)

Instructor- Dr. Karen Alofs

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GSI- Sheila Wald

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Course Description

This course serves as a core course for Masters students in the Conservation Ecology field of study. The course builds broad knowledge on a range of current topics in ecology, earth sciences and conservation. Topics range from citizen science to data integration, from forests to fishes, from genetics to populations, communities and ecosystems. Students will have the opportunity to interact with top scientists in their field and evaluate research at the frontiers of conservation ecology. The course will read and discuss recent papers and examine how science is communicated in public seminars. The course examines how research is shared, collaborations are developed and how the cross-pollination of ideas between labs, universities and practitioners improves conservation. This course will prepare students to assess the state of knowledge on applied topics, to identify gaps and evaluate recent developments and to translate science to audiences. These practices are continually refined in both academic and non-academic careers in our field.

Course Objectives

1. Evaluate the current state of knowledge on a broad range of topics within ecology and conservation.
2. Compare research approaches including theoretical and empirical investigations and varied study designs and analytical approaches.
3. Develop approaches for evaluating and sharing scientific methods and findings through written and oral communication.
4. Assess methods for interacting with research within and across disciplines, for both academia and practice.
5. Engage with a research community, developing networks and collaborations, integrating perspectives, and developing future research directions.

Core Competencies

- Acquiring disciplinary knowledge (conservation ecology, earth sciences, emerging research)
- Understanding historical antecedents of current & future situations (recognizing foundations and evolution of topical knowledge)
- Asking relevant questions & defining problems (e.g., research design, scoping)
- Evaluating scientific, policy, & other arguments/literature based on evidence and validity
- Communicating and translating (e.g., written, verbal, visual, useable science)

Meeting times

Class Section – Monday 3-4 pm, Dana 1040
Discussion Sections– one per week, according to registration

- Tuesday 9-10 am, Dana 3038
- Thursday 9-10 am, Dana 3038
- Thursday 11:30-12:30, Dana 3038

Lunch with Seminar Speaker (once per semester)- Friday 12-1pm, Dana 3552
Public Seminar- Friday 3-4pm, Dana 1040

Course Schedule

Date	Topic	Speaker
	COURSE INTRO	
Friday, Jan 10th	Introduction and Course Logistics, Initial Literature Assessment	
Monday, Jan 13th	Tools for Interpreting Literature and Seminars *Sign up for presentation and lunch dates*	
Discussion	**Reading:** Reid et al. 2019. Emerging threats and persistent conservation challenges for freshwater biodiversity. *Biological Reviews* 94: 849-873	
Friday, Jan 17th	**Seminar:** Lightning Talks by ConEco Faculty	Alofs, Ibanez, Foufopoulos, Beletsky, Gronewold, Godwin
Monday, Jan 20th	Martin Luther King Jr. Day (Holiday)	
	GENETICS AND MOLECULAR ECOLOGY	
Discussion	**Reading:** Green and Kronforst. 2019. Monarch butterflies use an environmentally sensitive, internal timer to control overwintering dynamics. *Molecular Ecology* 28:3642-3655.	
Friday, Jan 24th	**Seminar:** A role for developmental/genetic mechanisms in monarch butterfly conservation considerations	Delbert André Green II, Assistant Professor, University of Michigan, Ecology and Evolutionary Biology
Monday, Jan 27th	**Presentations**	
	PHENOLOGY AND CLIMATE CHANGE	
Discussion	**Reading:** Zimova et al. 2019. Local climate determines camouflage mismatch in snowshoe hares. *Global Ecology and Biogeography* 00:1-13	
Friday, Jan 31st	**Seminar:** Understanding the potential of wild populations to adapt to climate change: Lessons from color molting mammals	Marketa Zimova, Postdoctoral Associate, University of Michigan School for Environment and Sustainability
Monday, Feb 3rd	**Presentations**	
	ECOHYDROLOGY	
Discussion	**Reading:** Schriever et al. 2015. Hydrology shapes taxonomic and functional structure of desert stream invertebrate communities. *Freshwater Science*. 34(2): 399-409.	

