Urban Raptors Presentation

Department of Geographical and Sustainability Sciences

The University of Iowa
IOWA INITIATIVE
FOR SUSTAINABLE COMMUNITIES

Class Led by Dr. Heather Sander

Caleb Wilson
Cody Hodson
Evan Wolfe
Diana Edmond
Orion McCullough-Smith
Russell Friedman

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Iowa Initiative for Sustainable Communities
Provost's Office of Outreach & Engagement
The University of Iowa
111 Jessup Hall
Iowa City, IA, 52241
Email: iisc@uiowa.edu
Website: http://iisc.uiowa.edu/

Urban Raptors of Iowa City

BY: CALEB WILSON, CODY HODSON, EVAN WOLFE, DIANA EDMOND, ORION MCCULLOUGH-SMITH, AND RUSSELL FRIEDMAN

Photo: Orion McCullough-Smith

Introduction – Why Raptors?

- Ecosystem health and Urbanization
  - Raptors can sometimes serve as an indicator of overall ecosystem health(1)(2)
- Avoiders – found in rural or natural areas.
  - Prairie Falcon (3)
- Adapters – Found in natural areas but increasingly found in urban areas
  - Screech Owl (3)
- Exploiters – Found almost exclusively in urban areas near urban resources
  - Peregrine Falcon (3)

- Frequencies of these types of species could change as Iowa City urbanizes and grows. (4)

http://kronbergwall.com/wp-content/uploads/2016/02/urban_rural_hi.jpg

Objectives & Hypotheses

- Raptor abundance
- Species composition, probabilities, and distribution factors
- Higher richness in medium—low development
  - Intermediate disturbance hypothesis (5)
- Generalists in core, specialists in rural/natural land (4)

*Photo: Orion McCullough-Smith

Data

- secondary data sources—land cover characteristics
- degree of canopy cover, impervious surfaces, and shrubland/grassland
- Sourced from the Johnson County High Resolution Land Cover Dataset

