Nesting Behavior of the Azure-Winged Magpie

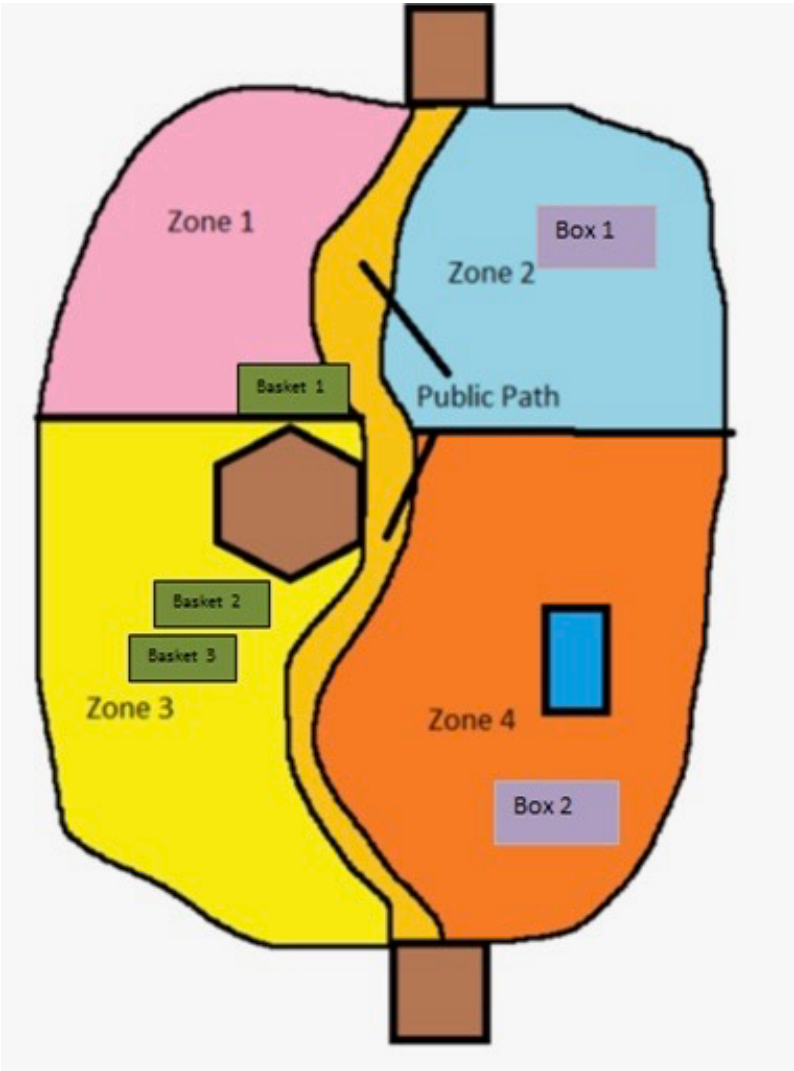
Ashley Cave

Background

- Azure-Winged Magpies (*Cyanopica cyana*) are a species of bird found in Western Europe and Eastern Asia
- Related to other magpies and crows
- Lay up to nine eggs in a clutch
- Have a 15-21 day incubation time
- Live in large familial groups
- Male and female have a role in parenting
- Prefer nesting in trees
- Exhibit cooperative parenting, where more flock members help

Goal

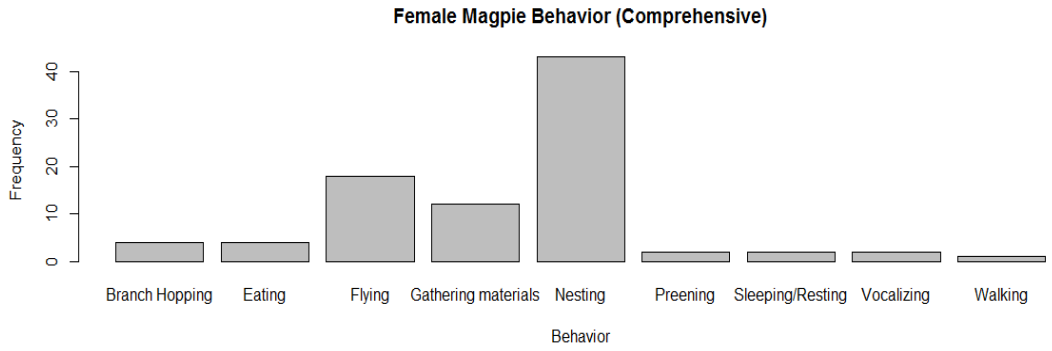
- The goal of this study was to observe nesting behaviors in a mated pair of azure-winged magpies at the Columbus Zoo and Aquarium
  - Interest in nest-site selection
  - Interest in the specific roles of each parent
  - Interest in behavioral changes based on the stage of nesting
- Research has shown differential roles, but this study focuses on how those roles change depending on the stage of nesting
- Research has also shown where magpies nest, but this study focuses on the nest selection process
- Research has been done on flocks of magpies, but this study focuses on a single captive mated pair