Friday, Feb 7th	**Seminar:** The Importance of Coastal Wetlands in Generating Unique Biodiversity and Conservation Opportunities	Tiffany Schriever, Western Michigan University
Mon Feb 10th	**Presentations**	
TERRESTRIAL LANDSCAPE ECOLOGY		
Discussion	**Reading:** Scheller et al. 2019. A landscape model of variable social-ecological fire regimes. *Ecological Modelling* 401:85-93.	
Friday, Feb 14th	**Seminar:** Managing Landscapes for Change: Conservation Challenges for the Next Century.	Robert Scheller, North Carolina State University
Monday, Feb 17rd	**Presentations**	
TROPHIC INTERACTIONS		
Discussion	**Reading:** Bunnell et al. 2014. Changing ecosystem dynamics in the Laurentian Great Lakes: Bottom-up and top-down regulation. *BioScience* 64: 26-39.	
Friday, Feb 21st	**Seminar:** Oligotrophication in Lakes Michigan and Huron and potential effects on fisheries	David "Bo" Bunnell, USGS Great Lakes Science Center
Monday, Feb 24rd	**Presentations**	
Discussion	**Reading: No Discussion**	
Friday, Feb 28th	--*Consider attending an outside seminar this week*--	No Seminar
WINTER BREAK		
Monday, March 9th	*Engagement with research in different careers*	
FRESHWATER LANDSCAPE ECOLOGY		
Discussion	**Reading:** Cooper et al. 2019. Protected areas lacking for many common fluvial fishes of the conterminous USA. *Diversity and Distributions* 25: 1289-1303.	
Friday, March 13th	**Seminar:** Applications of the Landscape Approach for Conserving Stream Fishes from Current and Future Threats	Dana Infante, Michigan State University
Monday, Mar 16rd	**Presentations**	
BIOCULTURAL APPROACHES		
Discussion	**Reading:** Sterling et al. 2017. Biocultural approaches to well-being and sustainability indicators across scales. *Nature Ecology & Evolution*	
Friday, March 20th	**Seminar:** Biocultural Approaches to Resource Management: Community-Researcher Collaborations	Eleanor Sterling, American Museum of Natural History
Monday, Mar 23rd	**Presentations**	
ECOSYSTEM SERVICES		
Discussion	**Reading:** Gomes et al. 2019. Computational sustainability: Computing for a better world and a sustainable future. *Communications of the ACM* 9:56-65.	
Friday, March 27th	**Seminar:** Migratory fish, dams, and ecosystem service tradeoffs in tropical river systems	Alex Flecker, Cornell University

Monday, Mar 30th	**Presentations**	
BIODIVERSITY-STABILITY		
Discussion	**Reading:** TBD	
Friday, April 3rd	**Seminar:** TBD - *species loss and ecosystem function*	Diane Srivastava, University of British Columbia
Monday, April 6th	**Presentations**	
AGROECOLOGY AND BIODIVERSITY		
Discussion	**Reading:** Landis. 2017. Designing agricultural landscapes for biodiversity-based ecosystem services. *Basic and Applied Ecology* 18: 1-12.	
Friday, April 10th	**Seminar:** Conserving Biodiversity in Intensified Agricultural Landscapes	Doug Landis, Michigan State University
Monday, April 13th	**Presentations**	
COURSE WRAP-UP		
Discussion	*Applications of the Primary Literature- Sheila Wald*	
Friday, April 17th	SEAS Capstone Conference – *Speaker Nominations Due*	No Seminar
Monday, April 20th	*Course Wrap-up, Final Literature Assessment*	

Grading

Attendance & Participation (**15%**)
Seminar Insights (**10%**)
Lightning talk on seminar topic (**15%**)
Questions for discussion (submitted by Monday evening each week; **25%**)
Lunch participation (**10%**)
Nomination of a speaker (**10%**)
Initial Literature Assessment Exercise (**5%**)
Final Literature Assessment Exercise (**5%**)
Final Literature Assessment Reflection (**5%**) – Due Thursday April 30th 8AM
Written perspective on outside seminar (another unit on campus or agency webinar; Extra Credit **10%**)

Monday Class

This part of the class will begin with an overview of the course goals and expectations and an introduction to the types and components of research seminars and research papers. This will transition into an examination of the state of knowledge in the topic of the weekly seminar. Each week students will present lightening talks related to the seminar topic from the previous week.

Student lightning talks will relate to the topic of the previous week's seminar and can focus on:

- Summarizing the implications of a recent (published within the last 18 months) study for management
- Outlining the state of knowledge and outstanding research needs to address conservation needs within the research topic

Lightening talks are limited to 5 minutes in length and 5 content slides + title and question/citation slide. Slides must be shared by ***submitting a file or google slides link in Canvas by 11:59pm on the Thursday evening before the talk will be presented***.

Seminar insights

There are ten invited seminars throughout the semester (excluding lightning talks by faculty). For each of these seminars students will submit, through Canvas, a short comment on insight they gained from attending the seminar. These may be insights related to presentation style, study design, or topical knowledge, etc. They should be thoughtful reflections that also demonstrate engagement with the seminar. These are due by ***11:59pm on the Sunday following the seminar.***

Discussions of primary literature

One-hour discussions with smaller sections will be led by the course GSI. These will be discussions of recent publications by each week's invited seminar speaker. Papers for discussion will be posted on Canvas. As students read, they should consider:

- Where does the research fit within the broader field or what needs does it addresses?
- What were the goals of the study and were the methods used effective?
- What assumptions do the researchers make and do you agree with these?
- How can this research be applied in conservation and management?
- What follow-up studies would be appropriate?
- How does this relate to your own research or career interests?

Students will ***submit a question or comment about the paper on Canvas (by 8:00 pm Monday each week)***. Questions can be concept or methods based, they may be clarifying or inquisitive. Comments should include some insight gained from reading the paper or thoughts on what may have been effective or could have been improved. These questions/comments will be compiled by the GSI. They should prompt further understanding or broader discussion. Students should come to discussions having thoroughly read the papers, submitted discussion questions/comments and feeling prepared to share additional thoughts.