Photo: Orion McCullough-Smith

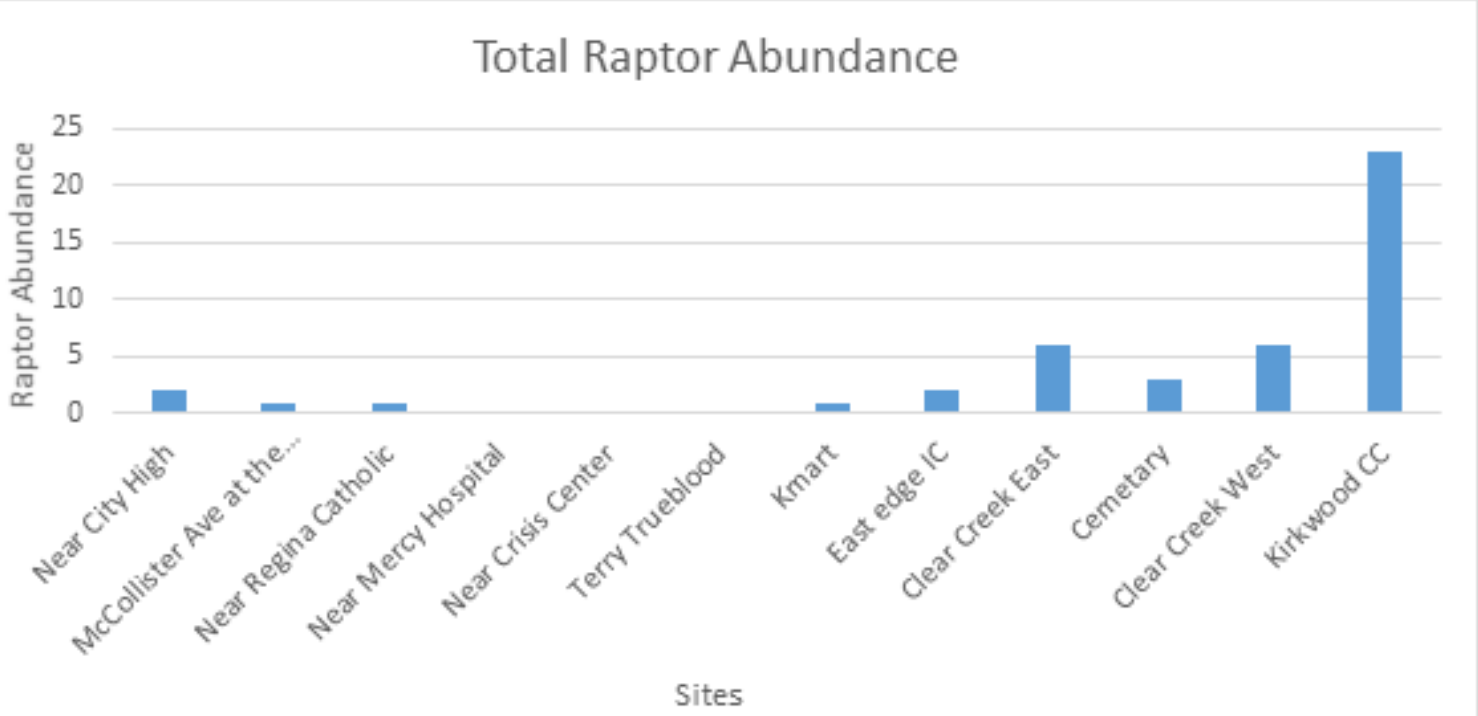
Methods

- 12 sites were surveyed following a 2400m transect
- Protocol modified from (bibby 2000)(6) and the Terrestrial Visual Encounter Survey protocol from the Multiple Species Inventory provided by the Iowa DNR (7)
- Utilized a generalized random tessellation selection (GRTS) method
  - spatially-balanced pseudo-random site selection across all land cover types
- Two observers at a pace of 800m/hr.
- Spectrum of land cover classes
- Locations recorded and identified if possible

