PROGRESS REPORT #2 (Nov. 21, 2010).

Title: Singing Behaviors of Golden-cheeked Warblers as a Function of Territory Density: the Ecological Basis of the Relationship Between Population Density and Warbler Detectability.

James R. Ott and Floyd W. Weckerly
Department of Biology, Texas State University – San Marcos, Texas 78666

In summer 2009, Drs. J. Ott and F. Weckerly were funded by COA to conduct research aimed at understanding whether the singing behavior of male GCWA's is affected by the density of conspecific males. This field-based research project again used the six 1km sq. grids centered on the COA's 100-ac long-term study plots. The overall goal of the research has been to determine whether the apparent relationship between estimated warbler density and song rate (uncovered by previous research conducted by Warren, Ott, and Weckerly) is in fact due to a change in the behavior of individual singing males in response to the number of local territorial males. This report provides a summary of progress toward meeting the objectives of the study. Herein we present A) a general summary of progress, B) a timeline for completion of the project, C) a description of the structure of the data that has been gathered, and D) Preliminary analyses.

A) General summary of progress

This project is described fully in the attached file (GCWA focal male proposal Ott.doc). The fieldwork for this project was conducted in the spring 2010. Individual males were followed and the singing of focal males was recorded for one or more 20-minute sessions throughout the mating season on selected COA-BCP properties. Mr. Chris Warren conducted all fieldwork. The project was successfully implemented as a subset of males resident on each of the BCP properties were localized and selected as focal males. These males were identified by color bands and then followed and recorded. The subset of males followed on each property represents a reasonable sample of the known resident males on each study plot. During summer and fall 2010 recording from all males and from all BCP properties were reviewed and data was

tabulated. Thus as of November 2011 all raw data collection for this project has been completed. Data analysis will relate information on focal male singing behavior to plot-level density estimates of male GCWA. In November 2010 estimates of 2010 plot-level density estimates, and final individual color-banded males/plot was provided by BCP biologists to Ott et al. Thus we are now positioned to initiate our analysis.

B) TIMELINE for project completion

* Data analysis for this project is in the initial stages.
* Data is being proofed.
* Males with questionable ID status are being resolved.

Preliminary analyses were conducted on the response variables in fall 2010 using recently obtained 2010 territory density information. The final analysis will be proofed and presented in a final version by May 2011. We received the 2010 data from BCP biologist in Nov. 2010.

The research forms the basis of the Master of Science Degree for Mr. Christopher Warren —the student supported by the funds provided by COA. Mr. Warren has been meeting regularly with Dr.'s Weckerly and Ott to review, verify, interpret, and extend results for all aspects of the project. Mr. Warren is currently on track to complete all aspects of analysis and interpretation of results and produce a thesis by the target deadline of May 2011. The thesis now exists in draft form and will be finalized and defended in May of 2011. The thesis will constitute the basis for the final report for this project. Thus a final report can be provided to COA by May 2011.

C) a description of the structure of the data that has been gathered.

Summary of Collected Data

2010

Site	# Banded Males with mapped territories	#NB males with mapped territories	# Banded Males w/o mapped territories	# NB w/o known territories	N for near neighbor analysis	N for plot density analysis
BC	5	2	0	3	7	10
BO	3	0	0	1	3	4
CC	3	0	1	1	3	5
FR	5	3	0	2	8	10
JT	3	0	0	0	3	3
SE	3	3	2	4	6	10

Site	# Banded Males with mapped territories	# Recorded > 1x	# Recorded > 2x
BC	5	2	0
BO	3	2	1
CC	3	1	0
FR	5	1	0
JT	3	3	1
SE	3	1	0

D) Very preliminary results (Data has yet to be satisfactorily proofed. Interpret with caution)

Obj. 1) Does the rate of singing correlate with variation in plot density of GCWA?
Answer: No (Figure 1)

Figure 1. Song rate (mean number of songs per 5-minutes) by the number of territories per study plot. Values represent the mean number of songs per 5-minutes of each 20-minute recording. Values from males recorded more than once throughout the season were averaged. Each dot represents the song rate of an individual male.

