

E555 Urban Ecology – Syllabus, spring 2016, 3cr, 1-4-16 Final

Meeting Schedule and Location:

Tuesdays – 4-6:30pm

Tocqueville Room, The Vincent & Elinor Ostrom Workshop in Political Theory & Policy Analysis
513 N. Park Avenue, IUB

Exams: None

Instructor:

Burnell “Burney” C. Fischer, Ph.D., CF, Clinical Professor Emeritus, IUB SPEA
Senior Research Fellow & Affiliated Faculty (formerly Co-Director/Interim Director) Ostrom Workshop
Building #3, Ostrom Workshop, 513 N. Park Ave (note: I do not have an office at SPEA)
Office - 812-855-0441, Cell 765-414-4198
bufische@indiana.edu

Burney is in his 11th year at IUB. He was previously State Forester/Director, IDNR Division of Forestry (1990-2005), Professor/Extension Forester at Purdue University (1977-97) and Assistant Professor at UMass (1974-77). For the past 10 years he has taught E422/E522 Urban Forest Management (UFM). The course has increased in size each year as well as placed course graduates in both internships and full-time positions in urban forestry/ecology related employment. In 2014 UFM was split into separate undergraduate and graduate sections for a one-time experience. **E555 Urban Ecology was initiated in fall 2010 per the request of master’s students taking UFM in spring 2010 and offered again in spring 2012, 2014 & 2015. Urban Ecology is being offered again in spring 2016.**

Dr. Fischer has been active in urban forestry at local, state and national levels for the past 25+ years. He is Past President of the Indiana Urban Forest Council, serves on the Arbor Day Foundation Tree Campus USA Advisory Committee and has been a board member of the national Alliance for Community Trees (ACTrees) and Keep Indianapolis Beautiful (KIB). He served on the Lafayette IN Tree Commission as chair (2001-04), was a member of the Bloomington Tree Commission (2006-10) and was a member of the IUB Campus Tree Committee (2008-14). Professor Fischer is active in urban forestry research and service at IUB and the City of Bloomington by providing leadership in a variety of initiatives including tree inventories, IUB Tree Campus USA designation and securing urban forestry research/service/teaching grants. He is lead for the Bloomington Urban Forestry Research Group (BUFRG) at the Center for the study of Population, Institutions and Environmental Change (CIPEC). He received the 2013 Frederick Law Olmsted Award from the Arbor Day Foundation, which recognizes an outstanding individual who has had a positive impact on the environment due to their lifelong commitment to tree planting and conservation at a state or regional level. The following story highlights his award http://www.indiana.edu/~spea/news/burney_arbor.shtml. In 2014 he was recognized by the Indiana Urban Forest Council with their Outstanding Lifetime Achievement Award in promoting the principles of urban forestry in Indiana.

Secretary:

Jennifer Mitchner jmitchne@indiana.edu

Office Hours:

Available most TTH’s 11am-1pm SPEA Atrium; Workshop office before Tues class; individual meetings scheduled via email

Prospectus:

The emerging discipline of urban ecology, a subfield of ecology, deals with the interaction of organisms in an urban or urbanizing community and their interaction with that community. With over 50% of the world’s population now living in urban or urbanizing areas, and urbanization of the landscape in the US expected to grow from 3.1% (2000) to 8.1% by 2050 (Nowak 2005), urban ecosystems are becoming a dominate landscape feature. These urban areas are influential well beyond their perceived borders and shape how many people view the built world. Research in urban ecology, urban ecosystems and in urban social-ecological systems (or SES’s) is rapidly expanding with an ever broadening array of journals, books and other publications as well as new research centers and collaborative projects. Our task in this course is to begin to sort out this complex situation and help each of us develop personal syntheses for ourselves in regard to the ecology of our cities and how to sustainably manage them.

General Course Format and Content:

This is an elective course and it is assumed that enrolled graduate students are interested in learning about and discussing the topic of urban ecology. Although the course will generally cover the topic of urban ecology, it will be flexible enough to allow for individual student outreach into topics of specific interest with regard to urban and urbanizing areas. Overarching these topics will be a set of themes that we will revisit weekly (see handout). Also, we will monitor active current events to enhance the learning experience with real world situations via weekly reviews of articles posted on the Nature of Cities <http://www.thenatureofcities.com/> and from the Atlantic CityLab <http://www.citylab.com/> (formerly Atlantic Cities/Place Matters <http://www.theatlanticcities.com/posts/urban-wonk/>). Students can always post questions to the instructor via email or to the Canvas chat room for classroom discussion.

