

**Progress Report for the Project Titled:**

**USE OF TRANSMISSION LINE RIGHTS-OF-WAY AND NEW ENGLAND COTTONTAIL CLEARCUTS BY  
ADULT AND FLEDGLING SONGBIRDS DURING THE BREEDING AND POST-BREEDING PERIODS**

**Blake-Nuttall Fund Award:**

\$1,720

**Project Period:**

9/30/17 – 9/30/18

**Principal Investigator:**

Matthew D. Tarr, PhD  
Extension Professor, Wildlife Specialist  
University of New Hampshire Cooperative Extension  
131 Main Street  
216 Nesmith Hall  
Durham, NH 03824  
603-953-4425

**Introduction**

The progress report was prepared by Matt Tarr (Principal Investigator) and Erica Holm (M.S. student, University of New Hampshire) and it provides a summary of tasks completed between September 2017 and September 2018 on the project titled *“Use of transmission line rights-of-way and New England cottontail clearcuts by adult and fledgling songbirds during the breeding and post-breeding periods”*. This project received a total of \$1,720 from the Blake-Nuttall Fund and those funds were used to provide partial support (\$6,200 total cost) for a full-time, summer research technician position for one University of New Hampshire undergraduate student during summer 2018.

All project tasks that were scheduled for this one year period (Sept 2017-Sept 2018) have been completed as proposed. We are currently analyzing data that will form the basis of one UNH M.S. Thesis that will be submitted as a final report to the Nuttall Ornithological Club in May 2019.

**Tasks PROPOSED in our 2017 proposal to the Blake-Nuttall Fund**

We proposed to use Blake-Nuttall funds to support an undergraduate research technician who would assist our research team conduct the following tasks in 2018 as part of the 2<sup>nd</sup> year of a two-year study investigating songbird use of shrubby transmission line rights-of-way (ROW) and clearcuts in southern Maine and NH:

- Conduct mist-netting surveys of adult and juvenile shrubland-dependent and mature-forest-dependent birds in a total of 12 transmission ROW and 6 clearcuts (for a total of 24 ROW and 12 clearcuts to be sampled between our 2017 & 2018 field seasons).
- Quantify fruit abundance, vegetation composition, and vegetation structure at each mist net location at each study site.

The following timeline from our 2017 proposal outlines tasks we proposed to complete at specific times following receipt of Blake-Nuttall funding in 2017:

Task	2017				2018								2019									
	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	
Identify field sites and secure site access	■	■	■	■	■	■	■	■														
Prepare study sites							■	■	■	■	■											
Conduct field research							■	■	■	■	■	■	■	■	■	■						
Data Analysis	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Present results at NE Fish & Wildlife Agencies Conference							■														■	
Report study results to NRCS		■													■							■
Final Report to Nuttall Ornithological Club																						■

**Tasks COMPLETED Sept 2017- Sept 2018 using Blake-Nuttall funds**

- Between October 2017 and April 2018, we identified and secured permission to access all study sites for the 2018 field season.
- Between March and May, 2018 we prepared field sites by positioning all of the poles for our mist net arrays to facilitate set up of mist nets during each survey (mist nets were set up for, and then removed after, at each survey).
- Between May and August 2018 we conducted field research that included mist netting surveys and vegetation sampling at each study site. The following provides accomplishments for each of those tasks:

### Mist netting surveys

Between May 18 and Aug 19, 2018, we conducted constant-effort mist netting surveys for songbirds at a total of 16 transmission ROW and six clearcuts in southern ME and NH (Table 1). All clearcuts were  $\geq 10$  ha in size. Transmission ROW sites included: three 50 m wide ROW maintained by mowing, five 70 m wide ROW managed with selective herbicide, three 70 m wide ROW mowed 2-3 years prior to 2018, and five 70 m wide ROW mowed 0-1 year prior to 2018. Mist-netting surveys were conducted a total of six times at each site, with consecutive surveys at the same site conducted about three weeks apart. At each survey, nets were opened  $\frac{1}{2}$  hour before sunrise and they remained open for a total of four continuous hours. A total of 8 nets were positioned in each ROW (Fig 1) and 9 nets were positioned in each clearcut (Fig 2), to sample as much of each site as possible. Nets were 12m long x 3m tall and had a 30mm mesh. Nets at each site were numbered uniquely to compare bird capture rates to net position within the site and to fruit abundance vegetation conditions we estimated at the net. Each site was staffed by an experienced bird bander and by two research technicians who extracted birds from each net every 15 minutes and transported birds to a portable banding station located central to the nets at each site.