*Photo: Orion McCullough-Smith

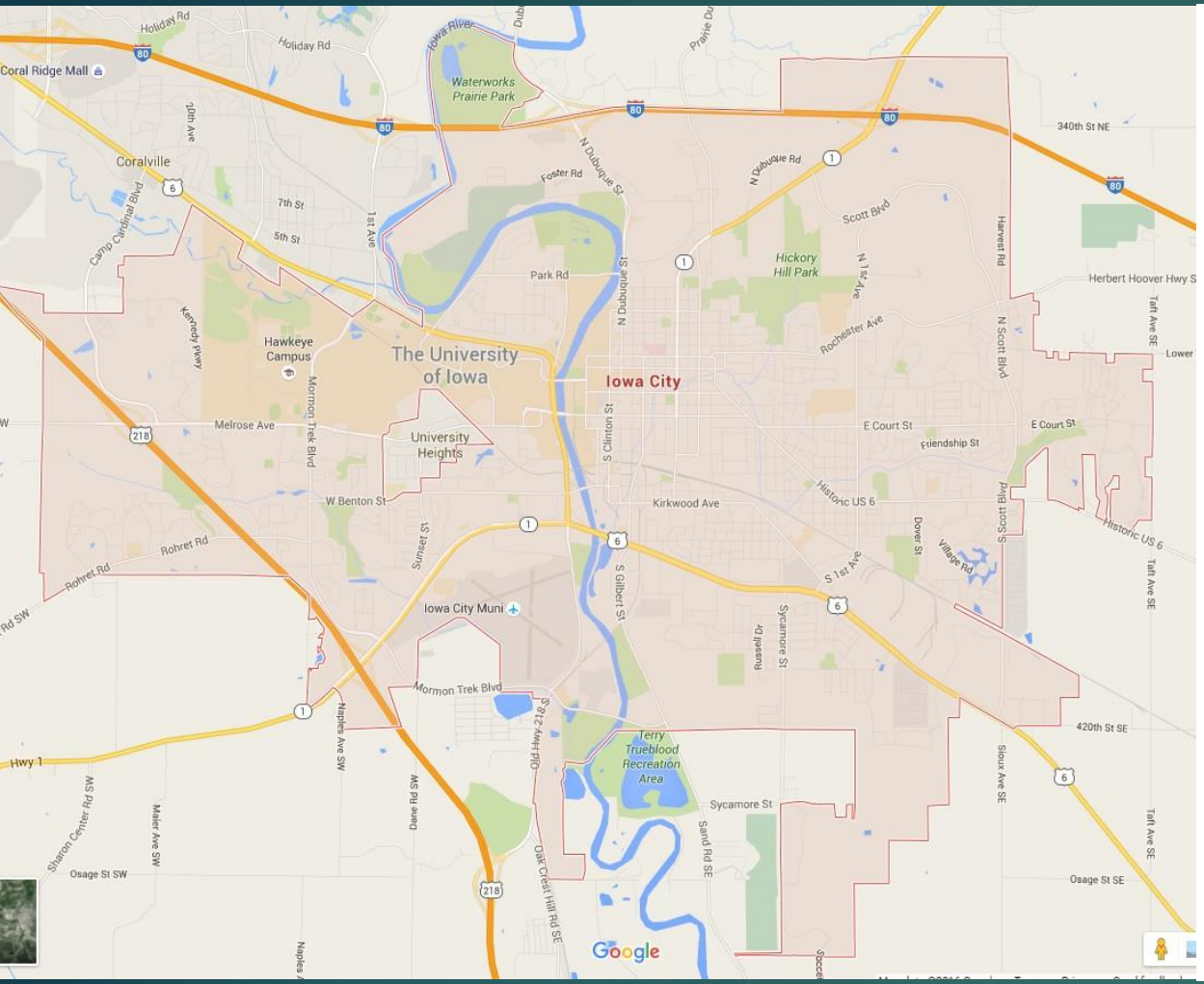
Results

- Raptor abundance
  - Highest: Kirkwood CC: 23 Raptors
  - Lowest: Near Mercy Hospital, Near Crisis Center, Terry Trueblood: 0 Raptors
- Land cover and sp. Richness
  - High frequency: 3 low urban intensity sites
  - Low Frequency: spans entire gradient

