



Nest Predation Rates Using Artificial Eggs and the Efficacy of Quail Eggs Versus Artificial Eggs



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Abstract:

Nest predation is the leading cause of reproductive failure in birds, accounting for about 70% of net loss (Ricklefs 1969)

This project aims to observe which predators interact with artificial nests and see if their location at various heights will impact predation rates

Nests will be positioned at three locations (ground, shrub-level, and canopy-level) and will include a variety of eggs (quail, clay, combination of both)

Introduction:

There will be three active nesting sites: The Pine Barrens in Medford, NJ; Bottoms Lake in Clementon, NJ; and Delaware Valley University's campus in Doylestown, PA. The Pine Barrens site will take place on the property of Woodford Cedar Run Wildlife Refuge.

All sites will consists of 12 nests (4 ground level/ 4 shrub level/ 4 canopy level).

Ground nests will range 1.0 m or less; shrub level will range from 1.3 m to 1.5 m; and canopy level will range from 1.8 m to 3.0 m.

All ground nest will contain only quail eggs to ensure certain mesopredators will not develop an abdominal blockage.

References:

- Gill, Ryan A., W. A. Cox, and Thompson, Frank R., I.,II. 2016. "Timing Of Songbird Nest Predation as Revealed by Video Surveillance: A Journal of Ornithology." *The Wilson Journal of Ornithology* 128 (1) (03): 200-203
- Minelli A., 2008. "Predation." *Encyclopedia of Ecology*. 2923-2929
- Ricklefs RE (1969) "An Analysis Of Nesting Mortality In Birds." *Contribution Zoological* 9:1-4

Methods:

This project will span five months, March through June 2022. March and April have been used to perfect the nest mounting techniques, to gather materials, and create the artificial clay eggs. Clay eggs have been shaped and precisely weighed to the amount of 16 g (a quail egg weighs 13.5 g).

Currently nests, eggs, and gear is airing out to remove human scents and manufacturing odor. Nests will be set up April 27-30; and data collection will be start May 1st and conclude June 18th. Nests will be monitored once a week to ensure maximum predation.

Results:

No data has been collected.

Data collection will start May 1st and conclude June 18th.

Suspected predators may include: Virginia Opossum (*Didelphis virginiana*), raccoons (*Procyon lotor*), Black Rat Snakes (*Pantherophis obsoletus*), and other mesopredators (Gill 2016, Weatherhead 2004). At each weekly visit, the following data will be collected:

- Photos from Cameras
- Nest and Egg Samples
- Significant weather observations
- Temperature (°C) at visit
- Impacted Clay Eggs
- Quantity of eggs left in nest



Test Nest at Bottoms Lake in Clementon, NJ experiencing Eastern Grey Squirrel Predation



Test Nest at Bottoms Lake in Clementon, NJ experiencing passerine visitors

| Site: | DVU Campus | Pine Barrens | Bottoms Lake |
|------------------------------|------------|--------------|--------------|
| Ground Level (1.0 m or less) | 4 | 4 | 4 |
| Shrub Level (1.3 m to 1.5 m) | 4 | 4 | 4 |
| Canopy (1.8 m to 3.0 m) | 4 | 4 | 4 |



Discussion:

"Predation is the ecological process by which energy is transferred from living animal to living animal based on the behavior of a predator that captures and kills a prey before eating it (Encyclopedia of Ecology, 2008).

The use of video to monitor nests has increased in frequency over the past 25 years and has proven highly successful (Gill et al. 2016)

The primary purpose of three different sites is to emulate different population densities. Clementon, NJ will be considered an urban testing environment; the Pine Barrens will be the rural testing environment, and Delaware Valley University's Campus will be suburban.

Conclusion:

At the conclusion of the experiment, we hope to have observed predation rates and predator species across South Jersey ranging to Doylestown, Pa.

Knowing what predators are actively interacting with song bird nests can lead to observations and new conservation strategies for subjected passerines.

Our initial hypothesis is that more than 50% of shrub-level nests will experience predation, and at least 60% of all nests will show signs of predation. A study from the University of Missouri yielded great success, where 151 predation events were recorded (Gill 2016).

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