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## Patterns of Urban Hummingbird Nest Distribution on the LMU Campus

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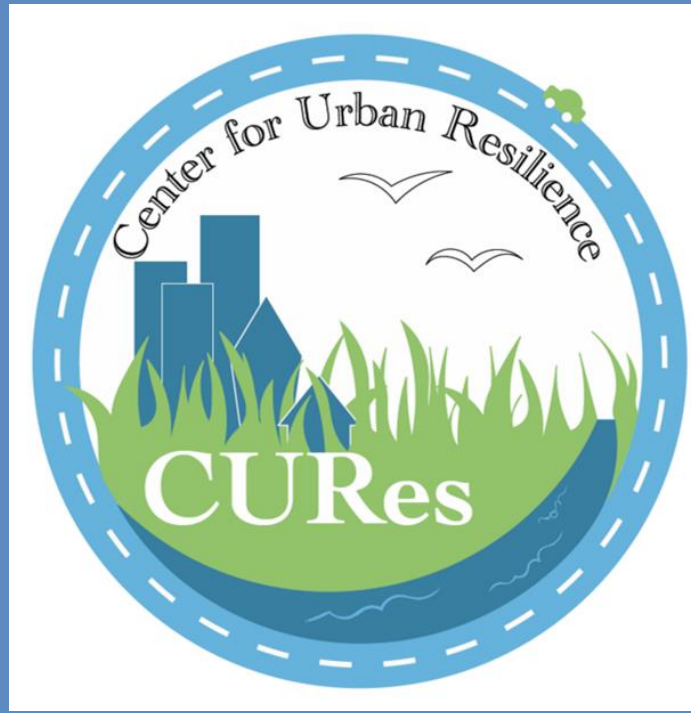
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# Patterns of Urban Hummingbird Nest Distribution on the LMU Campus

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Center For Urban Resilience | Loyola Marymount University | Spring 2017



## Abstract

Hummingbirds are among the most beautiful, acrobatic and mysterious animals in urban ecosystems, where these synanthropic species provide important benefits to humans such as pollination and biophilia. We plan to evaluate how various abiotic and biotic factors found in urban environments such as the LMU campus may affect hummingbird nesting patterns. Thorough nest searching throughout campus has revealed an apparent clustered distribution of nests, as well as patterns within the microhabitats of individual nests. We plan to complete a detailed inventory through standardized habitat evaluation and nest searching at Von Der Ahe, where a large number of active (15) and previously used (4) nests have been located (as of 3/20/2017). We predict variables such as shelter from rain and wind, vegetation density, and the proximity of flowers may increase the likelihood of nest site selection in a particular area. Determining where hummingbirds may preferentially nest in an urban environment will facilitate the location of active nests for investigation into hummingbird nesting behavior and physiology and also define landscape habitat attributes that will enhance hummingbird presence.