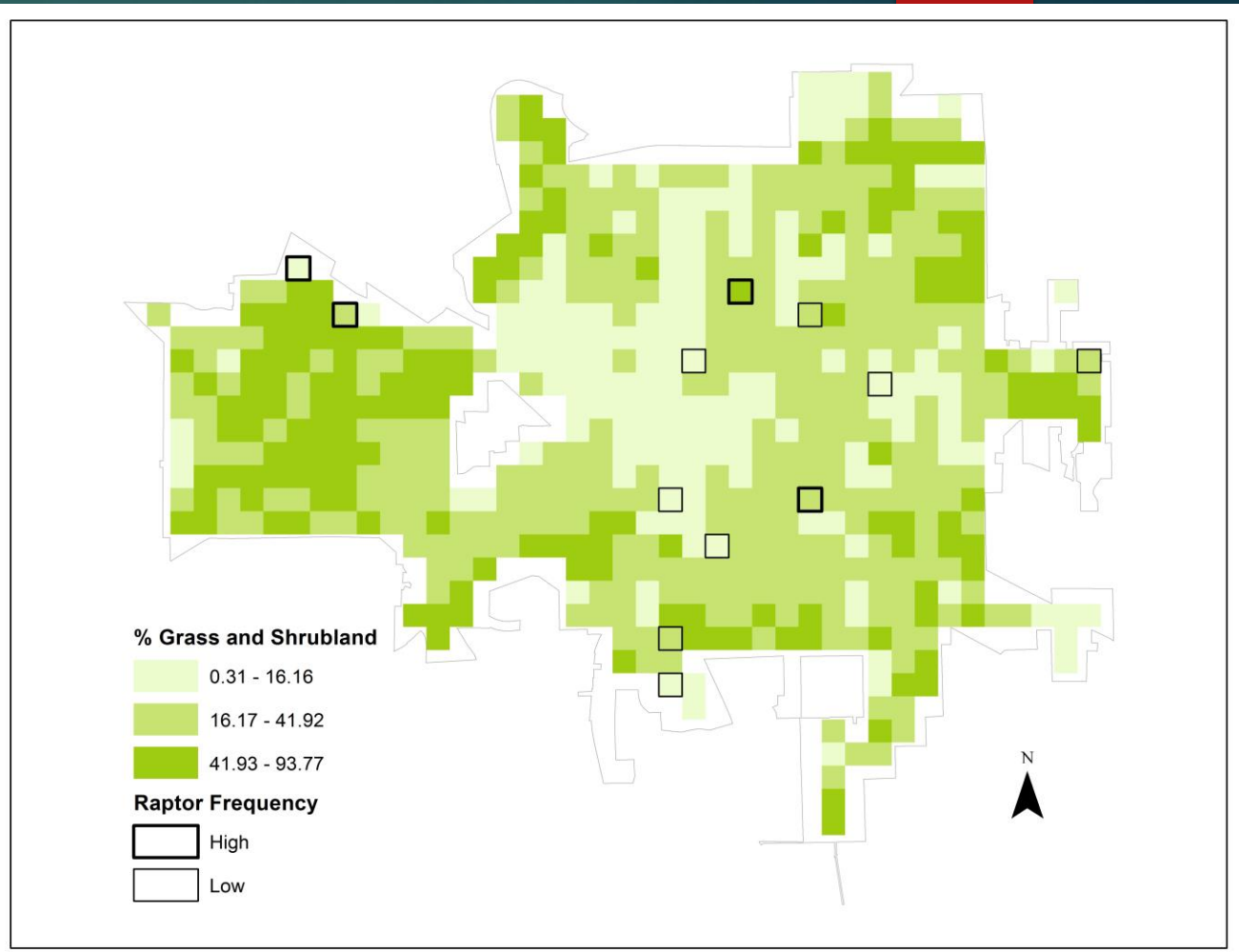


Sites	Urban intensity	RaptorFrequency
Near City High	med	low
McCollister Ave a	med	low
Near Regina Cath	med	low
Near Mercy Hospi	high	low
Near Crisis Cente	high	low
Terry Trueblood	low	low
Kmart	high	low
East edge IC	med	low
Clear Creek East	low	high
Cemetary	low	high
Clear Creek West	low	high
Kirkwood CC	high	high

