ABSTRACT

Grant Number: 2009-04

Grant Title: Development of Noninvasive Monitoring Tools for New England Cottontail Populations: Implications for Tracking Early Successional Ecosystem Health

The overarching goal of this project is to develop new noninvasive tools for monitoring the status and effectiveness of conservation actions for the New England cottontail, a Species of Greatest Conservation Need in the Northeast. This project addresses RCN Priority 6: Development of Regional Indicators & Measures. Our specific objectives are to 1) conduct a systematic study of detection rates and factors that influence detection of New England cottontail occupancy in order to evaluate the effectiveness of the current presence/absence survey protocol; 2) develop a noninvasive genetic monitoring technique for population estimation and apply it to generate baseline estimates of New England cottontails on several sites range-wide; 3) conduct pilot investigations for developing a pellet count index. End products will include an evaluation of current presence/absences survey protocols, guidelines for implementing effective new monitoring approaches, and the first, baseline population estimates for New England cottontails range-wide. In the first year of the project, an initial field season targeted 26 sites in Maine, 9 sites in NH, 7 sites in NY, and 6 in MA. Due to an unusually mild winter with very little snow precipitation, survey visits were insufficient for an analysis of detection, but provided insight into optimal sampling for detection, including sites with sympatric eastern and New England cottontails. In the second field season of the project, detection data were thoroughly collected (4-6 visits) from 26 sites in Maine (only 15 were occupied), 7 in NY, 6 in NH, 10 in CT; and an additional 2 visits to 4 sites in MA. Exhaustive surveys for population estimation were conducted on 11 sites in ME, 6 in NY, 5 in NH, 1 in CT and 1 in MA. Species identifications are now completed and NEC were not detected on a subset of sites in NY and CT. 310 samples collected for population estimation have been genotyped to determine unique individuals from multiple patches range-wide. The next quarter's efforts will focus on mark-recapture population estimation and occupancy modeling in the program PRESENCE to determine the factors that influence detection. The project will be completed December 2011 and a final report will be prepared by March 31, 2012.

NORTHEAST REGIONAL CONSERVATION NEED GRANT
QUARTERLY REPORT

Grant Number: 2009-04

Grant Title: Development of Noninvasive Monitoring Tools for New England Cottontail Populations: Implications for Tracking Early Successional Ecosystem Health

Grant Receipt: January 15, 2010

Grant Contact Name: Adrienne Kovach

Report #: 2011 3rd Quarter (7th Quarter Total)

Were planned goals/objectives met last quarter? YES

Regional Conservation Need Addressed: RCN Priority 6: Development of Regional Indicators & Measures

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

1.) Evaluate the effectiveness of the current presence/absence winter survey monitoring protocol through a systematic investigation of detection rates; use this knowledge to develop an improved protocol for maximal detection of NEC on occupied patches.
Genetic analyses of samples for detection sites were completed in the previous quarter. During this quarter, data on covariates were compiled and preliminary analyses conducted for occupancy modeling in program PRESENCE. Further analyses of these data will be used to determine the factors that influence detection. An evaluation of the influence of detection on the surveys and recommendations for an improved survey protocol for optimal detection will be provided at the end of the grant period, or as soon as analyses are completed.

2.) Develop a noninvasive genetic monitoring technique for estimating the numbers of individuals occupying a habitat patch; apply this tool to measure baseline population levels on multiple sites throughout the range of NEC.
In this quarter, DNA extractions were completed for all population-monitoring sites; this totals 310 samples. These samples were genotyped at 11 microsatellite markers In the next quarter, mark-recapture algorithms will be used to generate patch-specific population estimates.

3.) Use the population estimates in (2) to develop a population index based on pellet counts; establish guidelines for implementing this tool throughout the range of NEC.
No work was conducted on this objective in this quarter. In previous quarters we piloted different approaches and concluded that pellet counts are not a viable approach for New England cottontails and we do not recommend that this be pursued further.

Summary of Progress: (Provide a paragraph describing progress, work to come, and timelines) To date, we completed two winter's survey efforts, although due to poor survey conditions in the first year, we are primarily relying on data collected during the second year. We completed genetic species identifications for the 265 pellet samples collected for the detection study in the first year and used our results to optimize sampling conditions for our second field season. In our second season, we collected a total of 984 pellets for detection and population surveys. We collected detection data from 49 sites range-wide during 4-6 surveys and have now completed genetic species identifications of the pellets collected from this effort (some 500); data from these sites will be analyzed to determine factors that influence detection. We established pellet plots on Stage Island and initiated a pilot study evaluating the utility of using pellet counts for a population index. However, due to high mortality, this pilot study had to be aborted. We identified two more polymorphic markers to increase the power of our genetic identification of individuals in Maine/New Hampshire and an additional two markers that are polymorphic in the other geographic regions of the species' range; this will be useful in our population estimation procedure. We used these markers in a pilot evaluation effort for several patches in Maine from which a large number of samples were collected in 2009 (prior to this grant). The precision of population estimates generated by this method will be evaluated by comparison with estimates generated from a systematic sampling scheme in our second field season. In the winter of 2010-2011, we (and our partners) surveyed 24 sites for population estimation and collected 310 pellets for this purpose. These samples have been genotyped at 11 microsatellite markers. In the next quarter, population estimates will be generated from these genotypes using mark-recapture algorithms.

Timeline for future work:
October – December 2011 –Final occupancy modeling with program PRESENCE to determine detection probabilities and factors that influence detection; population estimation with mark-recapture algorithms.
March 31, 2012 – Final report complete – with evaluation of optimal survey protocol and baseline population estimates for multiple sites throughout the species' range. Additionally, guidelines for implementing these monitoring tools through the range will be developed and included in the final report, based on the final results of the 2-year study.

Difficulties Encountered: None during this quarter.

Activities Anticipated Next Quarter: Occupancy modeling; mark-recapture population estimation; report writing.

Costs:

Funds expended previous to this report: $46,045.11
Amount of RCN funds requested within this report: $1375.35
Total approved budgeted RCN funds: $49,004
Are you within the approved budget plan: YES
Are you within approved budget categories: YES

Signature:

Date: October 24, 2011