NORTHEAST REGIONAL CONSERVATION NEED GRANT QUARTERLY REPORT

Grant Number: **2010-01**
Grant Title: **"*Laboratory and Field Testing of Treatments for White Nose Syndrome: Immediate Funding Need for the Northeast Region*"**
Grant Receipt**: Bucknell University**
Grant Contact Name: **DeeAnn M. Reeder, Department of Biology**
Report # - **3rd quarter (July 1, 2013 to September 30, 2013)**

Were planned goals/objectives achieved last quarter? **For the quarter, yes.**

Regional Conservation Need Addressed:

Priority RCN Topic number 12 " Identify and Address Factors Contributing to the Regional Decline of Populations of SGCN". Hibernating bats in the NE USA have experienced sudden and dramatic declines over the past three winters due to an emerging infectious disease dubbed "White Nose Syndrome" (WNS). As of January, 2012, new estimates of the number of bats that have died thus far range from 5.7 to 7.7 million, and the causative agent is now known to be the cold-loving fungus *Geomyces destructans* (Gd). **This proposal seeks to address these declines by developing and implementing methodologies to combat WNS, which was specifically referenced in the call for proposals.**

Progress Achieved: (For each Goal/Objective, list Planned and Actual Accomplishments)

The overall goal of this project is to develop and test potential treatments for WNS and, if possible, to optimize field treatment protocols. Tasks include:

1. **Testing potential treatments for efficacy against cultured Gd (the fungal pathogen associated with WNS) under laboratory conditions.**
2. **Testing potential treatments for safety in healthy bats.**
3. **Testing potential treatments for efficacy against Gd in hibernating bats. Trials will primarily be conducted under strictly controlled conditions in a captive setting, in which microclimate is tightly controlled and in which each bat's behavior can be tracked. Limited, highly selective field trials will also be conducted.**

Planned and Actual Accomplishments:

1. **Formulations of terbinafine and other anti-fungal compounds are being tested for activity against Gd in the Ghannoum and Barton laboratories**
2. **Safety testing of treatments in healthy bats is being assessed from control animals in our experiments.**
3. **UV photos (for detection of active infection) revealed that our study bats did develop lesions characteristic of WNS. It is clear that the drug voriconazole causes significant mortality in hibernating bats, and continued studies of this drug will not occur. However, the drug terbinafine did not appear to cause such mortality and slow-release implants of terbinafine look relatively promising for both field and captive trials. Dr. Marci Souza at the University of Tennessee is a new partner in this work. Field and captive trials using terbinafine implants were initiated with bats from a WNS positive site in Kentucky in late November and early December (with captive animals being given additional Gd inoculations) of 2012. Trials continued through spring 2013. Unfortunately, we experienced significant mortality in both captive and field infected animals. In March 2013 remaining study bats were euthanized for necropsy and comparison with those that already died. Analyses are ongoing.**
4. **Development of assays that will be used to assess overall health in control and treated bats is ongoing, and a number of assays now appear to provide useful information about immune status in bats, including: a phagocytosis assay that measures the ability to recognize and destroy foreign pathogens via macrophage**

white blood cells, a bactericidal assay that measures the ability to recognize and destroy foreign pathogens via the innate complement system, and an assay of total antibody levels.

Difficulties Encountered:

No major difficulties are reported this quarter.

Activities Anticipated Next Quarter:

During the next quarter we continue our detailed analysis of necropsy results, survivorship, and drug tissue levels. We will continue to make plans for any experiments that we deem warranted for the hibernation season of 2013-2014. We have also requested a no cost extension to expand the scope of the project and complete some ongoing work.

Costs:

Are you within the approved budget plan? **Yes – although we are underspent to date in most budget categories.**

Are you within approved budget categories? **yes**

Signature:

Date: 10/15/2013