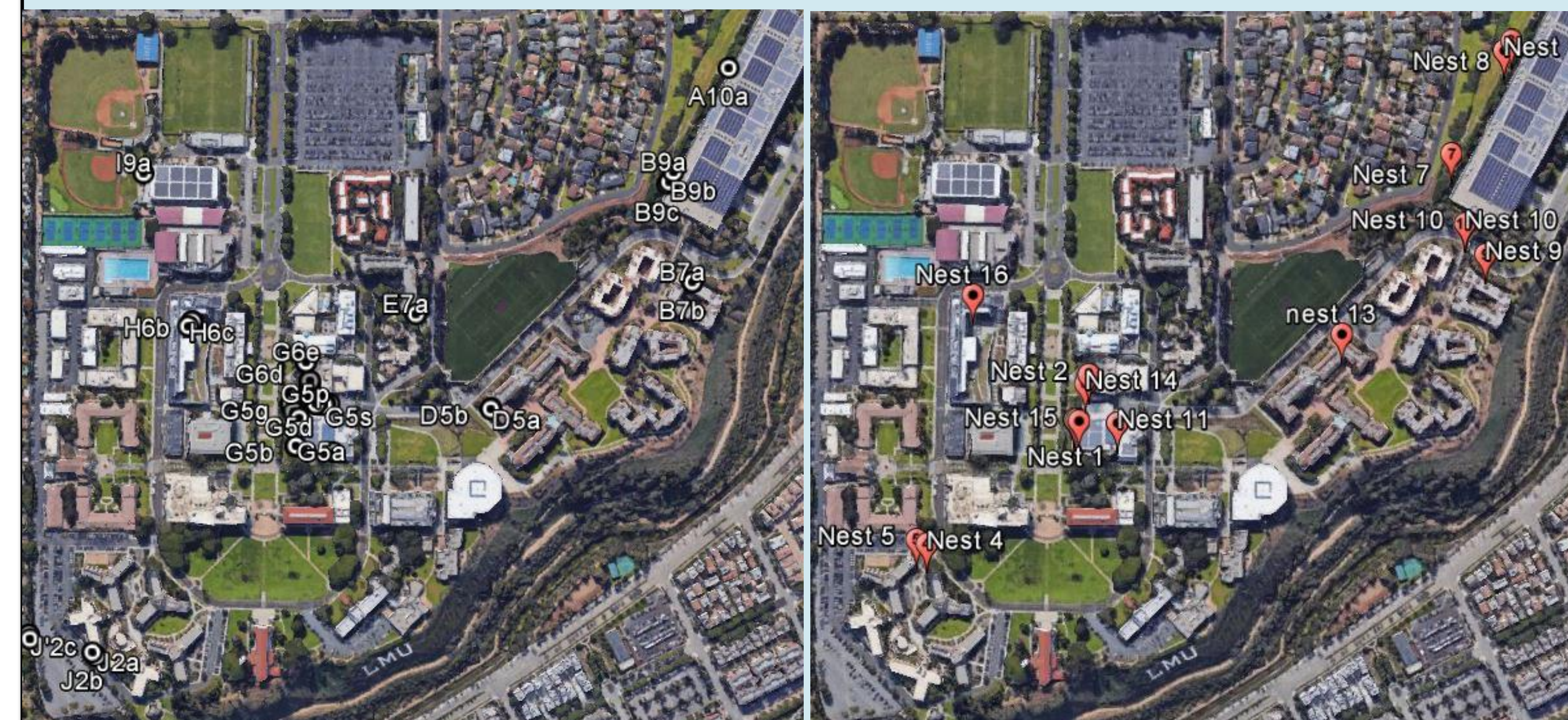
## Introduction

- Urban environments provide numerous benefits to hummingbirds including feeders, anthropogenic flowers, and nesting sites.
- Allen's Hummingbird (*Selasphorus sasin sedentarius*) breeds during the winter months in Los Angeles (Clarke 2017)
- Between 2012 and 2016, five active hummingbird nests were discovered and monitored on the LMU campus.
- Subsequent nest searching on campus revealed 45 previously used nests.
- Initial observations indicate that the nests are in close proximity to other nests and to built structures.
- Question:** How are hummingbird nests distributed throughout the LMU campus?
- Hypothesis:** The distribution of hummingbird nests across the LMU campus will show a clumped pattern.

