Field Ecology Workshop
Environmental Studies 375, Summer 2015

Instructor
Dr. Alison Duff
ajduff@wisc.edu

Schedule
Jun 15th – July 8th
Mon-Tues-Wed, 9 am – 4 pm
110 Science Hall/field sites

Office hours:
Thursdays, 12-1 pm (online)
Or, by appointment

Course Description
The main objective of this course is to provide students with an introduction to the science and practice of ecological field data collection. Course content will include a mix of lecture material and readings covering introductory experimental design, data collection techniques, and data analyses; field trips featuring guest ecologists and the ecosystems and species they study; and group projects that will allow students to practice their data collection and analysis skills.

Given the time constraints of the course and the reality of working as field ecologists, students are expected to work in a range of environmental conditions. All students should expect to wear long pants, closed-toe shoes (no sandals), hats, sunscreen and mosquito repellent each day of the course. Proper clothing is your best defense against sunburn, poison ivy, and mosquitoes!

There is no required text, although assigned readings and other materials will be posted on Learn@UW. Students will be expected to adjust their schedules so they can participate in field protocols which require early morning or evening data collection, although accommodations can be made for students with extenuating circumstances.

Course Approach
Field Ecology includes study of a wide range of organisms, and given the time constraints of the course, we must necessarily focus on only a handful of taxa and techniques. The course units (review the Course Schedule for details) have been developed so you can experience the variety in field protocols and equipment that are used to assess different segments of our local biological diversity. I have made a special effort to connect our course units with real citizen science opportunities, so that you can continue your study as volunteers if you choose. Over the four weeks of the course, you will have the opportunity to work with a number of accomplished and enthusiastic field ecologists, and experience the challenges and enjoyment they face in their work. I encourage you to take advantage of these interactions to learn as much as possible from our guests, and to make professional contacts if you are interested in pursuing a career as a field ecologist. Most importantly, I ask that you bring a good attitude and come to each course session prepared to learn and discuss the practice of field ecology. To that end, I have made a special effort to develop our Learn@UW course website to include a number of Supplementary Materials – videos, required and optional readings, and audio clips – that will complement the field and lecture components of the course.
Assignments & Grading

<table>
<thead>
<tr>
<th>Assignment</th>
<th>Points Awarded</th>
<th>Due Date(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unit 1 Field Report</td>
<td>30</td>
<td>June 21, 11:59 pm</td>
</tr>
<tr>
<td>Unit 2 Field Report</td>
<td>30</td>
<td>June 28, 11:59 pm</td>
</tr>
<tr>
<td>Unit 3 Field Report</td>
<td>30</td>
<td>July 5, 11:59 pm</td>
</tr>
<tr>
<td>Unit 4 Field Report</td>
<td>30</td>
<td>July 12, 11:59 pm</td>
</tr>
<tr>
<td>Unit Quizzes (4 x 5 points each)</td>
<td>20</td>
<td>Wednesdays, 11:59 pm</td>
</tr>
</tbody>
</table>

*Total Course Points 160*

*Participation points will include an overall assessment of your contribution to the course discussion (classroom & field), and completion of readings and quizzes (5 pts/unit).

Assignment Descriptions

**Rubrics for each assignment category on last pages of syllabus**

**Course Participation** 20 points

We only have 4 weeks together, and in order to meet the Learning Objectives for each unit, we need to work together to create lively discussion. This requires that you prepare for each unit by completing the Reading Assignments before the first day of each unit, engage our guest ecologists by asking them challenging questions, and use any posted Supplementary Materials to improve your understanding of the course content or assignments. You may receive up to 5 participation points for each unit, based on your completion of readings and quizzes, and your participation in discussions. I understand that not everyone is comfortable speaking up in class, and for those who may find this difficult, you are welcome to submit your thoughts via the Discussion link under the Communications tab on the Learn@UW course site. I will be sure to integrate the online and in-class discussions so we can all get the most out of these exchanges.

**Unit Quizzes** 5 points each

The reason I have included unit quizzes through the course Learn@UW page is, in part, to evaluate if we are meeting the Learning Objectives for each unit. This helps me to understand if any of you are struggling with the content, and to respond quickly so you can gain as much as possible from the course material. The quizzes are intended to be brief and measure your understanding of the key concepts identified in the unit Learning Objectives (listed on Learn@UW for each unit on the Content page). **You must log in to Learn@UW to complete the quizzes, and they are due by 11:59 pm on the Wednesday of that unit’s week.**
Unit Field Reports 30 points each

Each week you will work in small groups to complete a field report related to the research protocols and study organisms discussed in the unit. In most cases, we will be working with example data sets, as we are unlikely to be able to gather sufficient data during the unit week for meaningful analyses. I will be sure to build in enough lab time each week so that we can discuss how we should organize our data, choose appropriate analyses, and begin to set up your group field report. Expect to work in a different group each week.