Abundance Map with observed sites

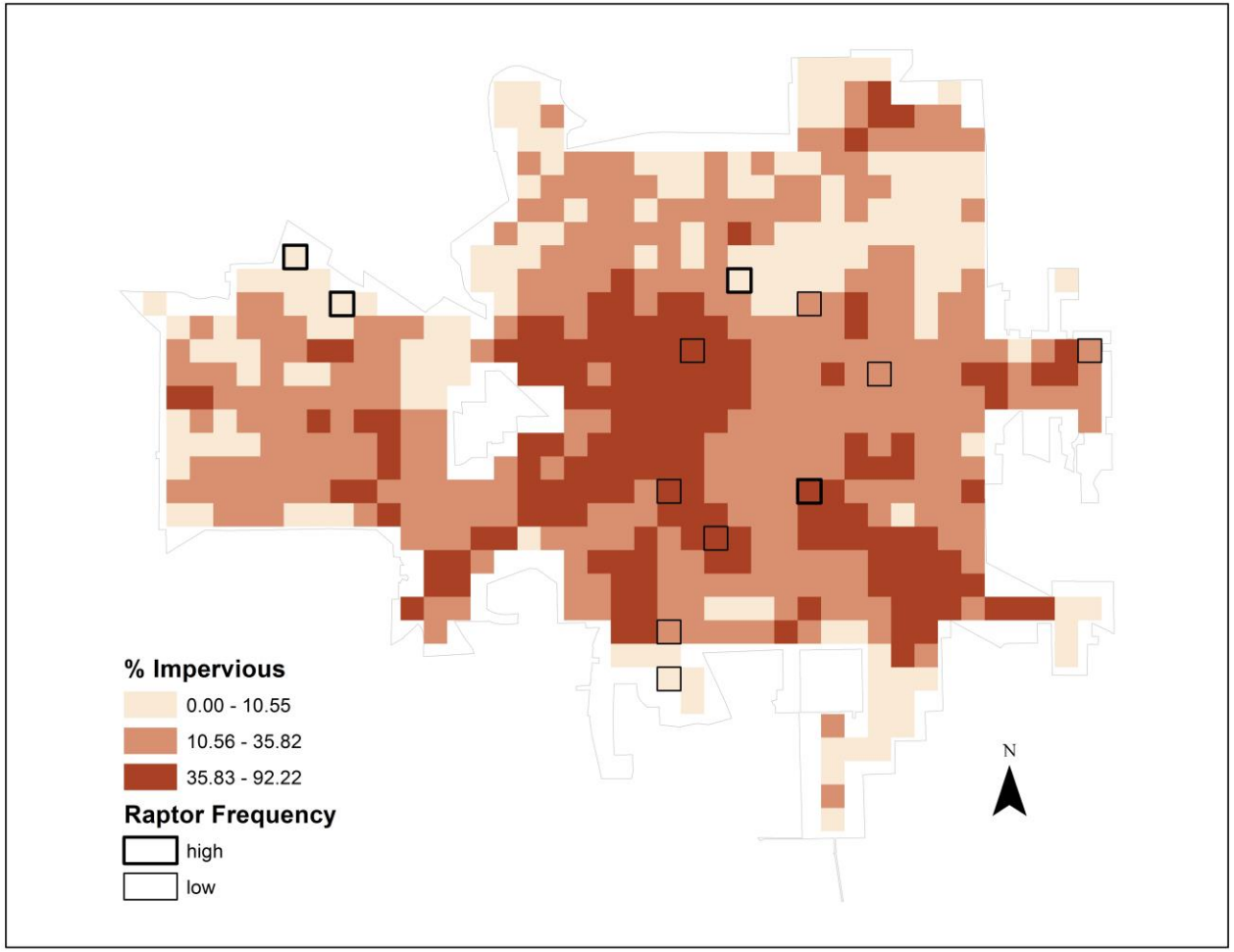


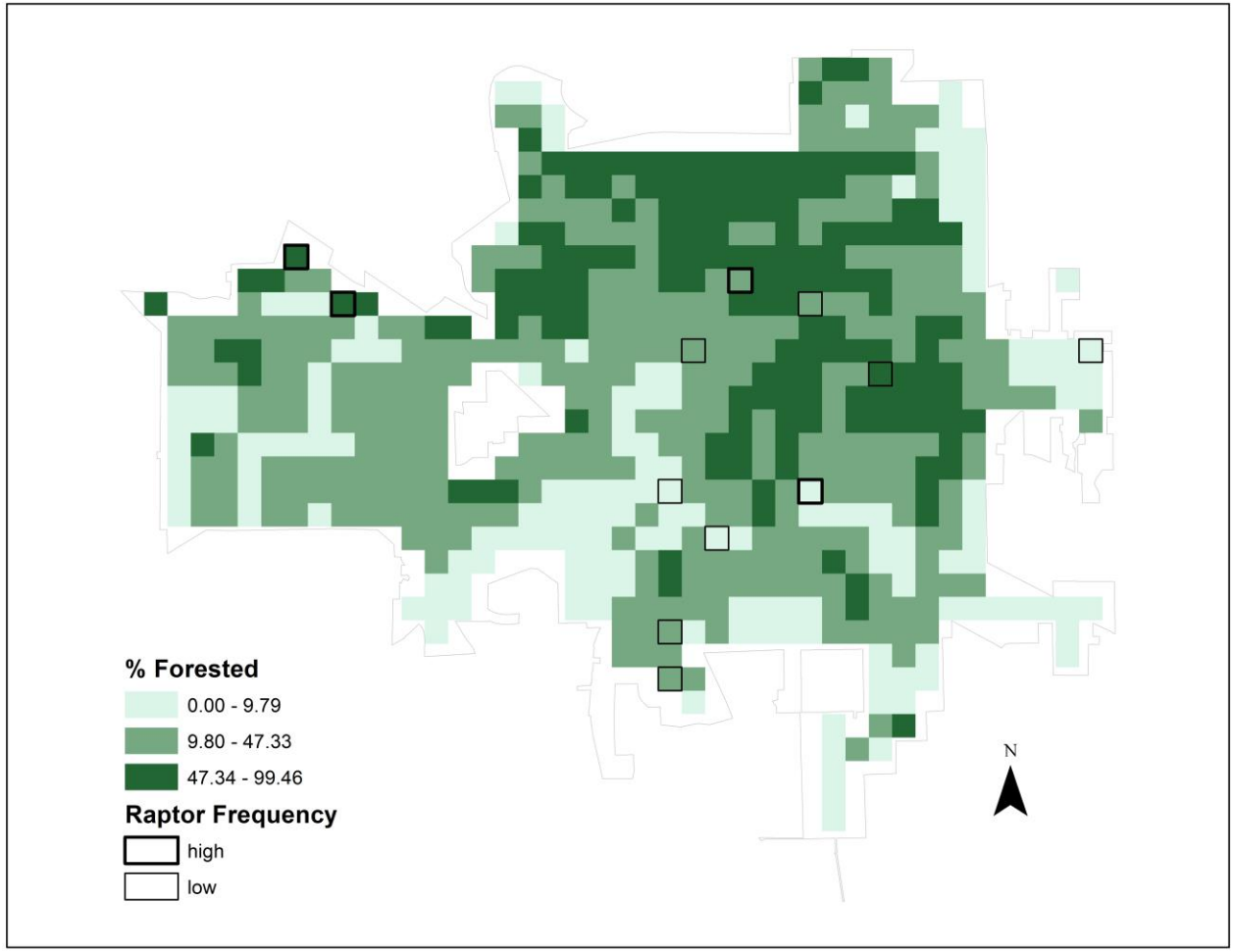
Map: https://www.google.com/maps



3 of 4 high frequency sites in areas of medium to high levels of grass and shrubland

