

**DATA, DISTRIBUTIONS AND HYPOTHESES:
EXPLORING DIVERSITY AND DISTURBANCE IN THE TALLGRASS PRAIRIE**

BIOL 585, Fall 2011

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Week 4: Broader Significance and Real-World Applications

LAB OVERVIEW

Over the past 3 weeks of this lab module, you have explored the effects of fire disturbance on tallgrass prairie plant communities by evaluating published data from the Konza Prairie Biological Research Station and by collecting, analyzing and interpreting your own data from the Prophetstown State Park tallgrass prairie restoration site. While a firm foundation in the ecology of tallgrass prairie is essential for successful conservation and restoration of this ecosystem, the biologists involved in prairie restoration and management must apply these ecological principles within a complex social, economic and political landscape. Today's lab activity aims to integrate the knowledge you have acquired over the past three weeks with "real world" challenges and constraints that may accompany restoration decisions. Working in groups, you will (1) address a series of questions about your team's approach to your particular scenario to develop a mini "restoration and management plan" associated with your particular scenario, and (2) prepare an informal presentation summarizing your team's discussion to present to the class near the end of the lab period.

Objectives of this lab:

1. Develop an understanding of the ecological complexities associated with habitat conservation, restoration and management, and how these can vary depending on the specific restoration goals and constraints.
2. Identify, read and interpret journal articles from the primary literature in the context of a specific scenario regarding the conservation, management and/or restoration of tallgrass prairie
3. Engage in critical but constructive conversations with your peers about the priorities and challenges associated with different scenarios, and practice presenting your decisions within groups and to the class.

TALLGRASS PRAIRIE RESTORATION SCENARIOS

**These are the same scenarios that were presented to you in the Week 3 Writing Assignment*

Scenario 1: You are employed by the Partners for Fish & Wildlife program within the United States Fish and Wildlife Service field office in Indiana (see the mission statement at <http://www.fws.gov/partners/>). You have been charged to work with local private landowners to develop tallgrass prairie restoration sites on grasslands used primarily for cattle grazing. Most landowners are reluctant to incorporate native prairie grasses into their operation because of the additional management requirements and expenses. They also perceive that it is very difficult to successfully establish prairie species. Your main goal is to increase habitat for several threatened grassland bird species in Indiana, including the Grasshopper sparrow and the Eastern meadowlark. (For a news story about someone who

does this kind of work, see http://news.mongabay.com/2008/1028-traina_filsinger.html)

Additional relevant information can be found at the following websites:

<http://www.in.nrcs.usda.gov/technical/Grazing%20and%20Forages/grazingandforages.html>

http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/technical/nra/ceap/?&cid=nrcs143_014159

<http://www.moprairie.org/>

<http://www.npwrc.usgs.gov/resource/literatr/grasbird/index.htm>

Scenario 2: You are part of a tallgrass prairie restoration team that works for the Nature Conservancy in Northern Indiana. Your local office has just purchased 15,000 acres of farmland in rural Indiana for tallgrass prairie restoration. Much of this land has been drained and tilled for agriculture, and your primary goal is to restore it to tallgrass prairie and maximize the biodiversity of native prairie species at the site. Your local office is staffed with two full-time biologists and you have two summer internship positions. (See TNC's mission and vision statement at <http://www.nature.org/aboutus/visionmission/index.htm>).

Scenario 3: You are a restoration ecologist employed by a local ecological consulting firm. Your firm has recently acquired a contract from a large construction company to create and manage a mitigation site for a wetland that will be lost when a new elementary school is built in a rapidly-growing suburb of Indianapolis. This mitigation will require a 15 acre tallgrass prairie buffer to be created around a newly constructed wetland. After planting, the prairie portions of the site will be monitored to determine whether 3 key criteria are being met. These criteria are (1) a certain level of percent cover by native vegetation, (2) the exclusion of invasive exotic species, and (3) the establishment of general wildlife habitat value. The site you have identified for the mitigation is outside of city limits, but adjacent to several country homes and is currently a fallow farm field dominated by a combination of cool season grasses and goldenrod. Additionally, there are several small clusters of Tree of Heaven (*Ailanthus altissima*) and one large population of Canada thistle (*Cirsium arvense*) growing on the site. Finally, there is a 4 lane state highway that runs along the West side of the mitigation site. The contractor has deferred to your firm with regard to when and how the prairie installation is to be done and how the site is to be maintained. Your contract is a 5 year agreement and the client is expecting a summary of how you propose to proceed, including major tasks and a rough timeline. (For an example of a prominent ecological consulting firm that engages in prairie and wetland restoration efforts see the Cardno JFNew website: <http://www.cardnojfnew.com/>)

Scenario 4: You are employed by a local land trust that has just received a donation of 20 acres of farmland immediately west of Purdue University. A primary goal of your particular office is to facilitate the exposure of the general public to the biodiversity that once dominated our region. Consequently, you want to create a prairie restoration that is easily accessible to schoolchildren, college classes, hikers, botanists, entomologists, and outdoor enthusiasts. To learn more about landtrusts, see (<http://www.landtrustalliance.org/about>); for an example of a strong local land trust involved in habitat restoration visit <http://www.nicheslandtrust.org/>.