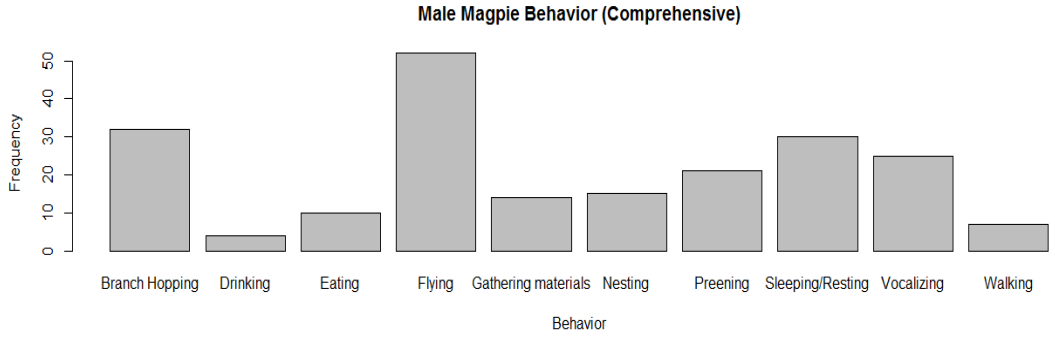


Methods

- Observe a pair of magpies in exhibit with several other birds and animals
- Record each bird's specific behavior
  - Used one-minute screening: watched each bird for a specific interval and recorded their behavior ever sixty seconds
  - Interaction between the birds was also recorded
  - Used Chi-Squared test to compare behaviors across nesting stages
- Record the location they create nests in. A zone-map of the exhibit is shown

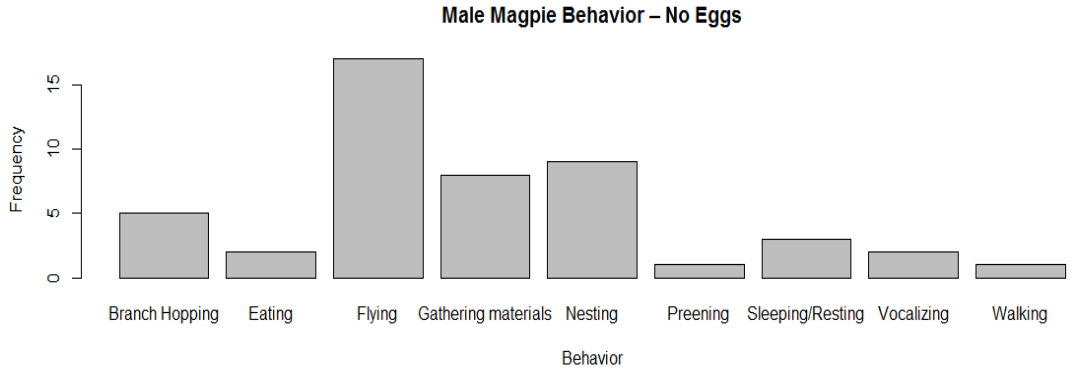
Comparative Comprehensive Time Budgets – Male vs Female