Abundance compared to impervious surfaces and forested land

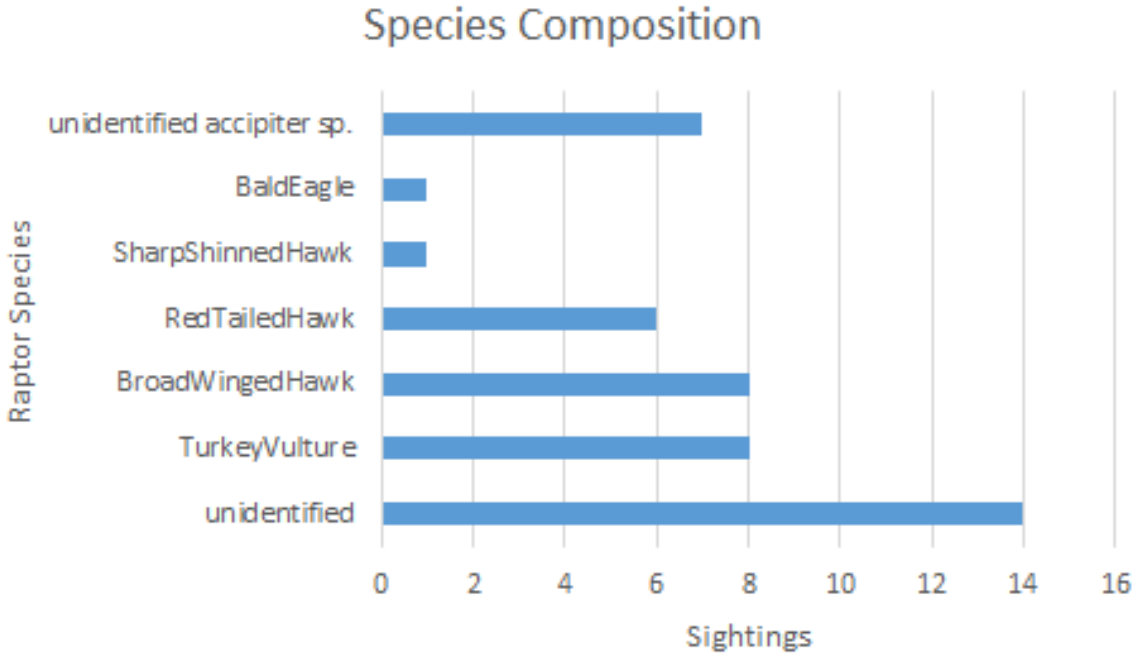


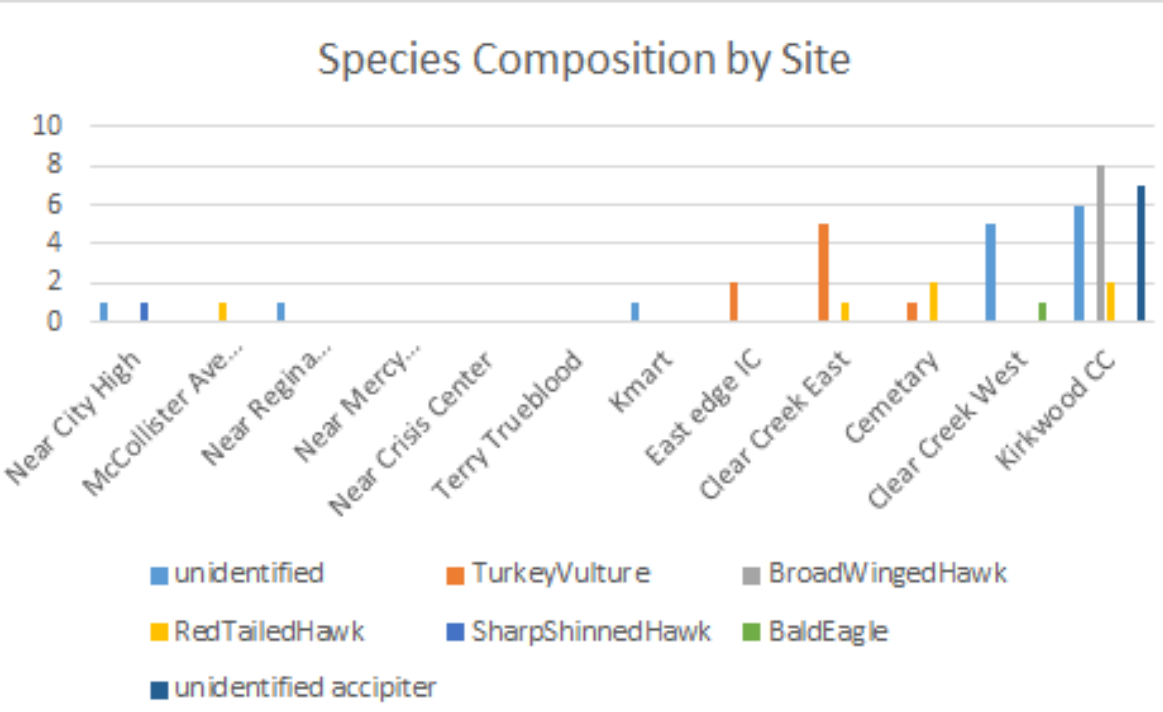


- 3 of 4 high frequency frequency sites in areas of low imperviousness
- 3 high frequency sites in areas of high forest cover

Species Composition

- Turkey Vulture and Broad Winged Hawk most abundant
- Accipiters include sharp shinned hawk and cooper hawk
- Kirkwood CC: Highest species richness
- Most commonly seen species = Urban adapters
  - Turkey vultures: prefer open spaces adjacent to wooded areas (8)
  - Broad Winged Hawk: prefer mixed forests next to open land (9)
- Least commonly seen: Sharp Shinned Hawk & Bald Eagle
  - Both are very sensitive to human impact (10)
  - SSH prefers dense forest (11)





Analysis

- Which birds occurred more often in our sample?
  - Turkey Vultures most abundant
  - Sharp-shinned Hawks and Bald Eagles least abundant

- Chi-squared analysis
  - Insufficient evidence to conclude that raptor abundance differs with different land cover types
  - Tested impervious land cover, forested land cover, and grass/shrub land cover

Discussion

- More raptors in less populated areas in our sample
  - The most sighted raptors were urban adapters
- Outlier: Kirkwood CC—Urban land use
- Lots of tree cover not necessarily correlated with more raptors
- Generalists more successful—habitat & prey preferences
- Error sources: Noise, time of day, multiple sightings

Photos: Orion McCullough-Smith

Conclusions

- Need to collect more data
- Next steps—future direction

*Photo: Orion McCullough-Smith

- Biodiversity of Iowa City: Most in quiet/open space
  - Continuing urbanization supports open land hunters
- Conservation efforts: Focus on protecting natural areas close to urban core
  - Many species prefer fringe forest close to urban core (8) (9)
  - More apex predators = More species lower in food chain (2)
- Policy & planning implementation: Educate public about urban ecosystems
- Improvements for future studies
  - Longer data collection period (over entire migratory duration), more frequent sampling
- Why we should care: ecosystem health, aesthetic value

Citations

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