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. NEC were not detected on a subset of sites in NY (2) and CT (6). Occupancy modeling approaches were used in the program PRESENCE to model the influence of survey conditions on NEC detection. Across the 30 sites with known occupancy, the probability of detecting a New England cottontail during a single visit was 0.73. Prior knowledge of New England cottontail activity, snow depth <12 inches and increasing pellet deposit days had a positive influence on detection probability. Overall our results indicate that if surveys are conducted under ideal conditions, occupancy can be determined with high confidence in 1-3 survey visits. Our results were provided to managers in a detailed report with recommendations for future monitoring. To address our population monitoring objectives, 310 samples collected for population estimation were genotyped to determine unique individuals from multiple patches range-wide. Population estimates have been completed and will be provided in a report at the end of January. This project was completed December 31, 2011. All objectives have been met, products related to objective 1 have been delivered, products related to objective 2 are forthcoming by the end of January, 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 4th Quarter (8th 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.
During this quarter, detection modeling was completed in the program PRESENCE, yielding an evaluation of the factors that influence detection of NEC during winter surveys. These results as well as recommendations for an improved monitoring protocol for optimal detection were provided in a detailed report to stakeholders. This objective has now been 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, genotyping of 310 samples were completed and used to identify unique individuals on 24 patches range-wide. Mark-recapture algorithms have been used to generate patch-specific population estimates. These results as well as an evaluation of different sampling approaches for population monitoring are being prepared into a document to be provided to stakeholders by the end of January 2012. With submission of that report, this objective will be completed.

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. In earlier meetings, stake-holders (supporting partners) were supportive of this decision.

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 completed genetic species identifications of the pellets collected from this effort (some 500). Of these sites, 30 yielded at least one detection in four or five attempts and were used in our detection modeling to determine survey conditions that influence detection. The results of these analyses were included in a report to managers, along with guidelines for improved monitoring for optimal detection. We identified increased our suite of polymorphic markers and used the expanded marker set to identify individuals in our population monitoring efforts. 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 were genotyped using 11 microsatellite markers and the data (capture/recapture histories) were used to generate population estimates. These estimates will be provided to managers in an upcoming report at the end of January. In this report we will also summarize the outcomes of our trials with different sampling approaches, including a comparison with our pilot efforts in 2010, and provide guidelines for a patch-specific population monitoring protocol. To address our third and final objective, we conducted several pilot efforts. 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 also trialed pellet plots on sites in Cape Elizabeth, ME, but due to the remarkably low rate of pellets we counted (despite a known high cottontail density), combined with the logistical difficulties of establishing plots in the dense thicket habitat, we determined that this was not a viable approach for monitoring NEC, and given support of our partners, we did not pursue this objective any further.
Timeline for remaining deliverables:
January 31 – Provide summary of baseline population estimates.
March 31, 2012 – Final report complete.

Difficulties Encountered: None during this quarter.

Activities Anticipated Next Quarter: None. Project is complete. Final reporting will be completed according to contractual agreement.

*Costs:

Funds expended previous to this report: $46,045.11
Amount of RCN funds requested within this report: $2448.87
Total approved budgeted RCN funds: $49,004
Are you within the approved budget plan: YES
Are you within approved budget categories: YES

Signature: Date: January 24, 2012

*These numbers are provided as an approximation. They may be slightly modified in a final expenditure report to be submitted by UNH after the grant closing process has been completed.