Obj. 2) Does the rate of singing correlate with variation in the number of neighboring male territories?
Answer: No (Figure 2)

Figure 2. Song rate (mean number of songs per 5-minutes) by the number of neighboring male territories. Values represent the mean number of songs per 5-minutes of each 20-minute recording. Values from males recorded more than once throughout the season were averaged. Each dot represents the song rate of an individual male. Neighboring territories were defined as any territory whose border (defined by COA-estimated minimum convex polygons) was within 100 m of a focal male's territorial boundary.

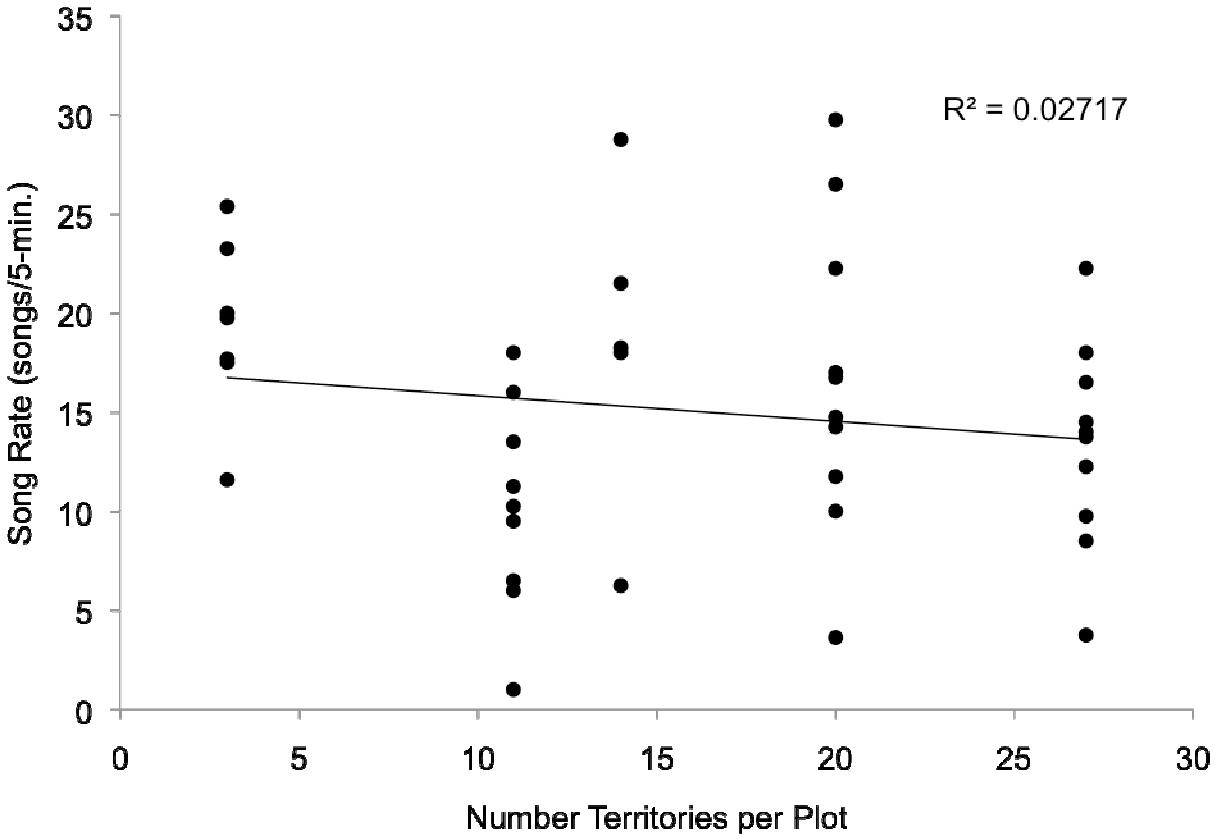
R² = 0.02717
Song Rate (songs/5-min.)
Number Territories per Plot
0
5
10
15
20
25
30
35