The course will investigate urban ecology using the Draft Syllabus (working model) proposed below. This is a discussion based course which is co-designed by the students and instructor to cover a wide range of topics and themes in the field of urban ecology. Classroom participation will be critical for each student. There will hopefully be several class meetings with in-person or live video conferences with selected researchers, etc. Each class meeting will be broken up into multiple student team led discussion sessions. During the first half of the semester students will individually prepare a bi-weekly (2 page) memo to the instructor reflecting on what they are currently reading (weekly reading assignments, etc.), how they are progressing on the book report and research paper and general thoughts about urban ecology. Each student will prepare a professional book review and brief presentation (mid-semester due date; can relate to your research paper) on a book of their choice. And, each student will prepare a research paper (original research, research literature review, research based blog suitable for submission &/or research proposal, that might be submitted for funding) on a topic of their choice and give a short presentation on their findings at the end of the semester. A possible goal of the research papers is a conference presentation at the Indiana Academy of Science (Ecology or Environmental Quality Sections), other conferences or similar venues, or a possible submission to a newsletter, magazine or journal.

Draft Syllabus (a working model):

To be reviewed and clarified during the first two class meetings. A starting point for the first eight weeks is the textbook chapter headings (adapted) below. There are other options for us to consider, be prepared to suggest, particularly the insertion of speakers during weeks 3-8 rather than all between weeks 10-14 after spring break.

- 1) Introduction to Urban, Urban Ecology and Urban Ecosystems (read Chapter 1 of textbook)
 - a. What is urban? How does this relate to the concept of the Anthropocene? See posted article from Economist (2012) if this is a new concept to you.
 - b. Read the following article from Atlantic Cities “The Rise of Urban Ecology” (see Canvas Assignments Week #1 for this for article; but it’s the many citations to other articles this is really the interesting stuff) <http://www.citylab.com/weather/2012/11/rise-urban-ecology/4032/>
 - c. See Canvas Assignments Week 1 and Themes/Terminology/etc. folders for readings, handouts, etc.
- 2) Urban Form, Structure and Dynamics (Chapter 2 and so on)
- 3) The Urban Ecosystem: An Overview
- 4) Ecosystems with Urban Areas: Green Space
- 5) Ecosystems within Urban Regions: The Built Environment
- 6) Urban Species
- 7) Nature Conservation in Urban Regions
- 8) Incorporating Ecology in Urban Planning and Design
- 9) Book Reviews – Presentations by Students; Summary of First Half of Course
- 10-14) TBD – Some ideas Listed Below
 - Special theme developed by a Discussion Team (see explanation of Teams below)
 - Invited Guest Speakers – in-person or via Skype/Video Conference – could be urban ecologists, urban planners, research teams, etc. Note: Tocqueville Room technologies are virtually limitless.
 - Class reading/discussion of a short monograph/book, etc.
- 15) Student Paper Presentations; Closing discussion - Future of Urban Ecosystems (Chapter 9)

Readings, Materials & Canvas:

The class textbook is *Urban Ecosystems: Understanding the Human Environment*, by R.A. Francis and M.A. Chadwick. 2013. Routledge, 220 p. This book will give us a basis, particularly for the first 8-weeks to build upon.

The instructor/students will post articles, briefing papers and memos on Canvas (see Canvas info below - This is only Burney’s second experience with Canvas, so we may experiment with other options). It is expected that reading assignments will be read and students will be knowledgeable of the material. Questions about the readings should be brought up to class or posted ahead of time. The instructor can always be contacted via email. Regarding Canvas – We will utilize the following functions of Canvas to start:

- Announcements – general course updates, etc. from the instructor will be posted.
- Assignments – Folders for each week’s readings (Week 1-15), separate folders for Book Reports, Research Papers and misc. folders as needed. This is the go-to place for the class.
- Chat Room – any questions you have for the instructor/classmates outside of class can be posted here. I will review this section daily and respond to questions in the Chat Room. It is particularly important that questions on course policies and content be posted by Monday evening so that they can be addressed during the class on Tuesday afternoon. *Note: the Chat Room is an open site for all course registrants.*
- Grades – all classroom attendance/participation and grades will be promptly posted for your review.
- Syllabus – a listing of all course assignments

Readings and Homework Assignments:

Readings Assignments will be updated weekly during the semester with a new Assignments Week # Readings folder. In addition I will update the revised Assignments - Course Schedule – weekly folder each week.