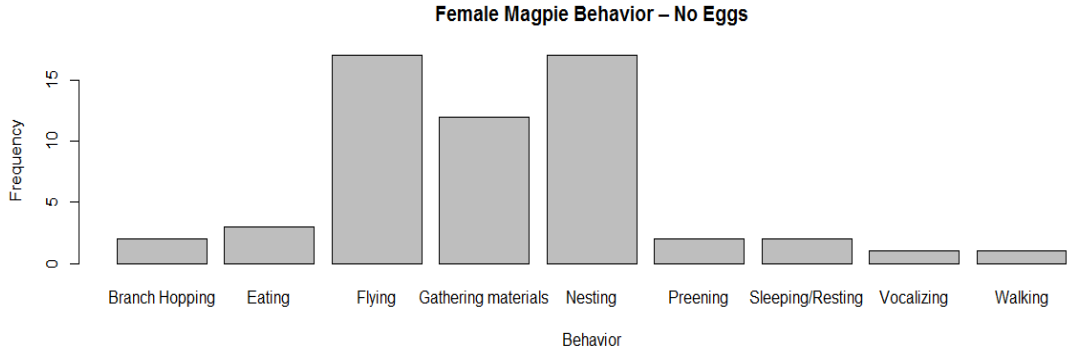




- Female spent most of her time flying, gathering materials, and nesting
- Male's behavior more evenly distributed
- Male spent most of his time flying

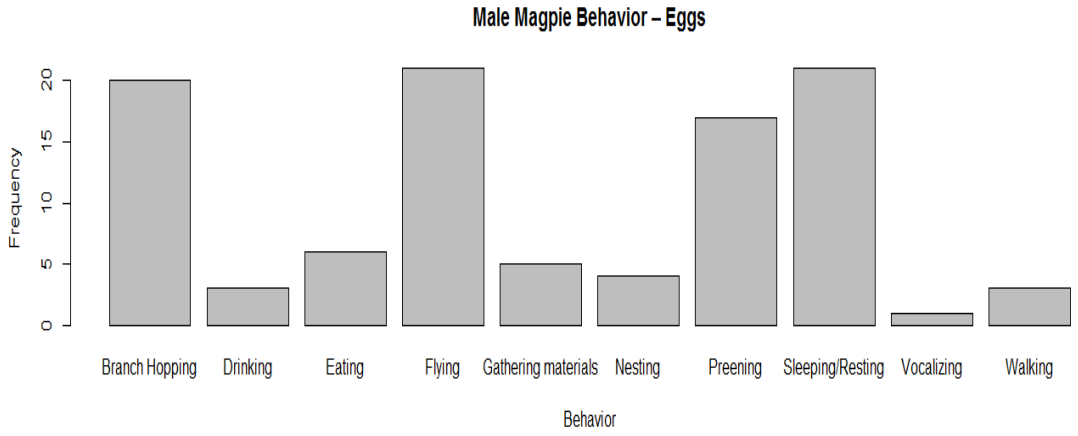
Comparative Behavior Prior to Eggs in the Nest

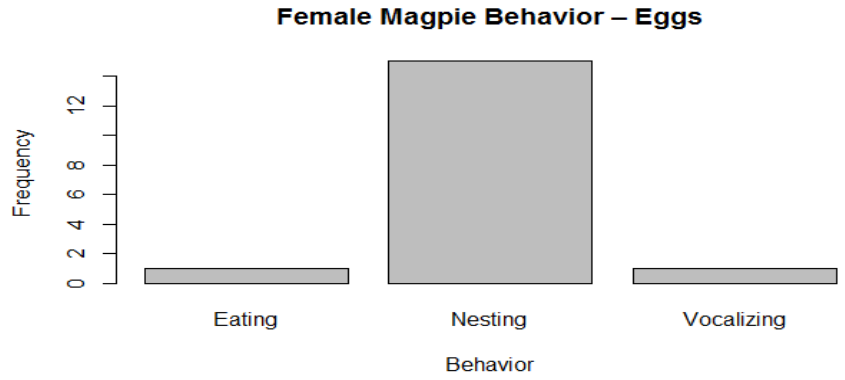




- Both spent most of their time flying, nesting, and gathering materials
- Female spent more time flying and gathering materials than the male

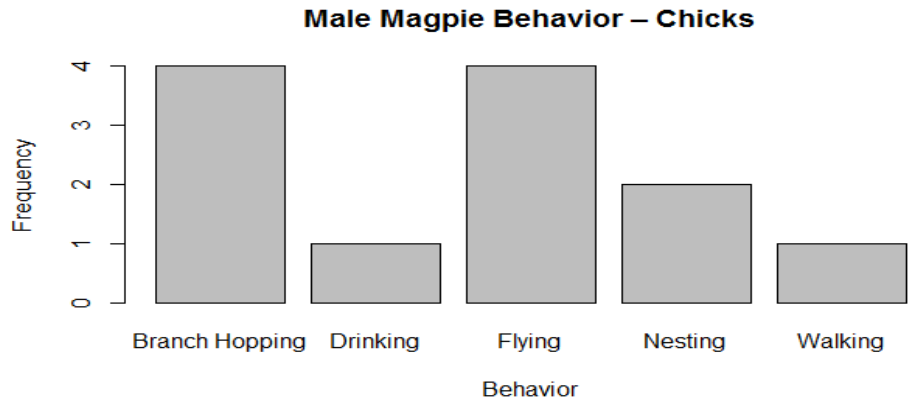
Comparative Behavior with Eggs in the Nest