Each of the Unit Field Reports should contain the following sections:
- Title
- Authors (all group members)
- Abstract
- Introduction
- Methods
- Results (including 1-3 figures or tables)
- Discussion
- Literature Cited
- Peer Review Form

Please review the handout WritingScientificPapers.pdf that I have posted on Learn@UW under the Readings and Supplementary Materials tab on the Content page. This document was created by Dr. Matt Ayres at Dartmouth College, and is an excellent summary of the important elements of scientific writing. (Note that we do not have a TA for the course, so replace “TA” with “Alison” in your reading of the document.)

The reports should get easier each week, as you understand how to gather information and communicate it efficiently. I am here to help, so please let me know if your group is struggling with any part of the report process. I will set aside a half day during the first week to go through the important best practices of scientific writing and ecological data analysis. This is an introductory course, so we won’t get into any complex statistical analyses. The Unit Field Reports are due by 11:59 pm on the Sunday following that unit’s week. Only one report submission is required per group in the Learn@UW dropbox folder, but each student will need to submit one Peer Review Form per week into the dropbox folder.
Course Schedule

*** Unit Quizzes are due on Wednesday. Unit Field Reports on the following Sunday***
Activities in gray boxes are optional, but students must participate in at least one

Unit 1: **Pollinator** Monitoring

June 15  
*Meet in room 110 Science Hall at 9 am*
Introductions, syllabus, & course learning objectives
What is Field Ecology?
*Pollinator monitoring protocol in Biocore Prairie at 12 pm*
Guest ecologist: Jeremy Hemberger, graduate student, Entomology
Discussion: pollinator ecology & assigned readings
Review Unit 1 Readings & Supplementary Materials

June 16  
*Meet in room 147 Russell Labs at 9 am*
Guest ecologist: Jeremy Hemberger, graduate student, Entomology
Pollinator identification in the lab
Lunch break
*Return to room 110 Science Hall*
Introduction to ecological data analyses
Introduction to the pollinator data set

June 17  
*Meet in room 110 Science Hall at 9 am*
Introduction to scientific writing
Discussion: Creating a field report
Group work: Unit 1 Field Report
**Unit 1 Quiz:** Due June 17th, 11:59 pm (Learn@UW course page)
**Unit 1 Field Report:** Due June 21st, 11:59 pm (Learn@UW course dropbox)

Unit 2: **Small Mammal** Monitoring

June 22  
*Meet in the Biocore Prairie at 9 am*
Guest ecologist: Marcus Mueller, graduate student, Forest and Wildlife Ecology
Introduction to small mammal communities
Small mammal identification, handling, and data collection
Lunch break
Protocol experimental design and set up
In-field discussion: predictions and questions
Trap checking, depending on conditions
Adjourn early**
Review Unit 2 Readings & Supplementary Materials

**Sign up for evening and/or early morning monitoring activities**

*Evening:* Trap checking, setting and field notes in Biocore Prairie
June 23

**Early am:** Trap checking, data recording in Biocore Prairie
Trap setting, OR take down, clean equipment

*Meet in the Biocore Prairie at 9 am*

Guest ecologist: Marcus Mueller, graduate student, Forest and Wildlife Ecology
Studying mammal communities
- Best practices
- Equipment and techniques
- Landscape heterogeneity and habitat quality

Short-term vs long-term studies
Trap checking, depending on conditions
Adjourn early**

**Evening:** Trap checking, setting and field notes in Biocore Prairie

June 24

**Early am:** Trap checking, data recording in Biocore Prairie
Take down, clean equipment

*Meet in room 110 Science Hall at 9 am*

Discussion: observations and questions, readings
Introduction to the small mammal dataset
Group work: Unit 2 Field Report

**Unit 2 Quiz:** Due June 24\(^{th}\), 11:59 pm (Learn@UW course page)

**Unit 2 Field Report:** Due June 28\(^{th}\), 11:59 pm (Learn@UW course dropbox)

**Unit 3: Vegetation Monitoring**

June 29

*Meet in room 110 Science Hall at 9am*
Vegetation as an indicator of biological diversity
Introduction to plant identification
*Vegetation monitoring in Wingra Oak Savanna*
Guest ecologist: Dr. Brad Herrick, UW-Arboretum Ecologist
Baseline monitoring and adaptive ecological restoration
Discuss and set up the vegetation monitoring protocol

