

Application for a Research Permit for The BNP

permit 2006-013

Name (Last, First, MI):

Fraser, Lauchlan, Mitchell, Randall; Pan, Jean; Smith, Greg.

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Title of Research: **Energy Flow through Grassland Ecosystems and the Importance of Detritivores for Trophic Dynamics. (Continuation of Fraser's permit from Spring 2002)**

Briefly describe the research to be conducted at the BNP in non-technical language (this paragraph will be used in describing your research to the public).

This research is aimed at understanding the ecological interactions in the grasslands of Grandview Alley. We are monitoring plants, microbes, insects, small mammals, and birds. It is a continuation of work from an earlier permit.

Briefly describe the goals of the proposed research.

The main goal is to determine the effects of energy flow through grassland ecosystems, with a specific focus on biodiversity. The flow of energy in ecosystems begins with the conversion of the sun's energy by plants. We can determine plant energy by the relative weight of plants in a defined area. Before the onset of this experiment, the grasslands on Grandview Alley were at a moderate productivity level because the field had not been fertilized for at least three years. This experiment uses two treatments that affect productivity: (1) fertilization and (2) grass clipping removal. These are low impact treatments that will have no adverse effects on the integrity of the fields, require no

fences or boundaries, and will not be noticed by the general public.

For the first treatment, we have experimentally increased productivity by adding fertilizer in selected 20-meter diameter plots. By adding fertilizer we increased the potential for higher energy flow. In other words, we increased the weight of the plants per unit area. The second treatment required removing grass clippings from selected plots each year, which reduces energy flow by removing nutrients locked in the grass clippings - nutrients that would otherwise have been broken down and cycled through the ecosystem by decomposers. By manipulating energy flow we can determine the differential effect on plants, microbes, insects, small mammals and birds. For example, does diversity increase with an increase in energy? Conversely, does diversity decrease with a reduction in energy? Do different taxa respond differently to these treatments? These questions, and others, will help us understand the function of the grassland ecosystems at the Bath Nature Preserve so that we can better help to manage them.

Our hope is that this project will yield significant results providing a better understanding of grassland communities as well as facilitate a respectable relationship between researchers and the Bath community.

What are the GPS coordinates or locations of your proposed research?

Grandview Alley in existing lots (24 plots circular plots (20 m diameter), with tall fence posts in center

What is the expected duration of your proposed research? Summer 2006-Spring 2010

What is the Web address of your research outline?

<http://www.uakron.edu/biology/mitchell/>

Briefly outline of methods to be used. Be sure to include outlines of the equipment to be used (if any) in the research.

See above

Outline the use of markers/cages/fences/etc. for your research. Note: in receiving a research permit, you must agree to remove all such research tools at the completion of your study.

Aside from the stakes marking the center of each plot in Grandview alley, we will only use temporary marking flags in the plots.

What is the potential impact of your research on nature preserve?

The treatments will have no adverse effects on the integrity of the fields, require no fences or boundaries, and will not be noticed by the general public. We will collect some insects, plant materials, soil, and will temporarily trap and inspect rodents at intervals over the year.

Have you looked at the listings and web sites of the research being conducted at BNP?

<http://www3.uakron.edu/biology/bath/active.html> Yes ___XXXXX_ No___

Are there any potential conflicts of your research with others at BNP? Yes ___ No__XX__

Explain:_____

To be granted a research permit for work at the BNP, you must agree to the following terms:

- Researchers are responsible for obtaining the appropriate state or federal permits for the conduct of their research on the BNP (e.g., when working with regulated species).
- Researchers are responsible for removing all markers, etc. from their research plots when the research is completed.
- Researchers must build a web site (immediately after being granted a permit) outlining their research at the BNP so that other researchers can avoid the proposed research site(s). Therefore, the web site must clearly outline, using one or more maps, the exact location(s) of the proposed research.
- Researchers will file an annual (due in yearly increments based on the date of the permit) and final report. Such reports will include: user days on the BNP, a summary of results of the project(s), a list of data generated and contact information for those interested in the data, and a list of publications resulting from the project(s).
- Any publications resulting from research conducted at the BNP must acknowledge the use of the preserve by referencing the BNP permit number. A copy of any such publication should be filed with the BNP committee.
- To abide by the rules and regulations of the BNP in any and all conduct of research at the BNP.

By signing the request for a BNP research permit below, I agree to the above terms and state that all of the above information is correct to the best of my knowledge. I also agree to amend my above permit request if my research plans change such that they are no longer well represented in the information supplied in this permit request. If I fail to notify the BNP oversight committee of significant changes in my research, or if I do not follow the rules of the BNP, I realize that the BNP oversight committee can revoke my research permit, and disallow any further work by me, research or otherwise, at the BNP.

Signature: *Randy Mitchell* Date: August 21 2006

Print Name: Dr. Lauchlan Fraser, Dr. Randall J. Mitchell, Dr. Jean Pan, Dr. Greg Smith

Approval:

Bath Township: _____ Date: _____

University of Akron: _____ Date: _____