## Methods

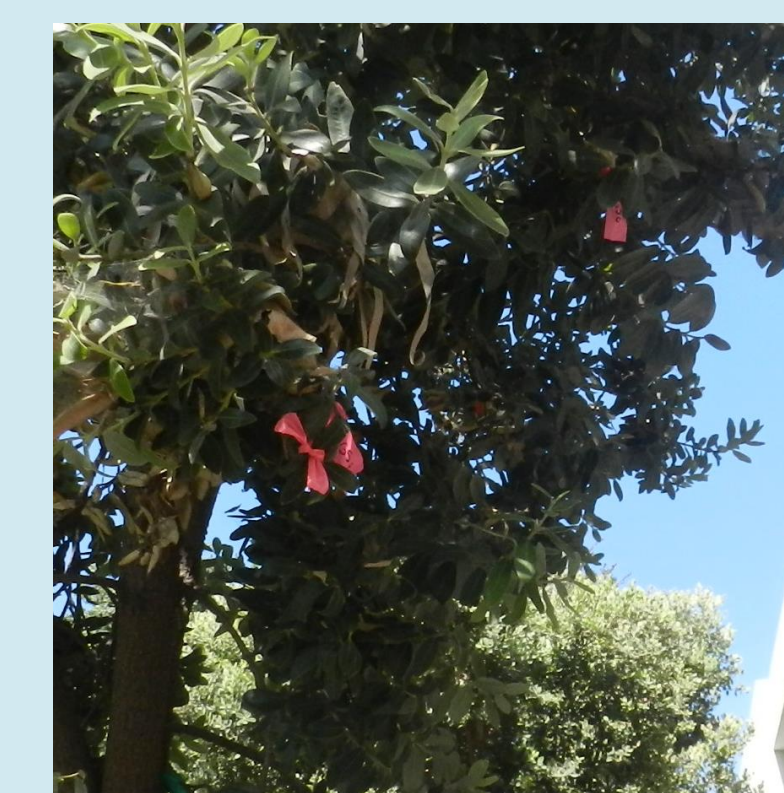
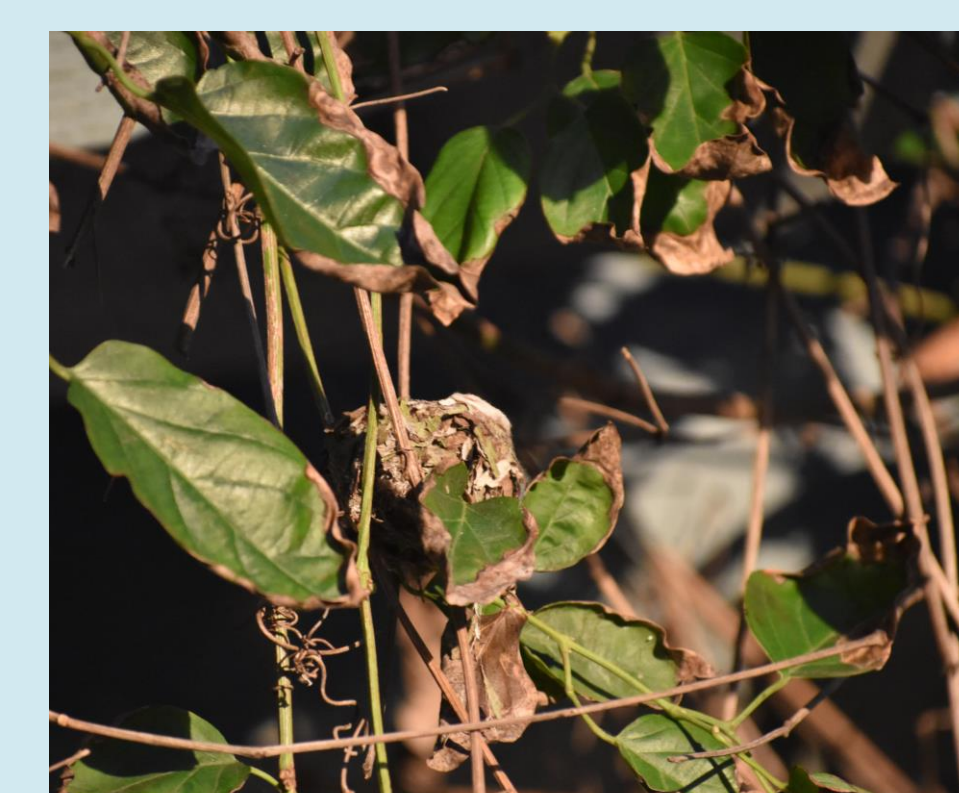
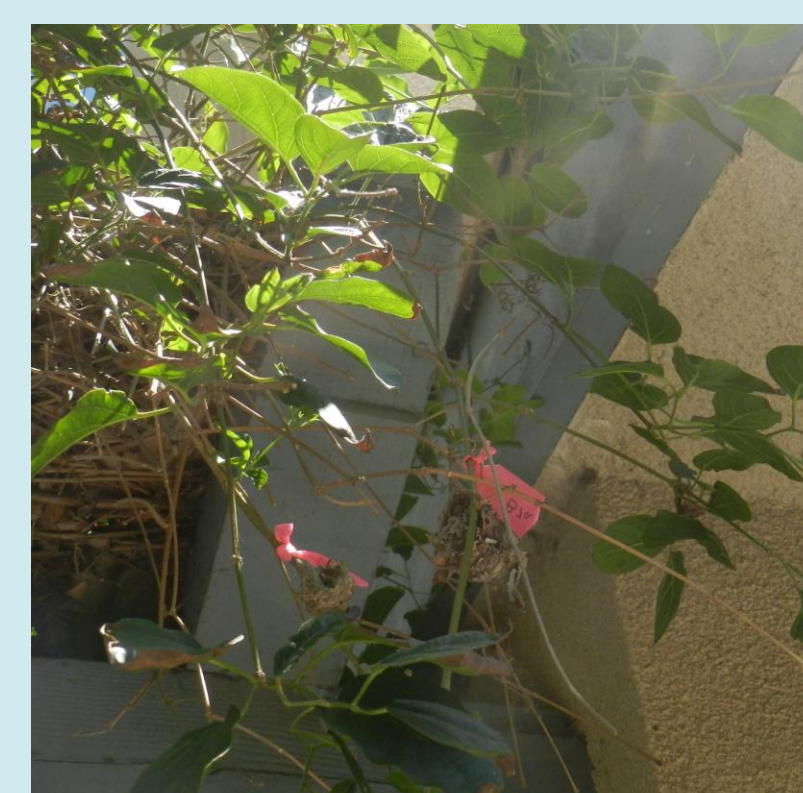
- Areas around prior nest locations are continually searched.
- Weekly searches began Jan. 17, 2017.
- Searches are completed thoroughly, branch by branch.
- Experience with trains the eye to notice nests.
- New nests are added to the distribution maps.
- Search patterns are updated to include new areas that may have nests.