All written assignments should be typed in the following format: Times New Roman 11-12 font, last name, first name and topic on the top line of the first page, double-spaced, one-inch margins all around, and multi-page assignments must be stapled. Use appropriate footnotes, charts, tables, graphics, illustrations and citations as needed.

Assignments will be given a page limit. The instructor will not read beyond the assigned limit. Assignments should be concise, organized and when necessary appropriately supported with relevant literature. Always cite everything you quote directly or paraphrase. Use in-text citations whenever you quote or paraphrase.

Assignments are to be submitted on the specified due date. Late assignments will be accepted with a penalty of -33.3%/day, unless we have agreed in advance to an alternative. Genuine emergencies where proper documentation is provided may result in the acceptance of a late assignment and different grade adjustment. If you anticipate a serious conflict that prevents you from completing an assignment, please email the instructor beforehand.

Student Progress Memos (3/student) and End of Course Reflection:

Students will be assigned three (2 page maximum) progress memos during the first half of the semester. The purpose of the student progress memos is to describe how you are reading/understanding book chapters and articles, what questions you are asking yourself, and to discuss progress on book reviews, research papers, etc. Six-seven students will write a memo each week. The instructor will attempt to summarize the memos for each batch and share with everyone weekly. **The first batch of progress memos will be due at the third class period and continue through week 8.** We will schedule progress memos at the first/second class period. Progress memos are to be posted at Canvas-Assignments-Progress Memos Week 3-8 by 8pm on Sunday, so that the instructor/fellow students can read them before Tuesday's class. Each student will prepare an end-of-the-course reflection to be submitted after the last class period. More on that near the end of the semester.

Teams leading discussions (3-4 students/team) and Team Briefing Papers:

Teams of 3-4 students will lead discussion/guest speaker sessions for a total of 11 class periods (weeks 3-8, & 10-14). Each student will be the member of three different teams. The team should identify 3-4 articles and develop a briefing paper for the book chapter and each article. Articles are to focus on the primary, peer reviewed literature, although one review and/or application (urban ecology "for" the city) might fit a particular topic. The articles and briefing papers should be sent to the instructor (bufische@indiana.edu) by no later than 5pm Friday of the week before they are to be discussed so that I can post and students can read before the next Tuesday. The briefing paper format is as follows: 2-3 pages in length, complete citation for the assigned reading and student name(s) on the top line, concise paragraph describing the primary purpose/objectives/research questions of the assigned reading, a clear review of how the author(s) meet the purpose/objectives, a paragraph or two describing what you learned from the article, and finally, 1-2 well written trigger question(s) to help elicit class engagement that the team will present during the review/discussion of the article. Teams will lead the discussion of the textbook chapter and articles any way they choose. The key is to engage the class in discussion; this is not expected to be a lecture and note-taking format. If special themes develop, such as the "What is Urban" discussion in week one, there may be need for an additional brief paper to be developed and distributed afterwards.

Book review (1/student):

Each student will prepare one book review for the course. The book should generally be about urban ecology/urban ecosystems, but I give each student the opportunity to find a book that interests them. The review must be between 750-1000 words in length and will be shared with your classmates via Canvas – Assignments – Book Reviews, and a brief class presentation on March 8 (more on this later in the semester). I strongly suggest that you review some standard guidelines and ideas for book reviews by searching "book review guidelines." I have a selection of books to choose from but feel free to select any book that interests you and expands upon your particular area(s) of interests in urban ecology. Submission and justification, one page maximum, of the proposed book you wish to review should be to the instructor by Friday COB, February 12. The book review is due Friday COB, March 4.

Research Paper and Presentation (1/student):

Each student will select a topic in consultation with the instructor to write a research paper (real data) or research literature review or blog suitable for submission for publication or research proposal or combination thereof. A title and pre-proposal (maximum 2 pages) is due to the instructor by Friday COB, February 26 (negotiable date if you need more time is possible). The research paper can be biologically or policy based depending upon the student's interest and must broadly be within the framework of urban ecology/urban ecosystems. I have access to datasets/sources to suggest but students are free to locate others. The text of the paper is limited to 12-25 pages

and should include all necessary citations, etc. Additional pages for appendices – tables, figures, etc are allowed. Each student will schedule a ½ hour meeting with the instructor during late March/early April to review progress of the paper. An outline of your paper would be most appropriate for this meeting. Each student will give a brief 5-10 minute PowerPoint presentation on the results of the research paper on either April 19th or 26th. Final submission due date is Friday COB, April 29. Early submissions are encouraged!

