

## Project Summary:

Traci Ballance and I monitored all of the boxes located previously installed by HPAS in Highlands, Cashiers, Sapphire and Glennville with a few exceptions. We monitored all boxes regularly and recorded nesting activities for all species. Traci continued monitoring through July 2016. However, our study focused on Carolina chickadees (CACH) and monitoring efforts were more intense on any box with CACH activity.

The objective of our study was to determine how nest building behavior influenced incubation behavior and reproductive success. Therefore, as part of the monitoring of CACH nests we measured nest dimensions and incubation behavior using iButton thermal loggers. We monitored a total of 61 Carolina chickadee nests. Nests were checked weekly to determine 1<sup>st</sup> egg date, hatch date, fledge date. Further, we measured nestling 3-4 times over the course of the nesting period to determine growth rate. Reproductive success will be estimated by the number of successful nestling to fledge and how well they grew in the nest. Carolina chickadees are single brooded and will only nest one time per season even if they experience a nest failure. However, we monitored nests carefully to verify that CACHs did not re-nest in our population.

## Preliminary Results for CACH study 2016

### CACH Nest Fates

We had a total of 61 CACH nest starts, 30 fledged, 31 failed. The main source of failure was house wren predation/takeover (12 nests), followed by bear and other unknown sources of predation.

#### Nest Outcomes for CACH

- 5 Nests attacked by bears (causing failure in some but unknown in others)
- 1 EABL takeover
- 5 Nests failed for other unknown reasons
- 12 Nests failed due to HOWR predation/takeover
- 4 incomplete
- 2 partial fledge
- 1 TREE takeover
- 30 Fledge

### CACH Nesting Demography

Figure 1 shows the range of first egg dates for the 2016 nesting season for CACH that were monitored closely by Traci and I. The first two eggs (in two different nests) were laid on April 4<sup>th</sup>, the peak of nesting activity relative to first egg date was between April 19<sup>th</sup> and April 21<sup>st</sup>. The last first egg laid was on May 12<sup>th</sup> with a period of 8 days between the previous nests. An eight day lag may be indicative of a second nesting attempt or a very late first attempt.

Figure 2 shows the range of fledging dates for the 2016 nesting season. We feel confident in our estimates for fledging date since we were able to use iButton data to determine when nestlings left the nest. The first nests fledged on May 13<sup>th</sup>. The peak of nest fledging was between May 25<sup>th</sup> and May

28<sup>th</sup>. The latest nest fledged on June 15<sup>th</sup>. But, again the latest fledging occurred 8 days after the previous nest had fledged. An eight day lag in fledging represents the successful fledging of the latest nest for the season. It is unclear if this was a second nesting attempt or a very late nesting attempt.

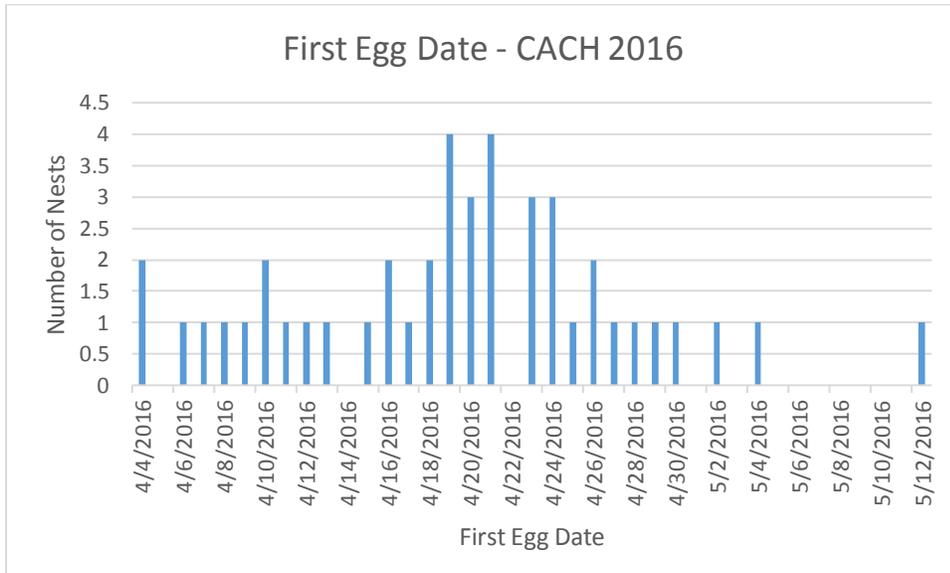


Fig. 1 First egg dates for CACH nests monitored for Traci’s project.