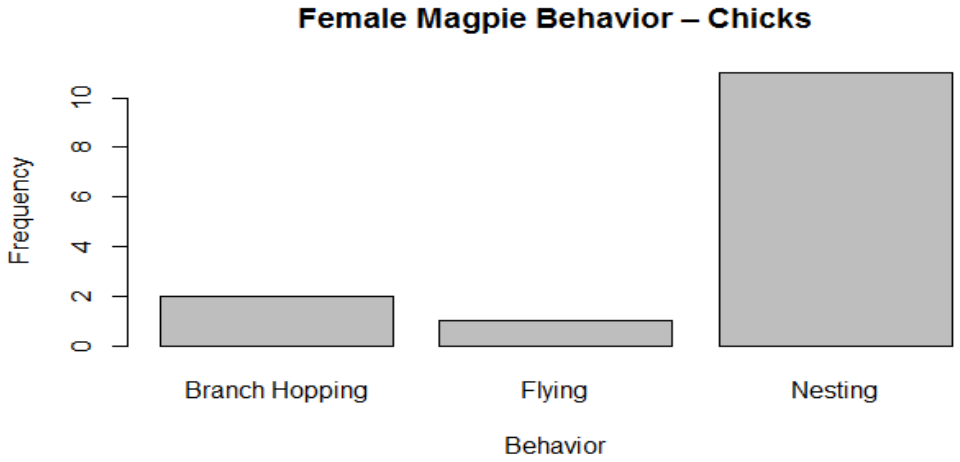




- Male still has more diverse activities
- Female only eating, vocalizing, and nesting
- Female spends most of her time nesting

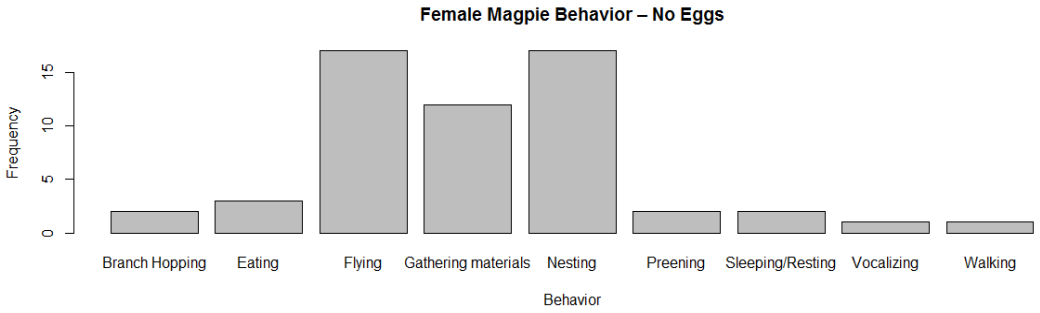
Comparative Behavior with Chicks in the Nest