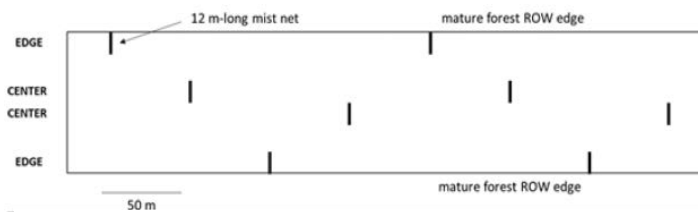


Figure 1. Position of mist nets in transmission ROW.

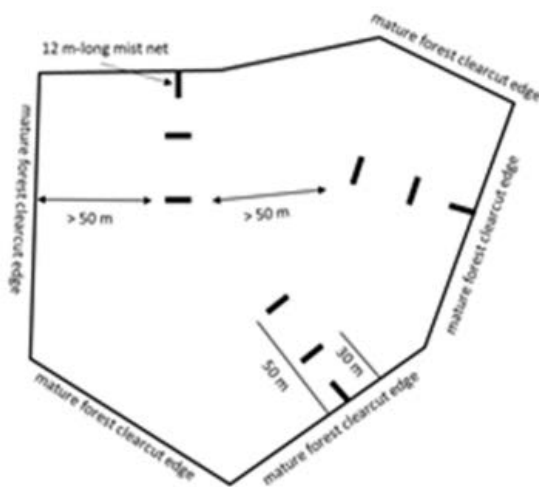


Figure 2. Position of mist nets in clearcuts.

Table 1. Clearcut and transmission line right-of-way (ROW) study sites where mist netting surveys for songbirds were conducted May-Aug 2018.

Site Name	Category	Location
Burley	clearcut	Epping, NH
Longmarsh	clearcut	Durham, NH
Merrimack	clearcut	Boscawen, NH
Terninko	clearcut	Nottingham, NH
Two Rivers	clearcut	Epping, NH
Tamposi	clearcut	Barrington, NH
Church Street	ROW 50m	Deerfield, NH
Taylor	ROW 50m	Fremont, NH
Pembroke	ROW 50m	Pembroke, NH
Deacey	ROW herbicide	Arundel, ME
McKenney	ROW herbicide	Saco, ME
Sanford	ROW herbicide	Wells, ME
Webber	ROW herbicide	Kennebunk, ME
Wire	ROW herbicide	Wells, ME
Beech Hill	ROW – mowed 2-3 years ago	Madbury, NH
Cate	ROW – mowed 2-3 years ago	Deerfield, NH
Stevens Hill	ROW – mowed 2-3 years ago	Nottingham, NH
Cross	ROW – mowed 0-1 years ago	Sandown, NH
Fremont	ROW – mowed 0-1 years ago	Sandown, NH
GH Carter	ROW – mowed 0-1 years ago	Danville, NH
Sinnote	ROW – mowed 0-1 years ago	Kingston, NH
Difficult	ROW – mowed 0-1 years ago	Danville, NH

The following data were collected from all birds captured (except ruby-throated hummingbirds that were released at the net after recording their sex and the net where they were captured): species, sex, age, weight, tarsus length, unflattened wing cord length, breeding status (presence/absence of cloacal protuberance or brood patch), and net # where they were captured. All birds were banded with a numbered, aluminum US Geological Survey band and released. Birds were banded so we could estimate bird abundance at each site; we noted when banded birds were recaptured, but each banded bird was counted only once for abundance estimates.

We captured and banded a total of 2742 individual birds representing a total of 88 unique species, including 35 species we categorized as shrubland-dependent and 53 species that do not require shrubland habitats for nesting (Table 2).

Table 2. Complete list of bird species captured by constant-effort mist netting at 16 transmission line rights-of-way and six clearcuts in southern Maine and New Hampshire, May-Aug, 2018. Species codes are American Ornithological Union ALPHA codes. Category indicates the species is considered shrubland-dependent ("shrub") or not dependent on shrublands for nesting ("non").

