

# Applied Community and Ecosystem Ecology

## FW321

<b>Instructor</b>	Dr. Dana Warren dana.warren@oregonstate.edu
<b>Office Hours</b>	<i>D. Warren:</i> Wednesdays 10:00 – 12:00 and by appointment (212 Richardson Hall)
<b>Class Schedule</b>	Lecture: T/R 10:00 – 11:20
<b>Prerequisites</b>	BI 370, FW320 ( <i>note: FW320 can be taken concurrently</i> )
<b>Course web site</b>	Canvas FW321
<b>Required Readings</b>	(1) Morin, Peter J., Community Ecology, Second Edition, Blackwell Science, Inc. 2011. ISBN 0-86542-350-4 (2) Additional readings posted on class Canvas site

### Course Description:

The goal of this course is to develop a strong understanding of the linkages between community and ecosystem ecology and applied management strategies. The effective management of wildlife and fisheries populations is dependent on the understanding of how populations fit into the broader ecology of the landscape. We will expand upon theoretical concepts introduced in General Ecology (BI 370) and Population Dynamics (FW 320), such as metapopulation theory and invasion biology, and relate them to real world applications, such as reserve design and harvest management. It is essential that future ecologists and managers be taught community and ecosystem theory and the management strategies and techniques borne from them. Only then can we accurately and appropriately evaluate ecosystem service benefits and costs.

### Student Learning Outcomes:

- Students will be taught using a combination of class lecture, small group work, and primary literature discussion.
- Critical Thinking Skills:
  - Apply community and ecosystem theory to current management practices
  - Evaluate the loss of ecosystem services across temporal and spatial scales
  - Understand the challenges associated with predicting management impacts over time and across trophic levels
  - Recognize the constraints in applying ecological concepts to real-world scenarios
  - Evaluate and interpret how changing nutrients, climate or water transport influence watershed properties and ecosystem services.
  - Construct a long-term conservation plan
  - Assess attempts at ecosystem valuation and the long-term impacts of human activities.
- Leadership and Team Building Skills:
  - Improve group communication skills through small group break-out discussions and activities.

## Lecture Outline

No.   Date                                      Lecture Topic                                      Reading

### Week 1

1.   April 3       - Introduction  
                      - Applied Ecology – Constraints and Uses                                      NA
2.   April 5       - Ecosystem ecology overview – pools, fluxes, and mass balance                                      Chapin et al. Chapter 1

*Select ecosystem for paragraph assignments by Sunday, April 8 @ 11:59 PM*

### Week 2

3.   April 10      - Primary production I (GPP, NPP, Bottom-up drivers of PP, global, regional and local factors affecting PP)                                      Weathers et al. Chapter 2
4.   April 12      - Primary production II  
                      - Nutrient Cycling I: (P – Cycle and why it matters and how we have altered it; N – cycle and why it matters and how we have altered it)                                      Schimel Chapters 1 & 11

### Week 3

5.   April 17      - Nutrient Cycling II  
                      - Carbon cycle I                                      Vitousek et al. 1997
6.   April 19      - Community ecology overview;  
                      - Biodiversity, why it matters (or doesn't. . .), and how you measure it. **- GUEST LECTURE**                                      Morin Ch. 1

*Ecosystem paragraphs for lectures 3, 4, 5, 6 - due Sunday, April 22 @ 11:59 PM*

### Week 4

7.   April 24      - Carbon cycle II  
                      - Global warming                                      2013 IPCC report for policy makers
- April 26      **Exam 1 (on lectures 1-5, 7)**

### Week 5

8. May 1 - Niche theory and biological control Morin Ch. 2  
(Ch. 5 optional)
9. May 3 - Invasive species

### Week 6

10. May 8 - Landscape development from a community perspective (succession);  
- Predation Morin Ch. 13  
Morin Ch. 4
11. May 10 - Competition and species interaction formulas. Morin Ch. 3

*Ecosystem paragraphs for lectures 7, 8, 9, 10, 11, - due Sunday, May 13 @ 11:59 PM*

### Week 7

12. May 15 - Food webs – determining, quantifying, indirect effects, energy transfer, cascades, etc Morin Ch. 6
13. May 17 - Top-down controls and trophic cascades