**Review Unit 3 Readings & Supplementary Materials**

June 30

*Meet at Wingra Oak Savanna at 9 am*
Vegetation monitoring protocol

July 1

*Meet at Wingra Oak Savanna at 9 am*
Complete vegetation monitoring protocol
*Return to room 110 Science Hall*
Working with the vegetation dataset
Group work: Unit 3 Field Report

**Unit 3 Quiz:** Due July 1\(^{st}\), 11:59 pm (Learn@UW course page)

**Unit 3 Field Report:** Due July 5\(^{th}\), 11:59 pm (Learn@UW course dropbox)
Unit 4: **Bird Monitoring**

**July 6**  
*Meet in Biocore Prairie at 7 am*

Guest ecologists: Mara McDonald (UW-Madison), Matt Hayes & Andy Gossens, (International Crane Foundation)

Long-term bird monitoring in Biocore Prairie
- Mist-netting: demonstration & discussion
- Overview of common techniques used to study songbird communities

Take down mist nets
- Summary of data trends at Biocore Prairie
- Song Sparrow and Common Yellowthroat research

Sandhill Crane research
- Population monitoring
- Animal behavior studies
- Introduction to the field equipment
- Animal telemetry: radio tracking exercise

*Return to room 110 Science Hall*

Introduction to the bird dataset

Group work: Begin Unit 4 Field Report

**Review Unit 4 Readings & Supplementary Materials**

**July 7**  
*Meet in Science Hall parking lot at 6:30 am*

Arrive at Mazomanie Oak Barrens: Breeding Bird Atlas protocol

Guest ecologist: Mike Mossman, Wisconsin DNR

Return to campus by **1 pm**

**July 8**  
*Meet in room 110 Science Hall at 9 am*

Hike and discussion in Lakeshore Nature Preserve
- Vegetation structure impacts on bird communities
- Adaptive management applied to bird conservation
- Assigned readings: questions and observations

*Return to room 110 Science Hall*

Lunch & course summary presentation

Group work: Unit 4 Field Report

**Unit 4 Quiz:** Due July 8th, 11:59 pm (Learn@UW course page)

**Unit 4 Field Report:** Due July 12th, 11:59 pm (Learn@UW course dropbox)
Assignment Rubrics

RUBRIC: Unit Field Reports

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Poor</th>
<th>Fair</th>
<th>Excellent</th>
<th>Potential Points</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Field Report Content (Group)</strong></td>
<td>0-4: Two or more sections are missing or seriously flawed, hypothesis is illogical, and/or conclusions do not relate to the hypothesis or analyses</td>
<td>5-7: One section missing or unclear, or report includes irrelevant background material, disconnects between sections, and/or unclear hypothesis and conclusions</td>
<td>8-10: All sections are present and logical, hypothesis is clearly stated and related directly to the analyses and conclusions, and the report provides a sound rationale for the study and analyses, with only minor errors</td>
<td>10</td>
</tr>
<tr>
<td>All required sections are included</td>
<td>Conclusions are appropriate based on the analyses, and link clearly to the introduction and hypothesis</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clear, focused hypothesis/hypotheses</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Relevant background content</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Concise, correct methods</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Citations are included for all source material</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Noticeable lack of grammatical editing, source material is not cited properly and report is overly wordy and difficult to follow</td>
<td>2-3: Report citations are incorrect, and report includes informal language and superfluous information, although logic is mostly consistent</td>
<td>4-5: Report is concise with appropriate use of terminology, logic is consistent and well-stated, no or very few grammatical errors, and citations are formatted correctly</td>
<td></td>
<td>5</td>
</tr>
<tr>
<td>Concise, formal scientific writing</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Consistent, coherent logic follows from the introduction through the discussion</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Minimum of grammatical errors</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Citations are formatted correctly</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Analyses are inappropriate to the hypothesis or dataset, report is missing any summary (tables or figures), and/or source material is not cited (copied material – not in your own words – is an automatic 0)</td>
<td>0-4: Analyses contain significant flaws, tables or figures are difficult to follow and do not clarify the results, and/or the report is missing most or all citations</td>
<td>8-10: All source material is cited, the analyses are appropriate to the hypothesis and dataset, and tables and/or figures clarify the key points in the results</td>
<td></td>
<td>10</td>
</tr>
<tr>
<td>Analyses are appropriate, correctly executed and explained</td>
<td>0-1: Noticeable lack of grammatical editing, source material is not cited properly and report is overly wordy and difficult to follow</td>
<td>2-3: Report citations are incorrect, and report includes informal language and superfluous information, although logic is mostly consistent</td>
<td>4-5: Report is concise with appropriate use of terminology, logic is consistent and well-stated, no or very few grammatical errors, and citations are formatted correctly</td>
<td></td>
</tr>
<tr>
<td>Tables and/or figures clarify rather than detract from the writing</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Citations are included for all source material</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Student submitted peer review form of group members</td>
<td></td>
<td></td>
<td></td>
<td>5</td>
</tr>
<tr>
<td>Student received satisfactory review by group members</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0-1: Did not complete review, and unsatisfactory review by peers</td>
<td>2-3: One or more serious concerns raised by peers, and/or did not complete review</td>
<td>4-5: Trivial or no concerns raised by peers, and completed peer review</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Peer Review (Individual)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Technical Content (Group)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Analyses are appropriate, correctly executed and explained</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tables and/or figures clarify rather than detract from the writing</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Citations are included for all source material</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0-1: Did not complete review, and unsatisfactory review by peers</td>
<td>2-3: One or more serious concerns raised by peers, and/or did not complete review</td>
<td>4-5: Trivial or no concerns raised by peers, and completed peer review</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total Potential Assignment Points</strong></td>
<td></td>
<td></td>
<td></td>
<td>30</td>
</tr>
</tbody>
</table>