<u>Species</u>	<u>Category</u>	<u>Species</u>	<u>Category</u>	<u>Species</u>	<u>Category</u>	<u>Species</u>	<u>Category</u>
AMRE	non	GCKI	non	SCTA	non	CSWA	shrub
AMRO	non	HAWO	non	SWSP	non	EATO	shrub
BANS	non	HETH	non	SWTH	non	FISP	shrub
BAOR	non	HOFI	non	TRES	non	GRCA	shrub
BCCH	non	HOSP	non	TUTI	non	HOWR	shrub
BHVI	non	HOWA	non	VEER	non	INBU	shrub
BLBW	non	LEFL	non	WBNU	non	LAWA	shrub
BLJA	non	MODO	non	WOTH	non	LISP	shrub
BLPW	non	MYWA	non	YBSA	non	MAWA	shrub
BRCR	non	NOFL	non	ALFL	shrub	MOWA	shrub
BTBW	non	NOPA	non	AMGO	shrub	NAWA	shrub
BTNW	non	NOWA	non	AMWO	shrub	NOCA	shrub
BWHA	non	OROR	non	BAWW	shrub	PHVI	shrub
CHSP	non	OVEN	non	BBCU	shrub	PRAW	shrub
CMWA	non	PIWA	non	BHCO	shrub	RTHU	shrub
DOWO	non	PIWO	non	BRTH	shrub	SOSP	shrub
EABL	non	PUFI	non	BRWA	shrub	TEWA	shrub
EAKI	non	RBGR	non	BWWA	shrub	VESP	shrub
EAPH	non	RBWO	non	CARW	shrub	WIWA	shrub
EAWP	non	RCKI	non	CAWA	shrub	WTSP	shrub
EUST	non	REVI	non	CEDW	shrub	YBFL	shrub
GCFL	non	RUGR	non	COYE	shrub	YEWA	shrub

Bird captures will be expressed for each species, each age class, and each bird category (shrubland-dependent/non-shrubland dependent) as capture rate per 100 net hours, with one net open for a total of 1 hour equal to “one net-hour”. This analysis is currently being conducted for our 2018 mist-netting data to standardize sampling efforts across all site types. Figure 3 uses *raw data* (total # unique bird captures) as an example illustrating how capture rates of shrubland-dependent and non-shrubland-dependent birds of each age-class (e.g., hatch-year “HY”/after hatch-year “AHY”/ and unknown age “U”) can be compared among site types.