Class Professionalism Policy¹:

Students are expected to act in a professional manner. Excessive violations of professionalism will result in a significant reduction in the participation portion of the grade for the course, which will lower your grade. Violations of professionalism include, but are not limited to the following:

- Activated cell phones or ipods – they should be stored away during class
- Reading the newspaper or sleeping during class
- Arriving late for class or leaving class early (unless agreed upon by instructor beforehand)
- Accessing email or surfing the web during class; quietly taking notes with a computer is acceptable
- Working on material for another course during class
- Exhibiting disrespect for the instructor or classmates
- Disruptive behavior – e.g. carrying on conversations or being excessively noisy
- Engaging in any activity that prevents you from fully participating in the class
- The class period is 2.5 hrs long. There will be breaks, coffee and some snacks. Be prepared to stay for the whole session. Please leave the classroom if you must engage in anything other than class activities and return when you can fully participate.

¹Adapted from Murphy, S. 2006. Surfing in Class, A New Temptation. The ISS Newsletter (July 2006), p 4-5.

Attendance & Classroom Participation:

Informed attendance is required for participation in class discussion. This is a discussion based class, and it only works if all participants are both up-to-date on the readings and willing to actively participate. I record attendance and evaluate classroom participation. A special note about classroom participation - I have found that SPEA students tend to be great note takers but not so great classroom participants. There are of course exceptions to both of these generalizations. I will gently encourage students to be classroom discussion leaders - be prepared for this experience. The quality of participation will impact your participation grade.

Grading:

A necessary evil is that I will grade participation, presentations and submitted papers, and at the end of the course each student will receive a final grade. There will be no quizzes or exams in this course. Remember, my purpose as an instructor is to facilitate learning and the whole experience. All writing assignments count. There are no make-ups, extra credit is not available. My expectation for the distribution of points during the semester is as follows:

Individual Participation (attendance & class discussion)	200 points
Team Led Discussions/Briefing Papers (3/4 class periods)	170
Individual Memos (3) and Reflection	80
Book review + presentation	100
Research paper + presentation	150
Total	700 points

The semester grading scale is 92-100% = A, 82-92% = B, 72-82% = C, 62-72% = D & <62 = F. The instructor reserves the right to adjust this scale downward as well as to assign +'s and -'s.

Other Policies & Information:

Indiana University Code of Student Rights, Responsibilities, and Conduct:

Available online: <http://www.iu.edu/~code/code/index.shtml>

Portions are cut and pasted below.

Indiana University/SPEA Academic Policies:

Available online: http://www.indiana.edu/~spea/about_spea/SPEA%20Policies%20.shtml

Portions are cut and pasted below.

Academic Dishonesty

SPEA faculty do not tolerate cheating, plagiarism, or any other form of academic dishonesty. If you have not done so, you should read the IUB *Code of Student Rights, Responsibilities, and Conduct*, which can be accessed at <http://www.iu.edu/~code/code/index.shtml> so you will be sure to understand what these terms mean and what penalties can be issued for academic dishonesty. Academic dishonesty can result in a grade of F for the class (an F

for academic dishonesty cannot be removed from the transcript). Significant violations of the Code can result in expulsion from the University.

Academic misconduct

Academic misconduct is defined as any activity that tends to undermine the academic integrity of the institution. The university may discipline a student for academic misconduct. Academic misconduct may involve human, hard-copy, or electronic resources.

Policies of academic misconduct apply to all course-, department-, school-, and university-related activities, including field trips, conferences, performances, and sports activities off-campus, exams outside of a specific course structure (such as take-home exams, entrance exams, or auditions, theses and master's exams, and doctoral qualifying exams and dissertations), and research work outside of a specific course structure (such as lab experiments, data collection, service learning, and collaborative research projects). The faculty member may take into account the seriousness of the violation in assessing a penalty for acts of academic misconduct. The faculty member must report all cases of academic misconduct to the dean of students, or appropriate official.

Plagiarism

Plagiarism is defined as presenting someone else's work, including the work of other students, as one's own. Any ideas or materials taken from another source for either written or oral use must be fully acknowledged, unless the information is common knowledge. What is considered "common knowledge" may differ from course to course.

- A student must not adopt or reproduce ideas, opinions, theories, formulas, graphics, or pictures of another person without acknowledgment.
- A student must give credit to the originality of others and acknowledge indebtedness whenever:
 - 1) directly quoting another person's actual words, whether oral or written;
 - 2) using another person's ideas, opinions, or theories;
 - 3) paraphrasing the words, ideas, opinions, or theories of others, whether oral or written;
 - 4) borrowing facts, statistics, or illustrative material; or
 - 5) offering materials assembled or collected by others in the form of projects or collections without acknowledgment.