Fig. 1

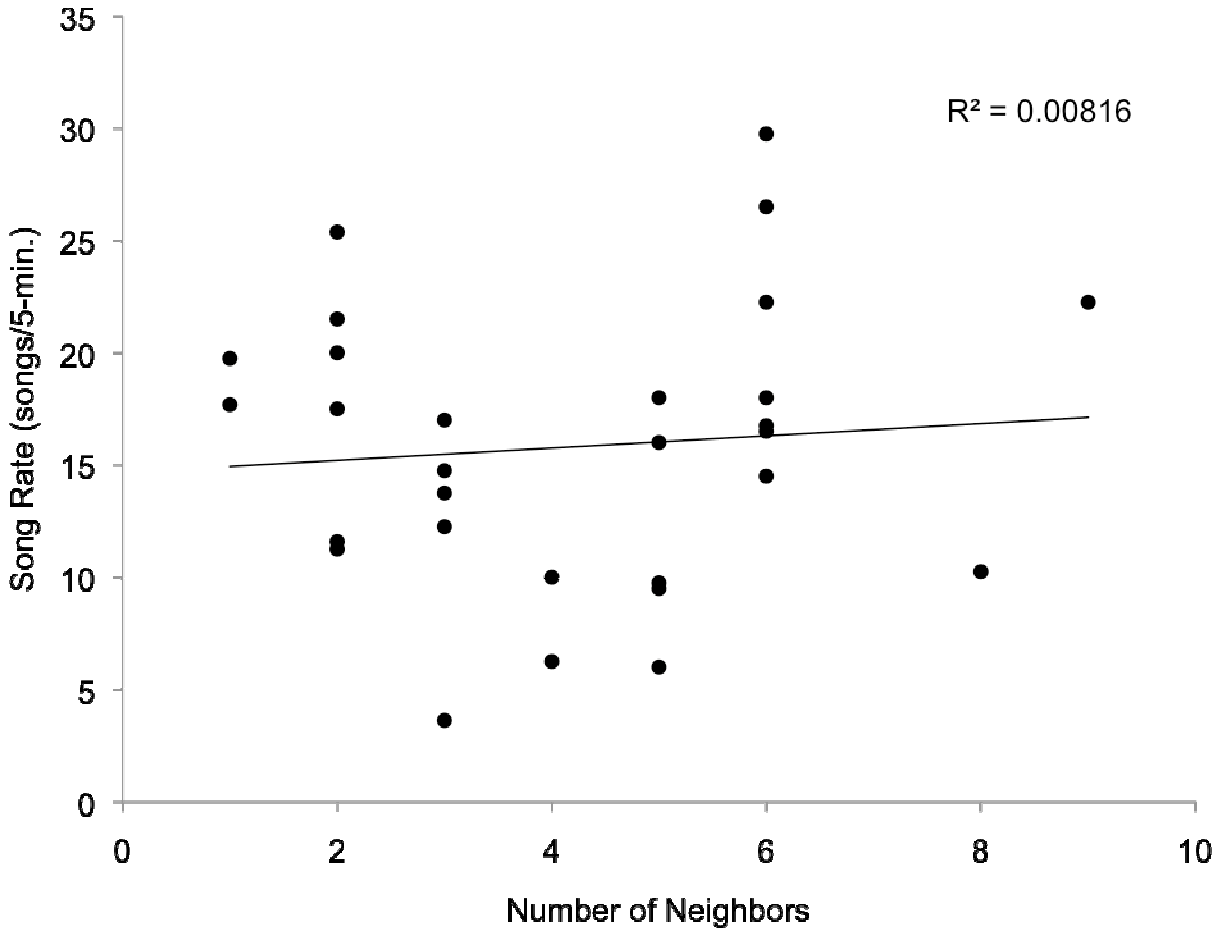
35
30
25
20
15
10
5
0
Song Rate (songs/5-min.)
R² = 0.00816
0
2
4
6
8
10
Number of Neighbors

Fig. 2.