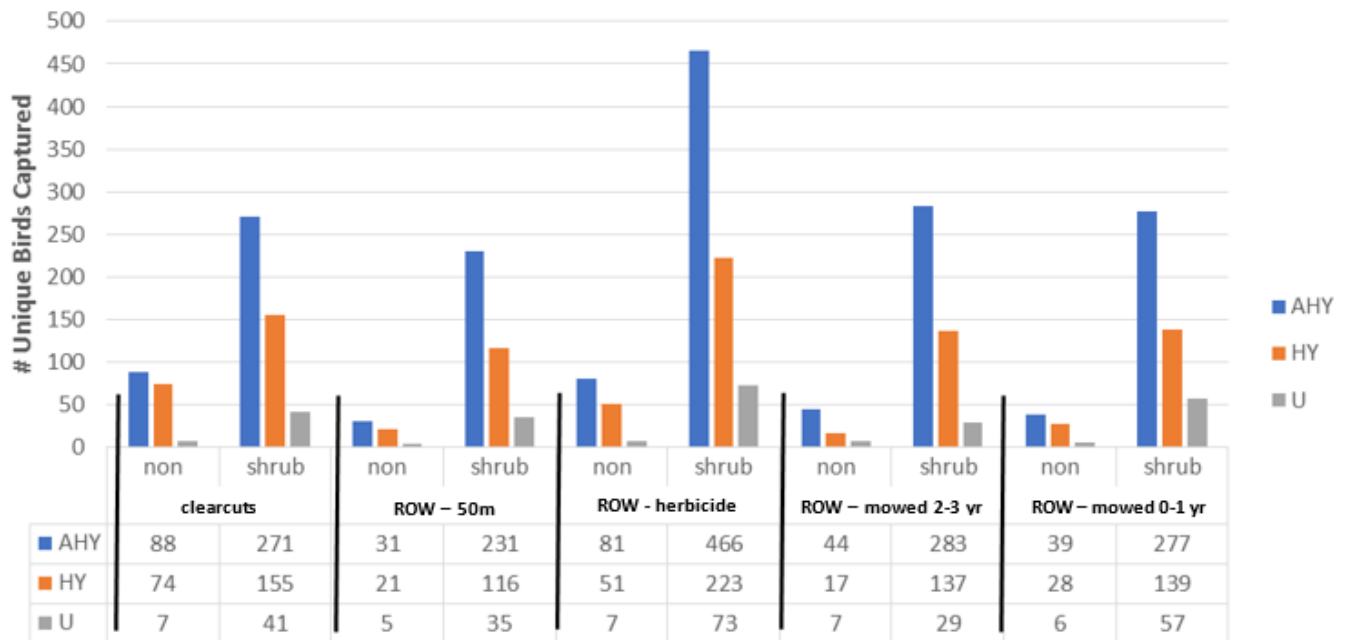


Figure 3. Number of unique captures of shrubland-dependent (“shrub”) and non-shrubland-dependent (“non”) birds of three age classes: hatch-year “HY”, after hatch-year “AHY”, and unknown age “U” among six clearcuts, three 50 m wide transmission rights-of-way (ROW), five 70 m wide ROW managed with selective herbicide, three 70 m wide ROW mowed 2-3 years prior to 2018, and five 70 m wide ROW mowed 0-1 year prior to 2018. Numbers below site names indicate the total number of birds of each category and age class captured at that site type. **NOTE: THESE ARE RAW DATA THAT HAVE NOT BEEN STANDARDIZED TO ACCOUNT FOR DIFFERENCES IN NUMBERS OF SITES OF EACH SITE TYPE SAMPLED OR FOR DIFFERENCES IN THE LENGTH OF TIME NETS WERE OPEN AT SITES – THE PURPOSE OF THIS FIGURE IS SIMPLY TO ILLUSTRATE HOW STANDARDIZED DATA MAY BE PRESENTED IN FINAL REPORTS.**

### Vegetation sampling

We quantified fruit abundance at each net immediately following each mist-netting survey (i.e., fruit abundance was quantified a total of 6 times at each net in 2018). Fruit abundance was estimated by tallying all fruit occurring within a 1 m x 12 m transect oriented parallel to and 1 m from both sides of each mist net (24 m<sup>2</sup> per net, Fig. 4). Fruit was tallied by species and categorized as ripe, unripe, or desiccated.

Vegetation composition and structure was estimated at 50 vegetation sampling points spaced 1.5 m apart within a 15 m diameter circular plot centered on each mist net (Fig. 4). We used a point-intercept method modified from Vitz and Rodewald (2006) to tally every leaf or stem contacting a 3m pole held vertically at each sampling point and recorded plants by species and the height at which they contacted

the pole. We conducted vegetation sampling following the 2<sup>nd</sup> and 5<sup>th</sup> mist netting survey at each site (about the first two weeks in June and the last two weeks in August) to account for seasonal differences vegetative growth. Across all nets, vegetation data was collected at a total of 9,100 sampling points.