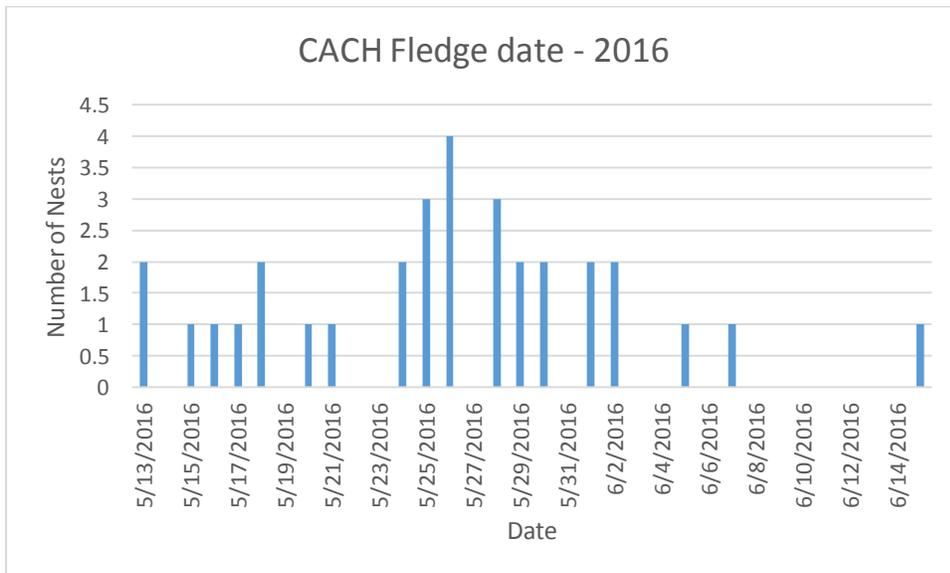


Fig. 2 Fledge dates for CACH nests monitored for Traci’s project.

**CACH Cavity Preferences:**

We found no evidence that cavity influenced box choice in Carolina Chickadees. They are just as likely to occupy an A size cavity as B size. In multiple cases, we had chickadees occupying both A and B of a single pair.

We found no significant difference in CACH occupation relative to cavity size (33 A boxes occupied; 28 B boxes occupied,  $\chi^2 = 0.365$ ,  $P > 0.05$ ).

We found no difference in cavity size of boxes occupied by CACH when the corresponding box of the pair (same number) was unoccupied. Although, there was a tendency for CACH to occupy boxes with "A" size cavities, the difference was not significant ( $\chi^2 = 2.6667$ ,  $P > 0.05$ ). However there was small sample of box pairs for which we could control for occupancy in both boxes of a pair ( $N=12$ ) that limit our ability to interpret this result.

Occupancy of boxes in which the corresponding box of the pair remained unoccupied.

4/12 without corresponding box occupied used B box

8/12 without corresponding box occupied used A box

### All Boxes - General Results

92 USED/128 monitored = 72% Occupancy

4 of the unused boxes had wasps/hornets

1 had a flying squirrel

1 had a grasses (maybe rodent nest?)

3 had a few sticks or pieces of moss

Occupancy analysis minus the boxes with other stuff 92 used/117 = 78% Occupancy

61 CACH

18 EABL

38 HOWR

12 TREE

1 TUTI

### Overall Conclusion

Carolina chickadees occupy the largest proportion of the boxes set up by HPAS, followed by house wrens and eastern bluebirds. Although we do not have complete data on nest fates for other species of birds that we monitored, it seems clear that Carolina chickadees faced larger rates of failure than other species due to house wren predation/takeover. We found no direct evidence of any second nests. However, there was on very late nest that could possibly be a second nesting attempt. The late nest was located in a previously unoccupied box. However, the other box in the pair had experienced a HOWR predation earlier. There was one case of brown-headed cowbird parasitism in which the eggs were buried. But, new CACH eggs were laid in the same nest, presumably by the same pair. We found no evidence of cavity size preferences in CACH. Traci is currently in the process of analyzing the data for nest dimensions, incubation, and offspring success and the results of those analyses will be the subject of future reports.