### Week 8

- May 22 **Exam 2 (Lectures 7-13)**
14. May 24 - Dispersal and Migration Morin Ch. 11  
- Isotopes

### Week 9

15. May 29 - Phenology Morin Ch. 10  
- Ecological Traps - Schlaepfer et al. 2000
16. May 31 - Alternative steady states Reyers et al. 2013  
- Reserve Design Lindenmayer et al. 2008  
(Optional – Morin Ch. 14)

*Ecosystem paragraphs for lectures 12, 13, 14, 15, 16 - due Sun., June 3 @ 11:59 PM*

**Week 10  
(dead week)**

17. June 5 - Food Web Applications: Destabilization and top-down controls. Estes et al. 2011  
 - Biogeography Applications: Agency Collaboration
18. June 7 - Ecosystem management; Adaptive Management Conroy and Peterson 2006  
 Runge 2011

**Finals Week**

June 11 - 15 Finals Week exam time TBD

**Assignments, Quizzes, and Exams**

- 1) **Quizzes:** We will give a total of 7 quizzes over the course of the quarter (about 1 per week on non-exam weeks but they will be administered irregularly). They will be short assessments of the reading for that day and/or basic concepts from previous lectures.
- 2) **Exams:** We will have 2 mid-terms and a final. The Mid-terms will cover only the information presented in the previous section (i.e. mid-term 2 will have no ecosystem ecology in it). The final will focus primary on information from the last part of the course but will include a few questions from earlier lectures.
- 3) **Ecosystem assessment:** In week 1 you will pick an ecosystem and over the course of the term, you will build your knowledge of that ecosystem based on lecture material (and outside reading) – see additional handout for details.

**Grading**

**Point values for each graded component of the course:**

<i>Quizzes: best 6 of 7 count (10 pts each for a total of 60 pts)</i>	60	14%
<i>Mid-term Exam I, (100 points) –April 26</i>	100	23.25%
<i>Mid-term Exam II, (100 points) – May 22</i>	100	23.25%
<i>Final Exam, (100 points) - TBD (exam week sometime)</i>	75	17.5%
<i>Ecosystem Paragraphs</i>	94	22%
<i>Ecosystem selection and general description (DUE April 8)</i>	10	2%
<i>Ecosystem assessment I (lectures 3-6 DUE April 22) (6 pts per ¶)</i>	24	6%
<i>Ecosystem assessment II (lectures 7-11 DUE May 13) (6 pts per ¶)</i>	30	7%
<i>Ecosystem assessment III (lectures 12-16 DUE June 3) (6 pts per ¶)</i>	30	7%
<b>Total:</b>	454	100%

<i>Extra credit - add dropped quiz score to final total points for up to +2%</i>		
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**Grading Scale:**

Grades are based on the percentage of maximum points (454) accumulated over the term and assigned according to the following table:

<b>A</b>	(421 ≤ x)	92.7 - 100%
<b>A-</b>	(408 ≤ x ≤ 420)	89.9 – 92.5%
<b>B+</b>	(399 ≤ x ≤ 407)	87.9 – 89.6%
<b>B</b>	(375 ≤ x ≤ 398)	82.6 – 87.6%
<b>B-</b>	(363 ≤ x ≤ 374)	80.0 – 82.3%
<b>C+</b>	(353 ≤ x ≤ 362)	77.7 – 79.7%
<b>C</b>	(330 ≤ x ≤ 352)	72.7 – 77.5%
<b>C-</b>	(315 ≤ x ≤ 329)	69.4 – 72.5%
<b>D+</b>	(308 ≤ x ≤ 314)	67.8 – 69.1%
<b>D</b>	(282 ≤ x ≤ 307)	62.1 – 67.6%
<b>D-</b>	(271 ≤ x ≤ 291)	59.7 – 61.8%
<b>F</b>	(x < 271)	< 59.7%

**Incomplete grades:**

A grade of incomplete will only be assigned for students who are unable to complete the course due to serious illness or injury. Students are responsible for understanding and following all university and departmental policies that apply to removing a grade of incomplete from their record, and for understanding the circumstance that can cause an incomplete grade to convert to a grade of F.

## Course and College Policies

**Attendance:**

Poor attendance is often the cause for poor grades. Please attend all lectures and laboratory sessions.