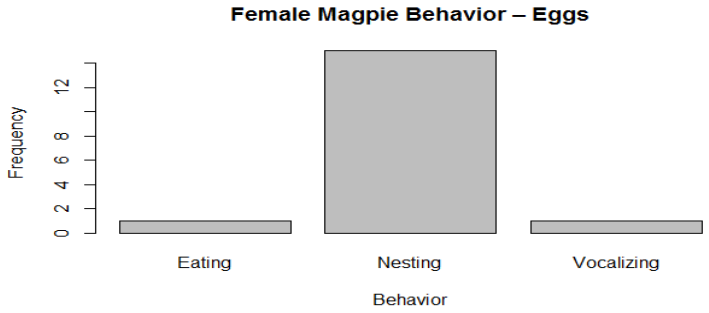


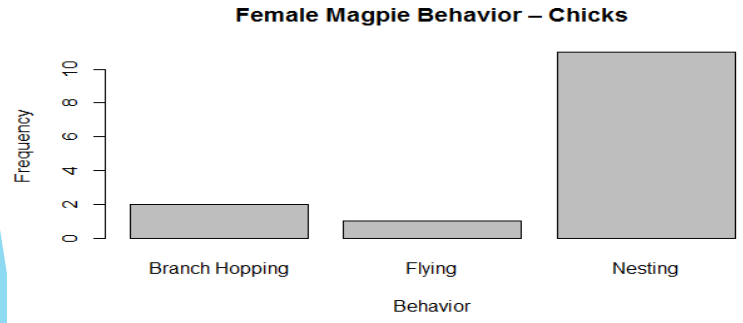


- Male is only performing five behaviors
- Male spending most time flying and branch hopping
- Female still spending most of her time nesting

Female Behavior by Nesting Stage

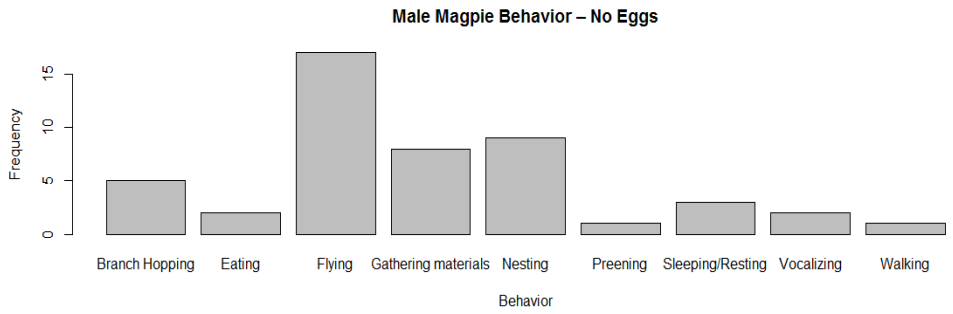


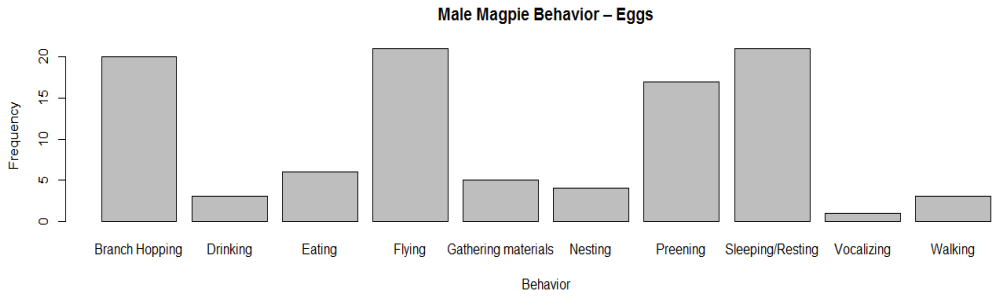


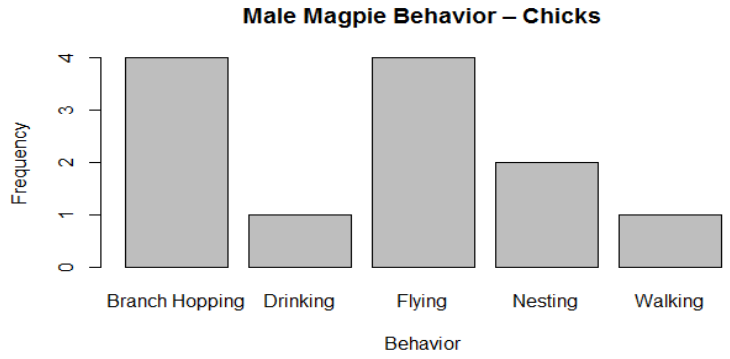


- Most diversified time budget with no eggs in the nest
- Spent most time nesting regardless of egg stage
- Less diversified time budget with eggs and chicks
- During egg and chick stages, she spent a large majority of her time nesting
- $X^2 = 34.49$, $p = 0.004664$

