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 #: 2010 4th Quarter

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.
In the previous quarter, we completed genetic analyses of the 265 pellet samples that were collected from 25 sites in Maine, 9 sites in New Hampshire (only 6 had New England cottontails), 2 sites in Massachusetts and 7 sites in New York (only 3 had New England cottontails) in the first year of this study. Given the poor snow conditions, we were unable to conduct sufficient surveys for a statistical evaluation of detection rates, that is, we were unable to visit most sites >2 times. However, we did collect preliminary data which suggested that 1) there is some benefit to repeated surveys at least on some sites for which detection probably is <100%; and 2) on sites occupied by both eastern cottontails and New England cottontails, it is sufficient to collect 3-5 pellets per site to detect New England cottontails with high probability (93-98%).

Additional surveying in the second year of this study, winter 2010-2011, will be conducted to provide sufficient data to evaluate the effectiveness of the current presence/absence winter survey protocol and to determine the role of detection in monitoring New England cottontails. To this end, we have finalized arrangements with contributing partners in all participating states (ME, NH, MA, CT and NY; note, RI is the only state within the species' range not participating, due to lack of known occupied New England cottontail sites). With the help of our partners, we will conduct surveys for detection (at least 4 visits) on 24 sites in ME, 6-8 sites in NH, 10 sites in CT, 6-7 sites in NY, and 6-7 sites in MA. Surveys for population estimation (objective 2) will be conducted on 2-5 of these sites per state, except in ME where they will be conducted on 10-15 sites. 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.

During this quarter, site visits were made to meet with partners in New York (Paul Novak), Massachusetts (Eileen McGourty) and Connecticut (Howard Kilpatrick). During these meetings, survey protocols were discussed, sites finalized, and site boundaries mapped out. Similar discussions were also had with partners in New Hampshire (Heidi Holman, Emma Carcagno).

Preliminary results and overviews from this project were recently presented at a meeting of New Hampshire New England cottontail partners (~25 people in attendance; December 16, 2010) and a meeting of USFWS, UNH, URI and other biologists and managers (~12 people in attendance; December 18, 210). A presentation will be made at the Northeastern Fish & Wildlife Conference in April, 2011 in Manchester, NH.

Additionally, during this quarter, stem density counts were conducted on a number of sites in Maine, and a statistically verified double sampling protocol was established for estimating stem densities on remaining sites. This protocol was developed by Masters student, Daniel Brubaker, in consultation with Dr. Mark Ducey, UNH, and the method shared with all partners.

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 the previous quarter, we conducted pilot population estimates using data collected in Maine and New Hampshire during 2008-2009 (prior to the initiation of this project). Results are provided in Table 1. These results should be viewed only as preliminary, as the samples were not collected for the purpose of population estimation, yet they were collected with the intention of sampling multiple individuals. However, the pilot data do demonstrate the utility of our approach and the feasibility of generating estimates from single surveys. It is likely that the precision of the estimates will improve with an appropriate sampling protocol. To this end, from these data, we determined that the optimal inter-pellet collection distance is 50 m, to ensure a balance between resampling some individuals and obtaining sufficient new individuals. We used this knowledge to establish the population estimation survey protocol for the 2011 winter field season. As mentioned above in Objective 1, we finalized plans with range-wide partners for population estimation on 2-5 sites in MA, NY, CT and NH and 10-15 sites in Maine.

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.

For this effort, we were initially focusing on the unique opportunity to study the rabbits recently translocated to Stage Island. In early May, we established 50 pellet plots on the island, for a pilot study to evaluate the utility of using pellet counts as a population index. We had also collaborated with MIDFW on a mark-recapture (live-trapping) effort to estimate the number of rabbits remaining on the island. Unfortunately, the result of this effort in early November yielded only 3 rabbits remaining on the island. This small population (which might soon be removed from the island) is insufficient for the pellet count study. Thus, we are in the process of developing a new approach to address this objective. Our plan is to establish the transects and plots, while simultaneously counting pellets, during the spring on several of the same patches on which we will have conducted population estimates. This will enable us to calibrate the pellet counts with the population estimates.

Table 1. Pilot population estimates from select patches sampled during 2008-2009 surveys in Maine and seacoast New Hampshire. Genetic populations are: Cape Elizabeth (CE), Kittery/Wells east of I-95 (KE), and Kittery West (Elliot, Berwicks, west of I-95 and seacoast NH; KW).