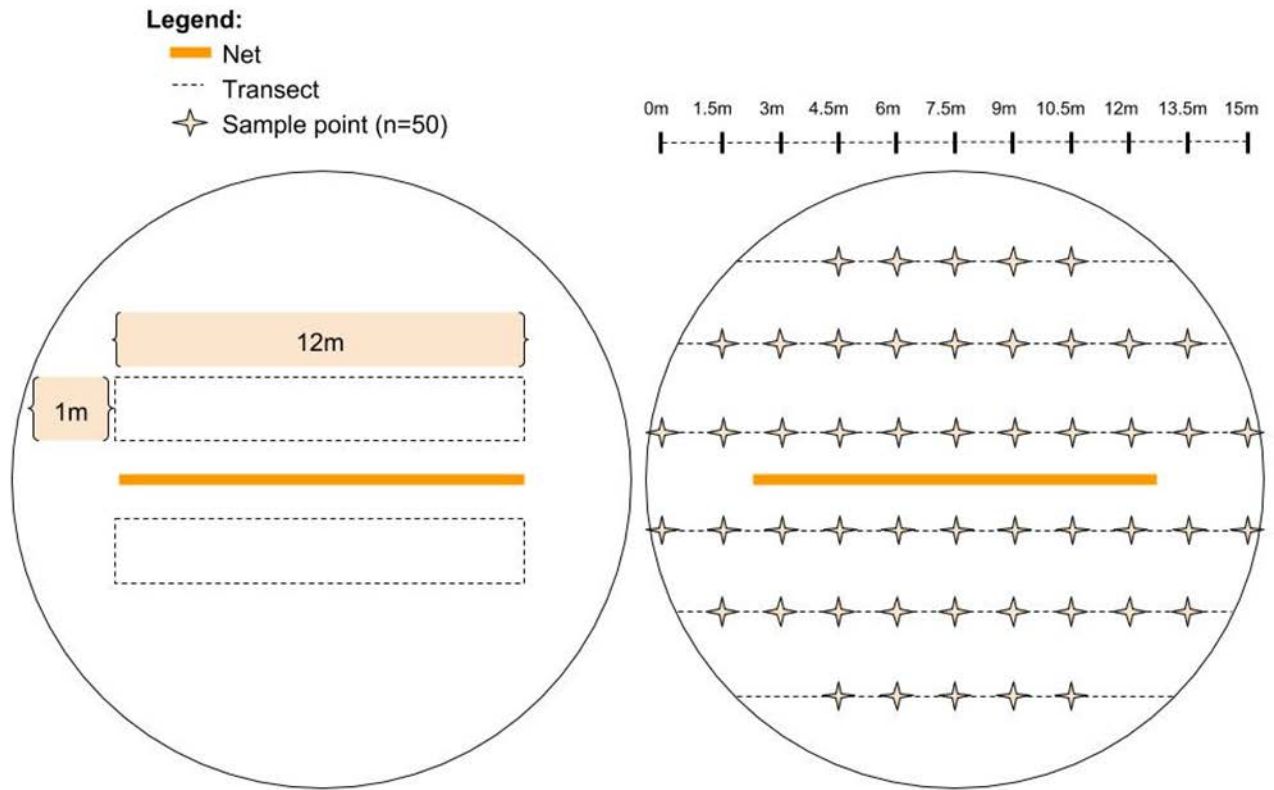


Figure 4. Design of survey plots used to quantify fruit abundance (left) and vegetation composition and structure (right) around each mist net.

**Additional tasks COMPLETED Sept 2017- Sept 2018 using Blake-Nuttall funds**

- DATA ANALYSIS;
  - Between October 2017 and February 2018 we analyzed the results of the mist net surveys we conducted in 2017 and entered all fruit and vegetation data in preparation for comparing 2017 bird captures rates to fruit abundance and vegetation composition and structure at each net.
  - Between June and September 2018 we have been regularly entering, quality checking, and compiling mist netting, fruit, and vegetation data collected in 2018.
  - Between September 2018 and May 2019 we will be conducting statistical analysis to compare captures rates of all birds among site types. We will also compare capture rates of shrubland-dependent and non-shrubland- dependent birds of each age class (hatch-year/after-hatch year) among site types and as a function of fruit abundance and vegetation composition and structure.
- PRESENTATIONS AT NORTHEAST ASSOCIATION OF FISH AND WILDLIFE AGENCIES CONFERENCE
  - In April 2017 we presented the preliminary results of our 2017 field season at the Northeast Association of Fish and Wildlife Agencies Conference in Burlington, VT and we plan to present the final results of our combined two year study at this same meeting in Groton, CT in April 2018.

- **REPORT STUDY RESULTS TO THE NATURAL RESOURCES CONSERVATION SERVICE (NRCS)**
  - NRCS is a funding partner on this project and in November 2017 we provided NRCS with a summary of project accomplishments completed by that date. We will be providing a similar progress report to NRCS in November 2018 for all project accomplishments by that date, and a final report of all project results and analysis in May 2019
- **FINAL REPORT TO NUTTALL- ORNITHOLOGICAL CLUB**
  - We anticipate to have a complete final project report in the form of a M.S. Thesis completed by May 2019. We will forward that complete report to the Nuttall-Ornithological Club as our final project report at that time.

**We greatly appreciate funding provided through the Blake-Nuttall Fund!**

**These funds allow us to accomplish research we would not be able to accomplish otherwise and they allow us to provide unique professional development opportunities to promising undergraduate students pursuing professional degrees in the natural resources field.**

**Erica Holm, the graduate student leading this project, was supported through a Blake-Nuttall grant received by Matt Tarr in 2015 when Erica was an undergraduate student at UNH.**

**That opportunity provided Erica with research experience that ultimately lead to her being hired for a graduate position leading this project that originated from work completed during that original Blake-Nuttall grant.**

**THANK YOU!**