

## Application for a Research Permit for The BNP

Name (Last, First, MI):\_Bagatto, Brian P.\_\_\_\_\_, Date:\_\_\_07/28/2005\_\_\_\_\_

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Title of Research:\_\_\_ Ecological effects of hypoxia-reared zebrafish (*Danio rerio*)\_\_\_\_\_

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).

\_\_ Fish in the Great Lakes and many lakes in Ohio frequently experience water that is low in oxygen content. In most cases, this does not kill the fish outright, but it can severely impact the fish's ability to swim, avoid predators, obtain food, and reproduce. We have studied this aspect of low oxygen (hypoxia) in the laboratory but would like to move this experiment to a more complex system in the field. Thus, we would like to create artificial small systems using 100 gallon tanks and expose these fish to natural fluctuations in temperature, sunlight, and aquatic microorganisms. Zebrafish will be used because they have become a model organism and have an extensive research base much like trout. We will rear zebrafish in the lab under regular and low oxygen conditions until they are juveniles. We will then transport them and put them into the tanks at BNP and measure how they survive these conditions and how successful they are are producing young.\_\_\_\_\_

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Briefly describe the goals of the proposed research.

\_\_ This project entails both a laboratory component and a field component. In the laboratory component, zebrafish (approximately 2000 eggs) will be randomly assigned to either a normoxic environment (7 mg/l dissolved oxygen) or a hypoxic environment (1 mg/l dissolved oxygen). After

one month of development, the juveniles will be transferred to plastic cattle tanks located at the Bath Nature Preserve. Four replicates housing normoxic-reared fish only and 4 replicates housing hypoxic-reared fish only will assess relative survival and fecundity of each developmental treatment. Eight replicate tanks housing both normoxic-reared and hypoxic-reared fish will assess the competitive abilities of the two treatments. With the 8 replicate tanks, 4 tanks will have hypoxia-reared fish marked and in the other 4 replicates, the normoxia-reared fish will be marked. These tanks will be buried and covered with shade cloth such that the heat will not raise the temperature to lethal limits. All fish will be collected at the end of October for census, morphological and physiological data collection. A variation on this experiment may be repeated during the summer of 2006.

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On which research areas of the preserve will your research occur? MARTIN FIELD CENTER GROUNDS

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What are the GPS coordinates or locations of your proposed research? \_\_\_\_\_Grassy area east of Mart.  
Field Center

Does your proposal involve areas that are not part of the designated research areas? \_\_\_no\_\_\_

(if yes, this permit will require approval from the Bath Trustees – this can only be sought four times a year, and so approval of your permit may take up to several months). Talk with the BNP Committee for more details.

What is the expected duration of your proposed research? \_\_\_through August 2006\_\_\_\_\_

What is the Web address of your research outline? [http://\\_\\_\\_\\_\\_](http://_____)  
Briefly outline of methods to be used. Be sure to include outlines of the equipment to be used (if any) in the research

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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.

\_\_\_\_\_N/A\_\_\_\_\_

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\_\_\_\_\_

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

\_\_\_\_\_The only impact is the moving of small amounts of soil so that the tanks can be buried\_\_\_\_\_

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  No \_\_\_\_\_

Are there any potential conflicts of your research with others at BNP? Yes \_\_\_\_\_ No

Explain:\_\_\_\_\_

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**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.

*Approved by Bath Trustees subject to measures to prevent fish from escaping to colonize the preserve*

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Print Name: \_\_\_\_\_

Approval:

University of Akron: \_\_\_\_\_ Date: \_\_\_\_\_