Male Behavior by Nesting Stage

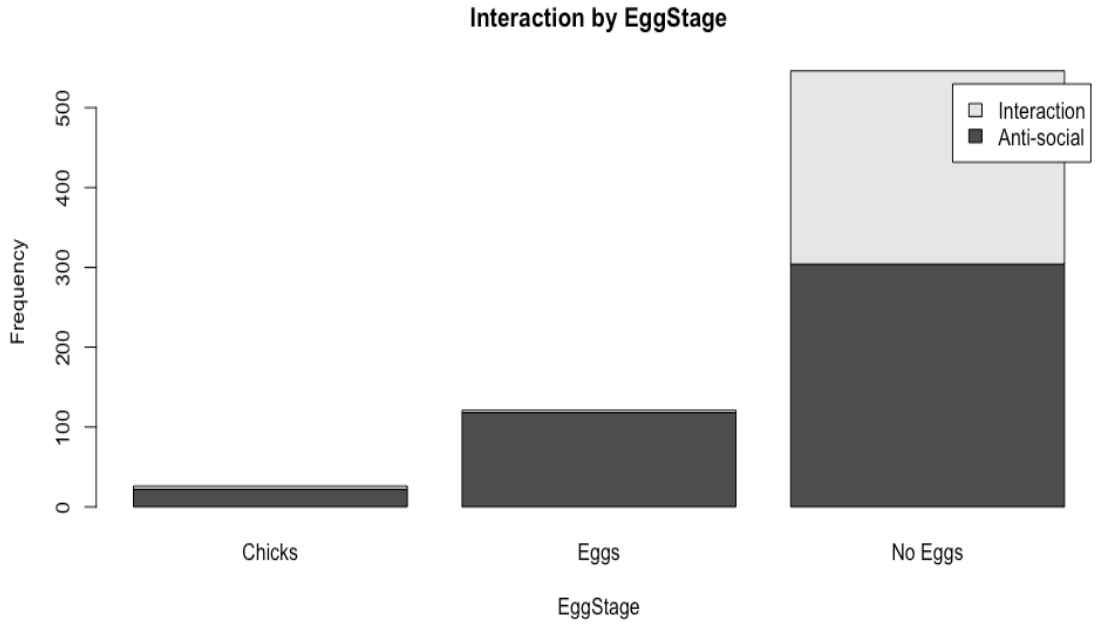






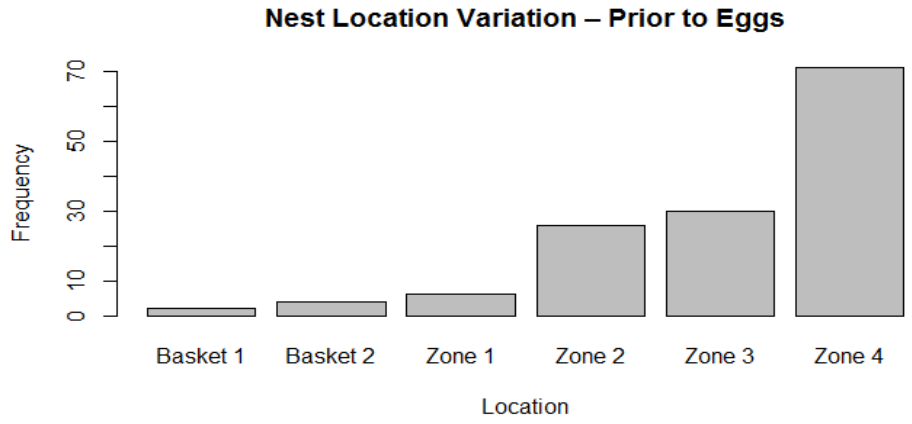
- Diversified time budget with no eggs in the nest
- Spent more time on four behaviors with eggs in the nest
- Less diversified time budget with chicks in the nest
- Spent most time nesting with chicks and without eggs in the nest
- Spent most time gathering materials prior to eggs
- $X^2 = 122.24$, $p = 4.438e\text{-}14$

