# Hummingbird Responses to Predator Decoys

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## Abstract

Hummingbirds act as important plant pollinators. In an urban environment, artificial feeders have become an important food resource.[1] Without artificial feeders, hummingbirds would be forced to move around to different flower locations to find nectar and thus be less predictable to a predator. However, as feeders provide consistent food, hummingbirds often habitually return to the same feeder. This provides a unique opportunity to predators. If hummingbirds are not able to properly identify or respond to threats near a feeder, they are likely more susceptible to predation. This may significantly affect hummingbird demographics in urban areas and/or apply selective pressure towards behaviors that minimize predation. In this study, various predators and threats are presented at established feeder sites using both artificial predator decoys and vocalizations, then analyzed and interpreted. This investigation aims to develop a better understanding of the broader impacts of artificial hummingbird feeders within the urban environment.

## Question

How do hummingbirds react differently to various threats when feeding at artificial hummingbird feeders located in a highly developed urban area?

## Hypotheses

**H1A**: Hummingbird activity will decrease with the presence of any predator decoy and vocalization playback
**H1B**: Hummingbird activity will initially decrease with the presence of a predator and vocalization playback, but habituation will cause activity to return to a normal baseline
**H2C**: Hummingbird activity will decrease with exposure to either the hawk or cat decoy and vocalization playback, but will increase with exposure to a hummingbird decoy and vocalization playback

## Methods

**Decoy and Vocalization Presentation**
- One of three decoys were placed in close proximity to the feeder.
- Placement location of each type of decoy varied to ensure that each would mimic natural movement expectations
- A predator call unit was programmed to play vocalizations of the respective decoy.

**Locations**
- Three active feeder locations on the LMU campus were used. Locations included sites in a garden and directly adjacent to buildings on the LMU campus
- Feeder locations were established and maintained for at least one week prior to experimentation to attract hummingbirds

## Decoys

**Male Anna's hummingbird decoy**
Attached directly to feeder

Male Allen's attacks decoy

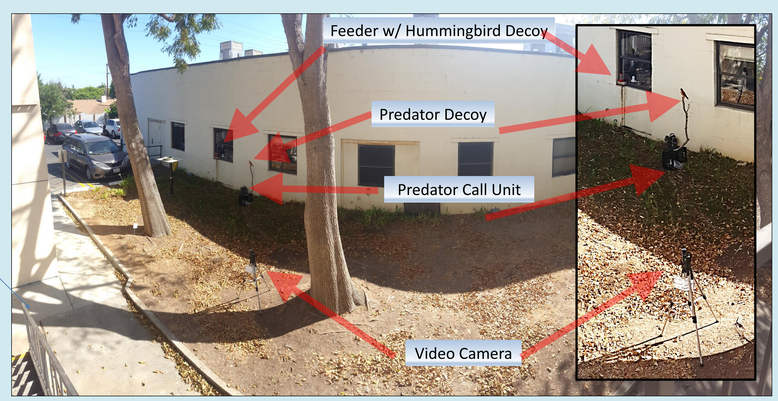
Male Allen's attacks decoy

Male Allen's inspects decoy

**Female Kestrel decoy**
Mounted on tree branch near feeder

**Male Anna's Hummingbird**
Attached directly to feeder

**House cat decoy**
On ground near feeder




**Experimental Setup**

## Methods

**Time Period**
- Trials began on August 29, 2016 and ran through December 9, 2016.
- Baseline trials were run before each experimental trial with no decoy or vocalizations to establish feeder baseline activity.
- Each trial lasted one hour, after which the decoy and equipment were removed.

**Data Collection**
- One camera monitored the feeder, decoy, predator call unit, and any activity within the camera frame.
- Direct observations were made on some trials to ensure the accuracy of counts from videos.

**Hummingbird Feeder Content**
- A 20% aqueous solution of standard cane sugar was used to fill the feeders. To make the solution, sugar is added to warm water and stirred and then analyzed using a refractometer.

## Preliminary Findings

- No noticeable changes in feeder activity were observed when using the Kestrel or the Cat decoys.
- No mobbing or other forms of aggression from hummingbirds have been observed towards the Kestrel or the Cat decoys.
- **Male hummingbirds have been observed aggressively attacking the male Anna's hummingbird decoy on multiple occasions.** In some instances, the hummingbird attacked the decoy, stopped to feed, then continued its attack. It is unclear if the presence of this decoy has changed feeding activity.

## Potential Implications

- If hummingbirds are not able to properly identify or respond to predation threats near a feeder, they may be more susceptible to predation.
- This could have an impact on hummingbird predation in urban areas and/or produce important selective pressure towards behaviors that minimize predation in urban locations.

## Literature Cited

- Rachel E. McCaffrey and Susan M. Wethington (2008) How the Presence of Feeders Affects the Use of Local Floral Resources by Hummingbirds: A Case Study from Southern Arizona. The Condor: November 2008, Vol. 110, No. 4, pp. 786-791.

## Acknowledgements

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