## Data



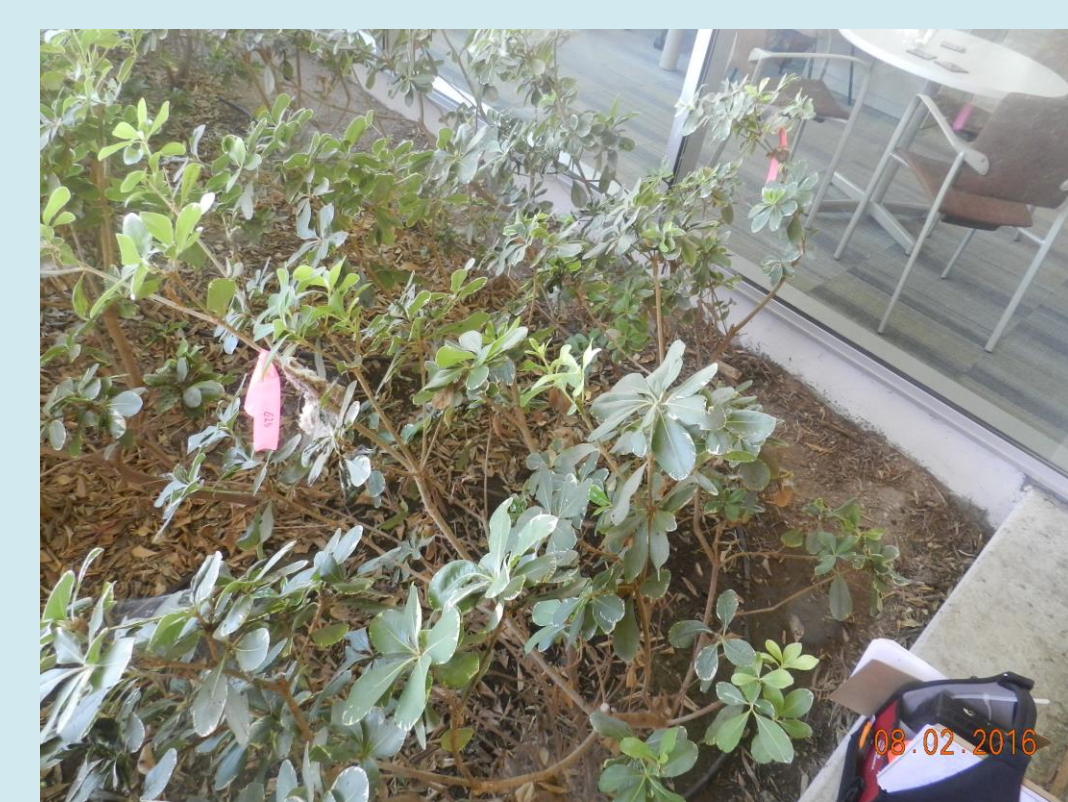
2016: Figure 1. Recorded Nests

2017: Figure 2. Nests Found While Active



2016 (Left) 2017 (Right) Figure 