Civility

Civilities is important in an academic community to ensure that all parties—students, staff, and faculty—are working in an environment that fosters achievement of the individual's and community's goals and objectives. Civility requires all parties to demonstrate personal integrity and conduct themselves in a manner that shows respect, courtesy and tolerance to others. Examples of discourteous behaviors during class include reading the newspaper, listening to headphones, talking or laughing with others, chronically arriving late, and so forth. These behaviors are distracting to the instructor and classmates, and SPEA faculty will address these problems as they arise. Maintaining and fostering civility inside and outside the classroom is especially important to SPEA, which is a professional school.

Pursuant to the Indiana University Student Code of Conduct, disorderly conduct which interferes with teaching, research, administration, or other university or university-authorized activity will not be tolerated and will be immediately reported to the Office of The Dean of Students for appropriate disposition which may result in disciplinary action including possible suspension and/or expulsion from the university.

Course Withdrawals

Students who stop attending class without properly withdrawing from the class may receive a grade of F. It is important to withdraw from a course within specified timeframes. Note that withdrawals after Week 12 of a regular session are rarely granted. *Poor performance in a course is not grounds for a late withdrawal.*

No withdrawal forms will be processed in the Office of the Registrar after the last day of classes. Any requests for a late withdrawal after the last day of classes must go through the grade appeal process, but each student should remember that in accordance with campus policy, SPEA does not permit a student to withdraw from a course if he/she has completed the course requirements. Grade replacement should be used in this case. To withdraw, obtain a withdrawal slip (DROP/ADD Form) from the SPEA Student Services window. Instructions for completing it are given on the form.

E555 Urban Ecology – Topics/Readings, Sp 2016, B.C. Fischer – 3-9-16 draft

All papers are located in Canvas Assignments Weekly Folders

**Week #1 January 12 – Welcome to the Workshop and Urban Ecology; Course introduction and all that stuff
Topics – What is Urban; Urban Ecology Themes hdout – lengthy discussion; The Anthropocene
Read Chapter 1 of Textbook – An introduction to urban ecology and urban ecosystems**

Read Fischer prepared introductory handout and PPT on urban ecosystems

Read the following article from Atlantic Cities "The Rise of Urban Ecology (see Resources Week 1 for article and the many citations to other articles this is really the good stuff. <http://www.citylab.com/weather/2012/11/rise-urban-ecology/4032/>

[Check out the Nature of Cities blog at http://www.thenatureofcities.com/](http://www.thenatureofcities.com/)

The Economist. 2011 (May 26). Welcome to the Anthropocene: Humans have changed the way the world works. Now they have to change the way they think about it, too. 11p

Pickett et. al. 2008. Beyond Urban Legends: An Emerging Framework of Urban Ecology, as Illustrated by the Baltimore Ecosystem Study. *Bioscience* 58(2): 139-150.

**Week #2 January 19 – Clean up lingering course format questions, discuss book reviews and research papers
Topics - Finalizing class definitions of urban, urban ecology, etc.; First class discussion of assigned articles; See model briefing paper; Assignments of teams (3 students/team) for Weeks 3-14; Introduction of Book Review and Research Paper Assignments**

Read Chapter 2 of Textbook – Urban form, structure and dynamics

Pickett, S.T.A., J.M. Grove. 2009. Urban Ecosystems: What would Tansley Do? *Urban Ecosystems* 12: 1-8.

Alberti et al. 2003. Integrating Humans into Ecology: Opportunities and Challenges for Studying Urban Ecosystems. *Bioscience* 53(12): 1169-1179.

Grove, J.M. 2009. Cities: Managing Densely Settled Social-Ecological Systems, p281-294. In Chapin, F.S, et.al. *Principles of Ecosystem Stewardship: Resilience-Based Natural Resource Management in a Changing World*. Springer. 402p. ISBN 978-0-387-73032-5 – **see model briefing paper by S.K. Mincey**

Mchale, M.R., et.al. 2013. Urban Ecology in a developing world: why advanced socioecological theory needs Africa. *Frontiers in Ecology and the Environment* 11(10): 556-564.

