NORTHEAST REGIONAL CONSERVATION NEEDS GRANT 2015 PROGRESS REPORT

Quarter: (circle one) (2015 1st) 2015 2nd 2015 3rd 2015 4th

Grant Program, Number and Title: Regional Conservation Needs Grant 2013-01. Developing a coordinated research approach for hellbender conservation in the northeast region

Organization: Smithsonian Institution (primary organization)
Participating organizations: Western Pennsylvania Conservancy, Maryland Department of Natural Resources, Virginia Department of Game and Inland Fisheries, Buffalo State University, The Wilds

Project Leader: Kimberly Terrell, Ph.D.

Abstract: Please provide a short (1-2 paragraphs) abstract that addresses EACH of the following: the objectives of your project, accomplishments to date, future plans and timelines with an estimate for when the project will be completed.

Were planned goals/objectives achieved last quarter?

Yes. This past quarter we focused on extracting the eDNA samples collected in 2014 and optimizing the real-time PCR protocol.

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

1) **Fill major data gaps in hellbender distribution throughout the northeast**

   We are in the process of extracting and analyzing eDNA samples collected in 2014. As of March 2014, we have extracted DNA from 249 out of a total of 318 samples (representing 106 total sites). We plan to complete these extractions by the end of May 2015 and to have all 2015 samples analyzed by June 2015.

2) **Develop efficient, standardized protocols for hellbender research and monitoring**

   Dr. Amy McMillan and Robin Foster (Buffalo State) and Dr. Joe Greathouse (The Wilds) worked together to troubleshoot and optimize the real-time PCR protocol for eDNA analysis. They determined the cause of some inconsistencies in their data (described below). This extra effort will substantially improve the quality of our data, as well as the relevance of the project's findings.

Difficulties Encountered:
This quarter we encountered significant difficulties related to PCR analysis of the eDNA samples. Although both Dr. McMillan and Dr. Greathouse were using a standardized protocol, their PCR amplification curves were not consistent, even when analyzing the same samples. The ability to obtain consistent eDNA results is essential to comparing data across states and making broader inferences about wild hellbender populations. To address this issue, Robin Foster traveled to Dr. Greathouse's lab to work directly with him to determine the cause of the inconsistencies. After substantial troubleshooting, they determined that the difference was related to the heating element of the PCR machines. The newer machine used by Dr. McMillan warmed up very quickly, resulting in a higher-than-optimal temperature during a critical step of the PCR process. The difficulty illustrates the importance of communication between eDNA researchers. If Dr. McMillan had simply followed the protocol

developed by Dr. Greathouse, her data quality would have been suboptimal and hellbender eDNA from low-density sites would likely have gone undetected. We will continue to work together to ensure that our results are robust and comparable.

Activities Anticipated Next Quarter: Project partners will meet in-person in June 2015 to discuss the results of the 2014 sampling season and to plan sample collection for fall 2015.

Expected End Date: 31 Dec 2015

Costs:

Total life to date expenses (include this quarter): $52,335.65

Total Approved Budgeted Funds:$99,886.00

Are you within the approved budget plan and categories? Yes

Signature: 

Date: 15 May 2015