4. New Nest Found by Old Cluster at Leavy 5

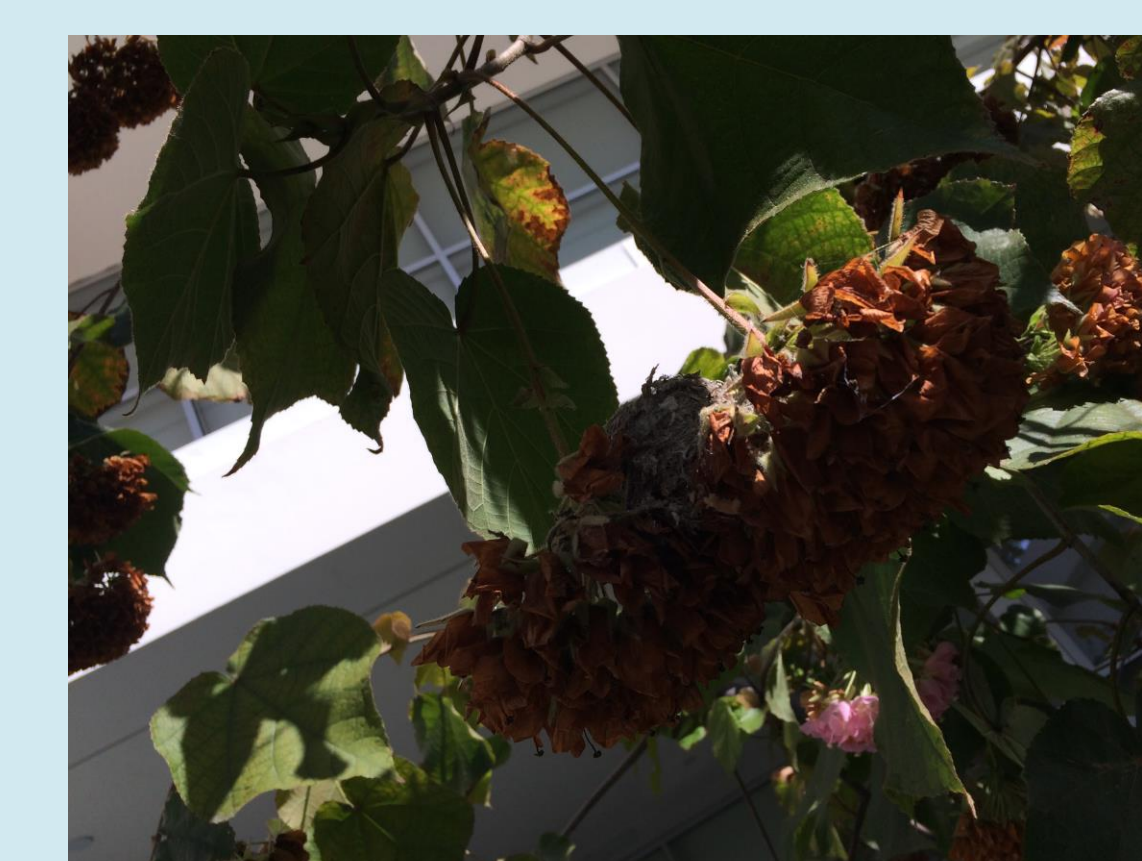
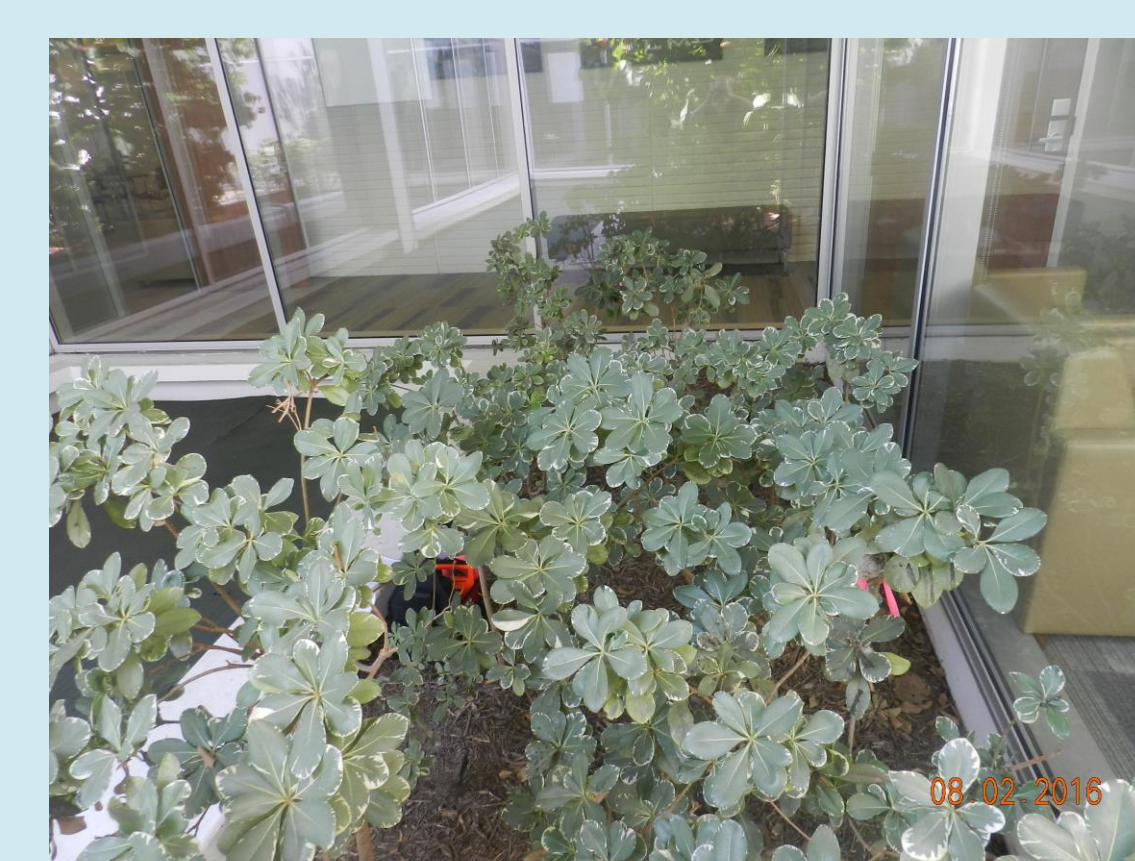
2016: Figure 3. Cluster of 3 nests