STATE	Patch Name	Patch area (acres)	Genetic Population	# Pellets collected	# Unique genotypes	Point estimate (Confidence Interval)
ME	Cresent Beach/Kettle Cove	81.7	CE	27	13	23 (13-35)
ME	Sprague A	1.7	CE	5	3	5 (3-10)
ME	Sprague H	18	CE	13	7	12 (7-23)
ME	Dyer Pt.	7.6	CE	16	7	10 (7-18)
ME	Cresent Beach, south of parking lot	2.8	CE	2	1	1
ME	Two Lights SP	4.1	CE	8	1	1
ME	Sprague J West	21.3	CE	2	2	1
ME	Sprague J East	7.7	CE	3	2	2 (2-2)
ME	Sprague, Spurwink River South	9.3	CE	11	6	7 (6-10)
ME	Sprague I West	6.2	CE	4	3	5 (3-5)
ME	Sprague I East	4.3	CE	5	4	8 (4-8)
ME	Libby Field, Scarborough	17	CE	11	4	4 (4-4)
ME	Sprague, Spurwink River North	15	CE	12	9	25 (9-67)
ME	Sprague G	44	CE	22	15	25 (15-50)
ME	Scarborough WMA	6.7	CE	5	2	2 (2-2)
ME	Barber Easement	5.5	CE	3	2	2 (2-2)
ME	I-95 N, miles 2-3 powerlines	7.4	KE	8	1	1
ME	RCNWR, Braveboat Harbor	0.7	KE	6	2	2 (2-2)
ME	York Middle School	12	KE	14	5	5 (5-5)
ME	Fort Foster A,B	2.4	KE	2	2	6 (2-2)
ME	Frieze property	0.6	KE	3	2	2 (2-2)
ME	Wells Reserve	29	KE	9	3	3 (3-3)
ME	Wells Reserve, Northwest of field	8.4	KE	3	2	2 (2-2)
ME	I-95 S, miles 3-2 is this Haley farm?	25	KW	6	2	2 (2-2)
ME	Bartlett Lane	2.4	KW	6	1	1 (1-1)
ME	River Rd., Eliot, ME	4.3	KW	10	2	2 (2-2)
ME	Houde Rd. powerlines	7.2	KW	2	2	3 (2-3)
NH	Jet Line/ bus depot, Dover, NH	12.4	KW	6	3	5 (3-8)
NH	Dover Bus Depot- Dover, NH	11.5	KW	2	2	3 (2-3)
NH	Bellamy WMA - Durham, NH	11.4	KW	8	1	1
NH	Middle Rd. Powerlines/Radio Station	9.7	KW	20	5	5 (5-7)

Summary of Progress: (Provide a paragraph describing progress, work to come, and timelines) To date, we completed our first winter's survey efforts, although much of it will need to be replicated next year, due to poor survey conditions of this year. We completed genetic species identifications for the 265 pellet samples collected for the detection study and used our results to optimize sampling conditions for the upcoming field season. We have 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 has been 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 have 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 a rigorous study using systematic sampling scheme in our upcoming field season. In the winter of 2010-2011, we will focus intensively on sampling for population estimation. We will also conduct detection surveys on multiple sites throughout the species' range, with the help of range-wide partners. Stem density counts and estimates will also be conducted on these sites, as time permits, either during the winter survey period or in the early spring.

Timeline for future work:
December 2010 – April 2011 – Survey detection sites in Maine, NH, MA, CT, and NY.
April/May 2011 – establish and count pellet plots on select sites in Maine and NH.
April – December 2011 – genetic analyses of Year 2 samples; analyses for population estimation
March 31, 2012 – Final report complete – with evaluation of optimal survey protocol, pellet count index, 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.

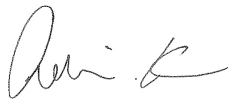
Difficulties Encountered: High mortality on Stage Island precluded use of this study site for the pilot development of a pellet count index.

Activities Anticipated Next Quarter: Detection and population surveys will be conducted. We will begin genetic analyses, time permitting.

Costs:

Funds expended previous to this report: $17,128.18
Amount of RCN funds requested within this report: $2844.34
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 9, 2011