Scenario 5: You are working with a team of extension faculty in the Horticulture and Landscape Architecture Department at Purdue. A local landowner has recently donated 10 acres of former soybean fields to your department that lies adjacent to Klondike Elementary school just west of West Lafayette. The donation came with the stipulation that

one acre be developed as an outreach and education site for the elementary school children to learn about prairie ecosystems and conservation.

GROUP ASSIGNMENTS

Below are the scenario assignments for this lab activity. Identify the other individuals in your lab sections that have addressed the same scenario as you and sit together to complete the group discussion questions (below) and prepare your presentation.

Morning Lab		Afternoon Lab	
Last Name	Scenario	Last Name	Scenario
Brahos	2	Bassett	2
Bruns	4	Bauer	3
Coombs	3	Beight	2
Garvert	2	Burkhard	3
Gibson	3	Caldwell	1
Gunn	3	Cox	5
Hurst	5	Cragun	3
Ikerd	5	Crum	3
Ji	2	Freeland	4
Karlsson	4	Guyenn	1
Lin	4	Hoover	5
Logan	5	Hurt	4
Ma	5	Jaramillo	2
Madden	3	Jin	3
Mosbrucker	3	Kim	5
Page	1	Littell	1
Pignotti	4	Macy	4
Spigler	1	McGuire	4
Waszak	5	Scardina	1
Wright	1	Skillman	4
Young	1	Snyder	2
Yu	2	Venort	5
Zenobio	5	Wildnauer	2
		Zelinka	1

GROUP DISCUSSION ACTIVITY

Once you have identified the students in your group, work together to collectively develop responses to #1-4 below. Designate one person in your group to record your answers on paper, and another to present them to the class (see below). You will have approximately 90 minutes to complete this portion of the lab.

1. As a group, discuss the ideas that you each prepared for #1 in Writing Assignment 3. Try to reach a consensus on a minimum of 5 sociological and/or economic goals and constraints associated with your restoration project. Next, work together to identify how these goals and constraints will influence your restoration and management decisions. For example, if a primary goal of your project is to maximize its educational value, then you may choose to create a prairie system that is highly fragmented by roads and trails to increase its accessibility to visitors. This may have ecological consequences for the wildlife that will ultimately inhabit the area.
2. Each person in the group has an opportunity to briefly summarize the 2 papers that s/he found prior to coming to class, and explain their relevance to the group's scenario. After everybody has presented their papers, the group will identify the 3-5 papers that are most relevant to the answer developed in #1 above. For each of these papers, write down (a) the citation, (b) a 2-3 sentence statement of the paper's major points, and (c) a 2-3 sentence summary of the paper's relevance to your scenario.
3. Discuss your individual answers to #3 of the Week 3 Writing Assignment. List several ecological management techniques that you will implement that will help you meet your goals. These methods can involve the initial design and creation of your restoration site, or the subsequent maintenance and management of it. Identify any costs or trade-offs associated with these decisions. Use your literature sources to guide and justify these decisions. For example, if one of your goals is to maximize species diversity, then suggest management techniques (e.g., specific burning or grazing rotations) that will help you accomplish that goal, and refer to the papers that support these methods. Summarize your discussion in writing.
4. Read the scenarios assigned to the other groups. As a team, develop one question to ask each group during their presentation.

GROUP PRESENTATIONS

After your group has addressed all of the discussion questions above, prepare to present your scenario and a summary of your group discussion to the class. You do not need to prepare slides; this is intended to be an informal discussion rather than a formal presentation. When other groups are presenting, compare the constraints and circumstances of their scenarios to your own, and be prepared to ask the questions you developed in #4 of your group assignment.

LAB GRADE

You will turn in your Week 3 writing assignment and your write-up for your group discussion at the end of your lab section. Additionally, your TA will evaluate your participation in the class discussion. These 3 components will contribute equally to your lab grade for the day.