**Readings:**

Students should prepare for lecture by reading the relevant chapter in the textbook or the primary literature for that lecture which will be provided well ahead of time on the course website.

**Tardiness:**

I intend to start classes on time. Arriving late disturbs other students already present and disrupts the learning process. Please be considerate and plan to be on time.

**Cell phones:**

Please remember to turn off audible cell phones and pagers during class. Repeated issues of cell phone problems will be treated on a case-by-case basis. Regular or continued disruption of the class after two warnings will affect your grade.

**Students with Disabilities:**

Accommodations are collaborative efforts between students, faculty and Disability Access Services (DAS). Students with accommodations approved through DAS are responsible for contacting the faculty member in charge of the course prior to or during the first week of the term to discuss accommodations. Students who believe they are eligible for accommodations but who have not yet obtained approval through DAS should contact DAS immediately.

**Diversity, Equity, and Inclusion:**

As a course focused on community and ecosystem ecology, this class may seem to operate outside issues of diversity equity and inclusion; and in an ideal world, science would indeed be entirely and unequivocally objective. However, much of science can be subjective, and scientific fields have been historically built on a small subset of privileged voices. Therefore, even though the material in this course is primarily of a scientific nature, I acknowledge that it is possible there may be both overt and covert biases in the material due to the lens with which it was written. Ultimately, integrating a diverse set of experiences is important as we advance our field and develop a more comprehensive understanding of ecology.

Within this classroom and in all classroom interactions, respect for each other and for our occasionally differing viewpoints is essential. While people may disagree, an absolute requirement in this course is to treat each other with empathy, dignity and respect. It is important that we create a learning environment in which everyone feels safe and respected (which in-turn increases everyone's potential to learn). I, like many people, am still in the process of learning about diverse perspectives and identities. I will work to be as forthright and respectful as possible in considering a diversity of perspectives and identities, and I ask that you do so as well. We will work *together* create an inclusive learning environment. This means holding each other, including me, accountable to this commitment. If something is said in class (by anyone) that makes you feel uncomfortable, please talk to me about it, or if you are more comfortable remaining anonymous, you may provide feedback by contacting staff at OSU Institutional Diversity office (<http://leadership.oregonstate.edu/diversity>), at the OSU Equal Opportunity and Access office (<http://eoa.oregonstate.edu/>), or at the OSU Diversity and Cultural Engagement program (<http://dce.oregonstate.edu/>). I believe the learning environment should honor your identities (including race, gender, class, sexuality, religion, ability, etc.). To help accomplish this, if you have a name and/or set of pronouns that differ from those that appear in your official OSU records, please let me know.

**University Code of Conduct and Academic Honesty:**

Please follow the College rules on conduct and honesty. These can be found at (<http://ecampus.oregonstate.edu/services/policies/conduct.htm>). Cheating or plagiarism by students is subject to the disciplinary process outlined in the Student Conduct Regulations. Students are

expected to be honest and ethical in their academic work. Academic dishonesty is defined as an intentional act of deception in one of the following areas:

- **CHEATING** - use or attempted use of unauthorized materials, information or study aids or an act of deceit by which a student attempts to misrepresent mastery of academic effort or information. This includes unauthorized copying or collaboration on a test or assignment or using prohibited materials and texts.
- **FABRICATION** - falsification or invention of any information (including falsifying research, inventing or exaggerating data and listing incorrect or fictitious references.
- **ASSISTING** - helping another commit an act of academic dishonesty. This includes paying or bribing someone to acquire a test or assignment, changing someone's grades or academic records, or taking a test/doing an assignment for someone else (or allowing someone to do these things for you). It is a violation of Oregon state law to create and offer to sell part or all of an education assignment to another person (ORS 165.114).
- **TAMPERING** - altering or interfering with evaluation instruments and documents.
- **PLAGIARISM** - representing the word or ideas of another person as one's own OR presenting someone else's words, ideas, artistry or data as one's own. This includes copying another person's work (including unpublished material) without appropriate referencing, presenting someone else's opinions and theories as one's own, or working jointly on a project, then submitting it as one's own.

Behaviors disruptive to the learning environment will not be tolerated and will be referred to the Office of Student Conduct for disciplinary action.