2016 (Left) 2017 (Right Two) Figure 5. New Nest Found by Prior Cluster by Study Abroad



2016 (Left) 2017 (Right Two) Figure 6. New Nest within 2ft of Old Nest Location



2016 (Left) 2017 (Right) Figure 7. New Nest Found by Old Clusters at V.D.A (Inside section)

## Results

- 14 new nests were made by Allen's hummingbirds (*Selasphorus sasin sedentarius*).
- 1 new nest was created by a Anna's hummingbird (*Calypte anna*).
- Nest 11 was built less than 2 ft away from an old nest.
- Nest 1 and 16 are located within 5 ft of each other and two old nests
- Most nests are very near the locations used the prior season. These nests seem to indicate an annually clumped distribution.

## Discussion

- The 6 new nests near Van Der Ahe and 3 new nests by University Hall seems to affirm the large-scale clustering observed last season.
- Many nests within the large-scale clumps have very close neighbors, suggesting small-scale clustering exists as well.
- These data support the hypothesis of clumped distribution.
- Mapping and analyzing the distribution of hummingbird nests has already helped locate 15 nests this season.**
  - New nests improve the distribution analysis, increasing the likelihood of a new find.
  - Each new nest is a valuable find for the CUREs, as each active nests is observed for multiple studies.
- A significant number of nests are located in microhabitats that may be slightly warmer than their immediate surroundings.**
  - The walls near some nests may radiate retained heat as the surrounding temperature drops each evening.
  - The windows near some nests may leak inside heat from the building, consistently warming the space outside.
  - Temperature and humidity of all active nests sites are being collected by data loggers in case this preliminary data confirms the above observations and can base a future study.

## Literature Cited

- Christopher J. Clark (2017) eBird records show substantial growth of the Allen's Hummingbird (*Selasphorus sasin sedentarius*) population in urban Southern California. The Condor: February 2017, Vol. 119, No. 1, pp. 122-130.

## Acknowledgements

- A special thanks to CUREs, E. Eberts, Dr. P. Auger for helping an Electrical Engineer figure out what the heck biology research is.