Tanner, C.J., et.al. 2014. Urban ecology: advancing science and society. *Front Ecol & Environ* 12(10): 574-581

Week #3 January 26

Chapter 3 – The urban ecosystem: an overview

Lyytimäki, J. 2013. Nature's Nocturnal Services: Light Pollution as a Non-recognised Challenge for Ecosystem Services Research and Management." *Ecosystem Services* 3, e44-e48.

Hope, D., et. al. 2003. Socioeconomics Drive Urban Plant Diversity. *PNAS* 100 (15): 8789-92.

Wurster, D. M. Artmann. 2014. Development of a Concept for Non-monetary Assessment of Urban Ecosystem Services at the Site Level. *Ambio* 43(4): 454-65.

Week #4 February 2

Chapter 4 Ecosystems with urban regions: green space

Colding J., et.al. 2006. Incorporating green-area user groups in urban ecosystem management. *Ambio* 35(5):237-2244.

Ishimatsu, K., I. Keitaro. 2011. Brown/biodiverse roofs: a conservation action for threatened brownfields to support urban biodiversity. *Landscape Ecol Eng* 9:299-304.

Bixby, H., et. al. 2015. Associations between green space and health in English cities: An ecological, cross sectional study. *PLoS ONE*, 10(3).

Week #5 February 9

Chapter 5 Ecosystems within urban regions: the built environment

DeCandido, R., D. Allen. "Nocturnal hunting by Peregrine Falcon at the Empire State Building, New York City." *The Wilson Journal of Ornithology* (2006): 118(1):53-58.

Shredweka, S., A. Mugdy. 2011. The Living walls as an Approach for a Healthy Urban Environment. *Energy Procedia* 6: 592-599.

Afshinnekoo et al. 2015. Geospatial resolution of human and bacterial diversity with city-scale metagenomics. *Cell systems* 1: 72-87.

Week #6 February 16

Chapter 6 Urban species

Lowry H., L. Alan, B. Wong. Tolerance of auditory disturbance by an avian urban adapter, the Noisy miner. 2011. *Ethology* 117: 490-497.

Pennington, D.N., J.R. Hansel, D.L. Gorchov. Urbanization and riparian forest woody communities: Diversity, composition, and structure within a metropolitan landscape. 2010. *Biological Conservation* 143: 182-194.

Pattishall, A., D. Cundall. Habitat use by synurbic watersnakes (*Nerodia sipedon*). 2009. *Herpetologica* 65(2): 183-198.

Week #7 February 23

Chapter 7 Nature conservation in urban regions

Standish, R.J., Hobbs, R.J., & Miller, J.R. (2013). Improving city life: Options for ecological restoration in urban landscapes and how these might influence interactions between people and nature. *Landscape Ecology*, 28, 1213-1221.

Robbins, P., S. A. Moore. 2012. Ecological anxiety disorder: diagnosing the politics of the Anthropocene. *Cultural Geographies* 20(1): 3-19.

Baldwin, Andrew H. 2004. Restoring complex vegetation in urban settings: The case of tidal freshwater marshes. *Urban Ecosystems* 7:125-137.

Week #8 March 2

Chapter 8 Incorporating ecology in urban planning and design

Pickett, Steward TA, et al. "Urban ecological systems: linking terrestrial ecological, physical, and socioeconomic components of metropolitan areas." *Urban Ecology*. Springer US, 2008. 99-122.

Kazemi, Fatemeh, Simon Beecham, Joan Gibbs. "Streetscale bioretention basins in Melbourne and their effect on local biodiversity." *Ecological Engineering* 35.10 (2009): 1454-1465.

Sing, Kong-Wah, et al. "Urban parks: refuges for tropical butterflies in Southeast Asia?." *Urban Ecosystems* (2016): 1-17.

Week #9 March 19

Book review presentations

March 15-19 Spring Break

March 22 Session on "Where's the Ecology in Urban Ecology" – Vicky Meretsky & Heather Reynolds as guests. Articles posted about March 19th - Amy, Emma & Yingchu

March 29 Butler CUE – articles already posted in Butler CUE Assignments folder with trigger questions memo - Burney, Jeff, Tenzin

April Paige Warren, UMass (Skype) – Nathan, Maya & John

April 12 B'ton applied folks mix – Melissa Clark (SPEA), Amy Thompson (B'ton urban planning), P&R?, etc., green infrastructure theme - Kaitlin, Amanda, Ryan, Julie

April 19 Kristin Shaw, USF&WS, in person & Chicago Field Museum rep (Skype?), Monarch's (pollinators) – Abby, Amanda, Aileen

April 26 Research Paper Presentations, discuss final Reflections to Burney after Semester.