RUBRIC: Unit Quizzes

<table>
<thead>
<tr>
<th>Course Unit</th>
<th>Fair</th>
<th>Good</th>
<th>Excellent</th>
<th>Potential Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unit 1</td>
<td>0-1: Quiz not completed, or &lt;2 answers correct</td>
<td>2-3: Quiz completed, &lt;4 answers correct</td>
<td>4-5: Quiz completed, 4 or more answers correct</td>
<td>5</td>
</tr>
<tr>
<td>Unit 2</td>
<td>0-1: Quiz not completed, or &lt;2 answers correct</td>
<td>2-3: Quiz completed, &lt;4 answers correct</td>
<td>4-5: Quiz completed, 4 or more answers correct</td>
<td>5</td>
</tr>
<tr>
<td>Unit 3</td>
<td>0-1: Quiz not completed, or &lt;2 answers correct</td>
<td>2-3: Quiz completed, &lt;4 answers correct</td>
<td>4-5: Quiz completed, 4 or more answers correct</td>
<td>5</td>
</tr>
<tr>
<td>Unit 4</td>
<td>0-1: Quiz not completed, or &lt;2 answers correct</td>
<td>2-3: Quiz completed, &lt;4 answers correct</td>
<td>4-5: Quiz completed, 4 or more answers correct</td>
<td>5</td>
</tr>
<tr>
<td><strong>Total Possible Quiz Points</strong></td>
<td></td>
<td></td>
<td></td>
<td>20</td>
</tr>
</tbody>
</table>
### RUBRIC: Unit Participation

<table>
<thead>
<tr>
<th>Course Unit</th>
<th>Readings &amp; Quizzes</th>
<th>Online &amp; In-Class Participation</th>
<th>Potential Points</th>
</tr>
</thead>
</table>
| **Unit 1**  | 0: Readings or quiz not completed  
               1: Completed readings and quiz | 0: No engagement in online or in-class discussion  
                                          1-2: Only minimal engagement in discussion  
                                          3-4: Engaged in course material, online or in-class | 5 |
| **Unit 2**  | 0: Readings or quiz not completed  
               1: Completed readings and quiz | 0: No engagement in online or in-class discussion  
                                          1-2: Only minimal engagement in discussion  
                                          3-4: Engaged in course material, online or in-class | 5 |
| **Unit 3**  | 0: Readings or quiz not completed  
               1: Completed readings and quiz | 0: No engagement in online or in-class discussion  
                                          1-2: Only minimal engagement in discussion  
                                          3-4: Engaged in course material, online or in-class | 5 |
| **Unit 4**  | 0: Readings or quiz not completed  
               1: Completed readings and quiz | 0: No engagement in online or in-class discussion  
                                          1-2: Only minimal engagement in discussion  
                                          3-4: Engaged in course material, online or in-class | 5 |

**Total Potential Participation Points** | **20**