Literature Assessment

Students will receive a prompt on the first and last day of class and have a period of time in class to conduct a brief survey of the literature and submit a summary of their findings through Canvas. They will also submit a reflection on their literature assessment ***by Thursday April 30th 8 am (the scheduled final exam period).***

Written perspective on outside seminar or lecture (Extra Credit)

Once during the semester students will attend an outside seminar or lecture, either in another unit on campus or an agency webinar. ***Within a week of that seminar*** students will submit a two page perspective. This essay should summarize the research presented and the context of this research in a wider field. It should also comment on differences in seminar format or approaches to communicating with the target audience. ***The latest this can be turned in is Friday, April 17th.***

Here are a few seminar series that should be considered, additional suggestions are welcome:
EEB Thursday Seminar – 4-5pm Thursday BSB 1060
EEB Lunch Seminar – 12-1pm Tuesday BSB 1010
EES Smith Lecture 3:30-4:30 Friday Room 1528 1100 North University Building- this conflicts with the Con Eco Seminar, but will be approved by the instructor based on topical interest
Food Literacy for All – Tuesday 6:30 – 8pm Angell Hall Auditorium B (Registration required)
CIGLR- Varied times, web registration and attendance possible https://ciglr.seas.umich.edu/events/

Lunch Participation

We will host an informal lunch discussion with each of the invited seminar speakers. Each student should sign up to attend one of these lunches during the semester, additional spots will be held for students in the faculty host's lab or working on related topics (but not in the course). **If you have dietary restrictions please send them by email, including the date of the lunch you will attend, to the GSI by January 17th.**

Nomination of a seminar speaker for next year

Each student will nominate a researcher for next year's Conservation Ecology seminar. Nominations (one page in length) should include a summary of the researcher's current position and research interests, a one paragraph description of a recent research publication, and a justification of how the speaker's seminar would be valuable to ConEco students. These nominations will be evaluated and compiled by the course instructor and GSI and students will vote to select the top 5 candidates. ***Nominations are due Friday April 10th***

Suggested texts as resources (posted in Canvas files)

Sodhi N.S. and PR. Ehrlich. Conservation Biology for All. Oxford University Press, Oxford UK. 2009. pp. 344. https://conbio.org/publications/free-textbook/

Sutherland, W.J., Dicks, L.V., Ockendon, N., Petrovan, S.O., and Smith, R.K. What Works in Conservation 2019. Cambridge, UK: Open Book Publishers, 2019. https://www.conservationevidence.com/

Mental Health and Student Well-Being During their academic careers, students experience stressors and issues ranging from academic concerns to personal crises (including, but not limited to: alcohol/drug use, anxiety, depression, difficulty eating/sleeping, family worries, loss/grief, sexual assault, or strained relationships). These mental health concerns and/or personal events may affect your well-being and lead to diminished academic performance and ability to fully engage with those around you. If the source of your stressors is academic, please approach us so that we can find solutions together. In order to support you with personal struggles, the University of Michigan offers a number of resources to all enrolled students, including:

- Counseling and Psychological Services (CAPS) – 734-764-8312
    - CAPS offers After-Hours Urgent Support – 734-764-8312 (press "0" to speak to a licensed mental health professional)
- Dean of Students Office – 734-764-7420, deanofstudents@umich.edu
- Services for Students with Disabilities (SSD) – 734-763-3000, ssdoffice@umich.edu
- Sexual Assault Prevention and Awareness Center (SAPAC) – 734-764-7771
    - 24 hour crisis line – 734-936-3333
- University Health Service (UHS) – 734-764-8320, contactuhs@umich.edu
    - UHS provides nurse advice by phone, day or night – 734-764-8320
- Well-being Canvas site
    - Houses comprehensive list of campus resources for well-being
- Wolverine Wellness – 734-763-1320, contactuhs@umich.edu

A more comprehensive list of resources can be found here: tiny.cc/distresssignals

Seeking help is a courageous thing to do for yourself and those who care about you.

Accommodations for Students with Disabilities Please contact us if you require accommodation to support your learning in this course due to the impact of a disability, visible or non-visible. Solutions that benefit one student can sometimes benefit the class as a whole. If you have already established accommodations with Services for Students with Disabilities (SSD) regarding your needs, please let us know what your required accommodations are at your earliest convenience so we can work together to meet your needs in this course. If you have not yet established accommodations through SSD and you have a temporary or permanent condition that requires accommodation, please contact SSD as soon as possible. Accommodations can vary to meet students' needs, including – but not limited to – those related to attention, hearing, learning, medical, mental health, mobility, or vision.

Religious or Cultural Observances and Other Needs This class observes university-defined holidays. However, there may be other days of more significance to you than those designated by the university. Please inform us as soon as possible via email if a class day or assignment due date conflicts with your observance of a holiday so that we can work with you to accommodate your needs. If there are any other needs that you have to support your learning in this course, please also bring these to my attention as soon as possible so that we can work together to ensure your success in the course.