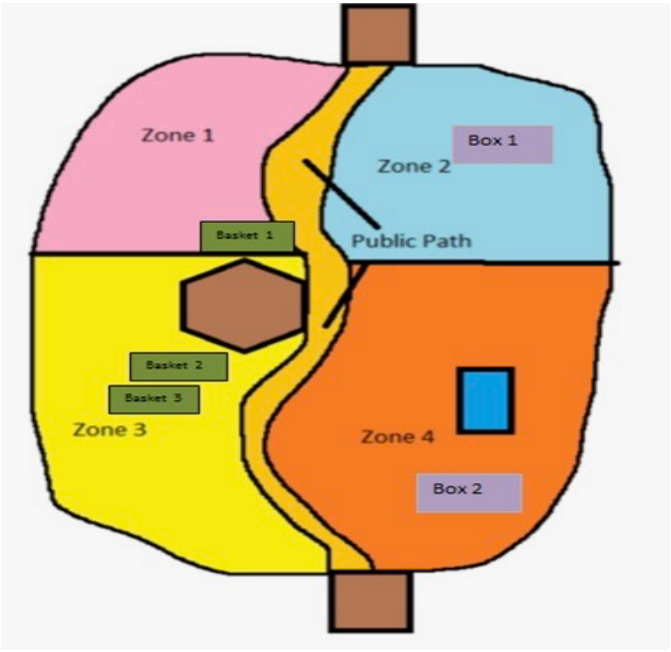
Interaction for Each Stage of Nesting



- Interaction is being within two feet of each other
- Usually Anti-social
- Most interaction without eggs in the nest
- $X^2 = 80.286$, $p < 2.2e\text{-}16$

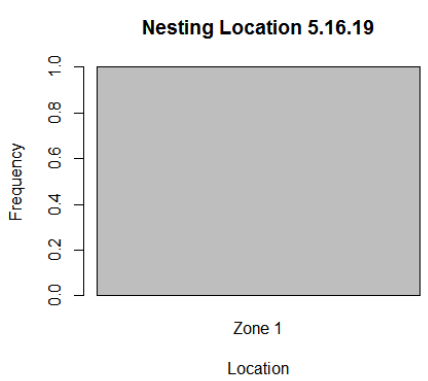
The Many Nests of the Azure-Winged Magpie

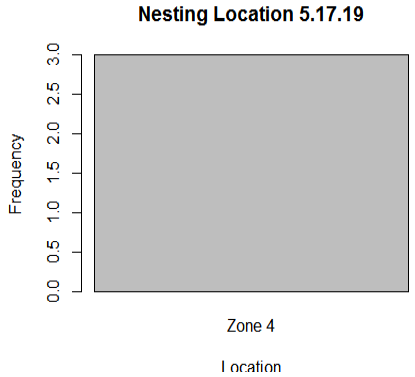


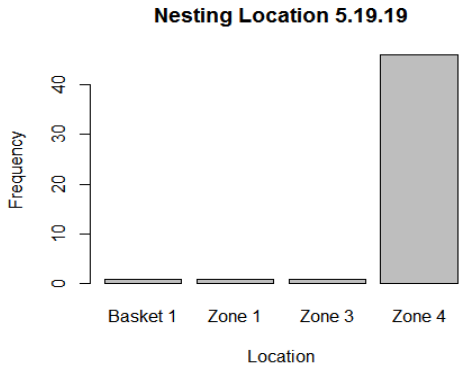


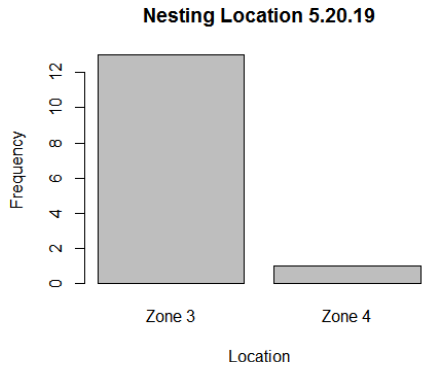
- Ended up in Zone 3 Nest
- Each zone had a tree they would nest in
- Changed nesting location every few days
- Hardly used baskets
- Did not use nest boxes
- Prefer trees, as seen in other studies
- $X^2 = 376.98$, $p < 2.2e\text{-}16$

