

Application for a Research Permit for The BNP

Permit 2005-003

Name (Last, First, MI): **Blackledge, Todd A.**

Date: **17 – March - 2005**

Affiliation: **Assistant Professor, The University of Akron**

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Title of Research: **Does web architecture affect prey capture by spiders?**

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).

Orb-weaving spiders are dominant predators of insects in forest and field ecosystems. However, little is known about how the shapes of webs affect what types of insects are captured by spiders. This project will seek to answer that question by manipulating various aspects of the shapes of the webs, such as size and spacing of silk threads, and then observing the effects of those changes on the numbers and types of insects that spiders capture.

Briefly describe the goals of the proposed research.

This project is designed to test the hypothesis that the shape of orb webs influences what insects are captured by spiders. I will specifically test whether decreasing the size of webs reduces prey capture. I will also test whether increasing the distance between rows of the sticky spiral of the orb web increases the average size of insects captured (because small

insects can fly between the larger gaps) or decreases the average size of insects captured (because fewer strands of sticky silk adhere to large insects).

On which research areas of the preserve will your research occur?

Various – I expect that the study will be confined to the designated research areas. Both *Micrathena* and *Leucauge* are expected to be abundant in oak forest. *Argiope* will likely be abundant in the wetland and grandview ally areas.

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

See above

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?

Summer 2005 - Summer 2006

What is the Web address of your research outline?

<http://www3.uakron.edu/biology/blackledge/tab.htm>

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

The study will utilize three common orb spiders, the black and yellow garden spider

(*Argiope aurantia*), the spiny spider (*Micrathena gracilis*) and the orchard spider (*Leucauge venusta*). It will involve the manipulation of webs in the field by selectively removing silk

fibers from webs and the marking of the locations of those webs with flagging tape so that they can be observed over 24 hour periods. All insects captured by the spiders will be collected for identification and measurement in the laboratory.

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.

Flagging tape will be used as a temporary (1-2 day) marker for individual webs. Some spiders will also be allowed to construct webs within “window pane”-like cages that will be moved to the study areas during daylight hours only.

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

There is little impact expected. The three species of spiders are among the most abundant spiders in the preserve and all have an immense reproductive capacity of hundreds of eggs per female so that the removal of a few spiders for this study will not affect their population on the BNP. The insects that spiders will capture during the study (and removed to the laboratory) are the same insects that would be captured and eaten by these spiders if no experiment were being conducted.

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

Are there any potential conflicts of your research with others at BNP? **No**

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: _____ Todd Blackledge _____

Date: 17-March-2005

Print Name: Todd A. Blackledge

Approval:

Bath Township: _____

Date: _____

University of Akron: _____

Date: _____