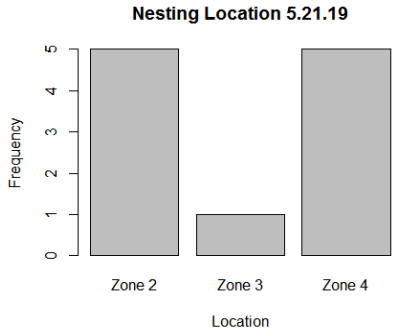
Nesting Location by Day

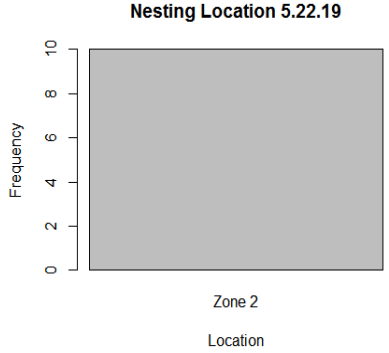


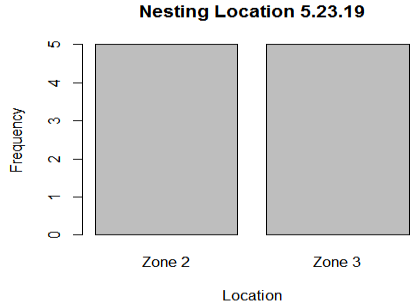


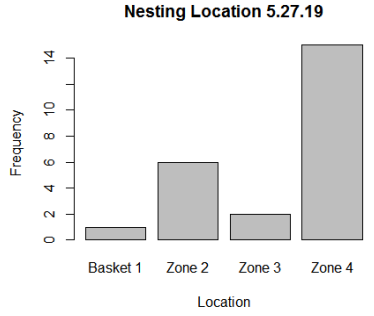


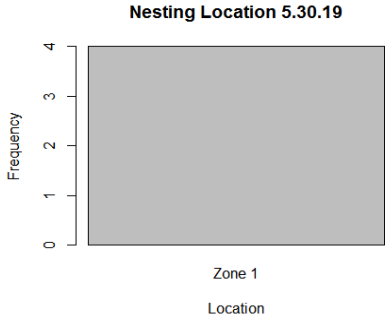


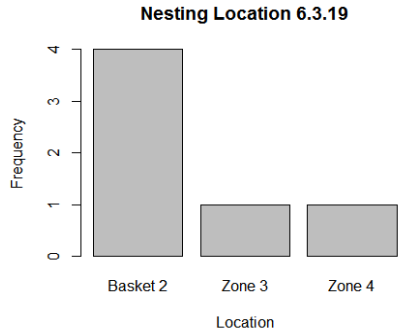


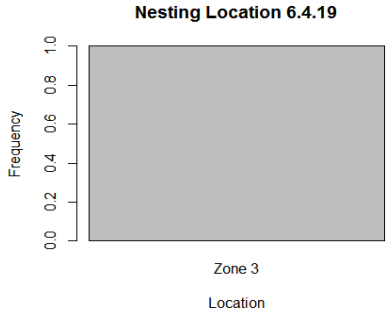


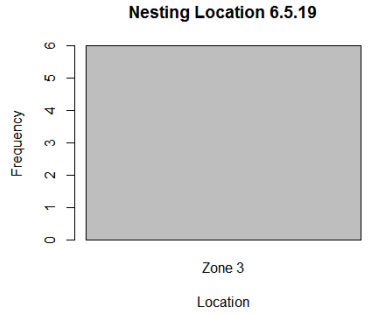












Conclusions

- Male and female magpies have distinct roles in parenting that vary by the stage of nesting
- Parents interact the most before the eggs are laid
- Magpies create several nests before choosing one to lay their eggs in
  - The one they spend the most time on won't necessarily be the one they choose
- Magpies prefer trees over artificial baskets and nest boxes

Further Reading

- Bagley-Vyas, K. (n.d.). Species Fact Sheets: Azure-Winged Magpie. Retrieved April 24, 2020, from http://aviansag.org/Fact_Sheets/PACCT/Azure-winged_magpie.pdf
- Buitron, D. (1988). Female and Male Specialization in Parental Care and Its Consequences in Black-Billed Magpies. *The Condor,90*(1), 29-39. doi:10.2307/1368429
- Nakahara, T., Kuroe Misako, Hasegawa Osamu, Hayashi Yuko, Mori Sayaka, & Eguchi Kazuhiro. (2015). Nest Site Characteristics of the Newly Established Eurasian Magpie Pica pica Population in Hokkaido, Japan. *Ornithological Science*, *14*(2), 99–109.
- Peter O. Dunn, & Susan J. Hannon. (1989). Evidence for Obligate Male Parental Care in Black-Billed Magpies. *The Auk*, *106*(4), 635.
- Shigemoto Komeda, Satoshi Yamagishi, & Masahiro Fujioka. (1987). Cooperative Breeding in Azure-Winged Magpies, Cyanopica cyana, Living in a Region of Heavy Snowfall. *The Condor*, *89*(4), 835.