

Using a Bird Feeder Network to Characterize Campus Bird Diversity Abundance



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Introduction

Birds are exceptionally qualified for use as indicators of habitat quality. Birds can freely fly off in search of better environments if the one they find themselves in is not suitable. It is because of this that they are one of the best ways to study the impact of urbanization on ecological systems. It is possible that human expansion need not harm the environment, but only if the aspects detrimental to wildlife can be identified and remedied.

Species non-native to an area (referred to as invasive) can severely disrupt even well-established ecosystems by outcompeting and displacing native species. These invasive species dominate areas affected by urbanization, such as cities and townships, resulting in diminished species richness (Devictor *et al*, 2007). Research into the effects of invasive species in smaller suburban areas like the SUNY New Paltz campus has yet to be studied. Using a bird feeder network on the SUNY New Paltz grounds to band birds allows us to measure bird abundances and diversity at different categories of suburban areas.

Research Question

What is the impact of urbanization on native and invasive species abundance and diversity on the SUNY New Paltz Campus?

Materials and Methods

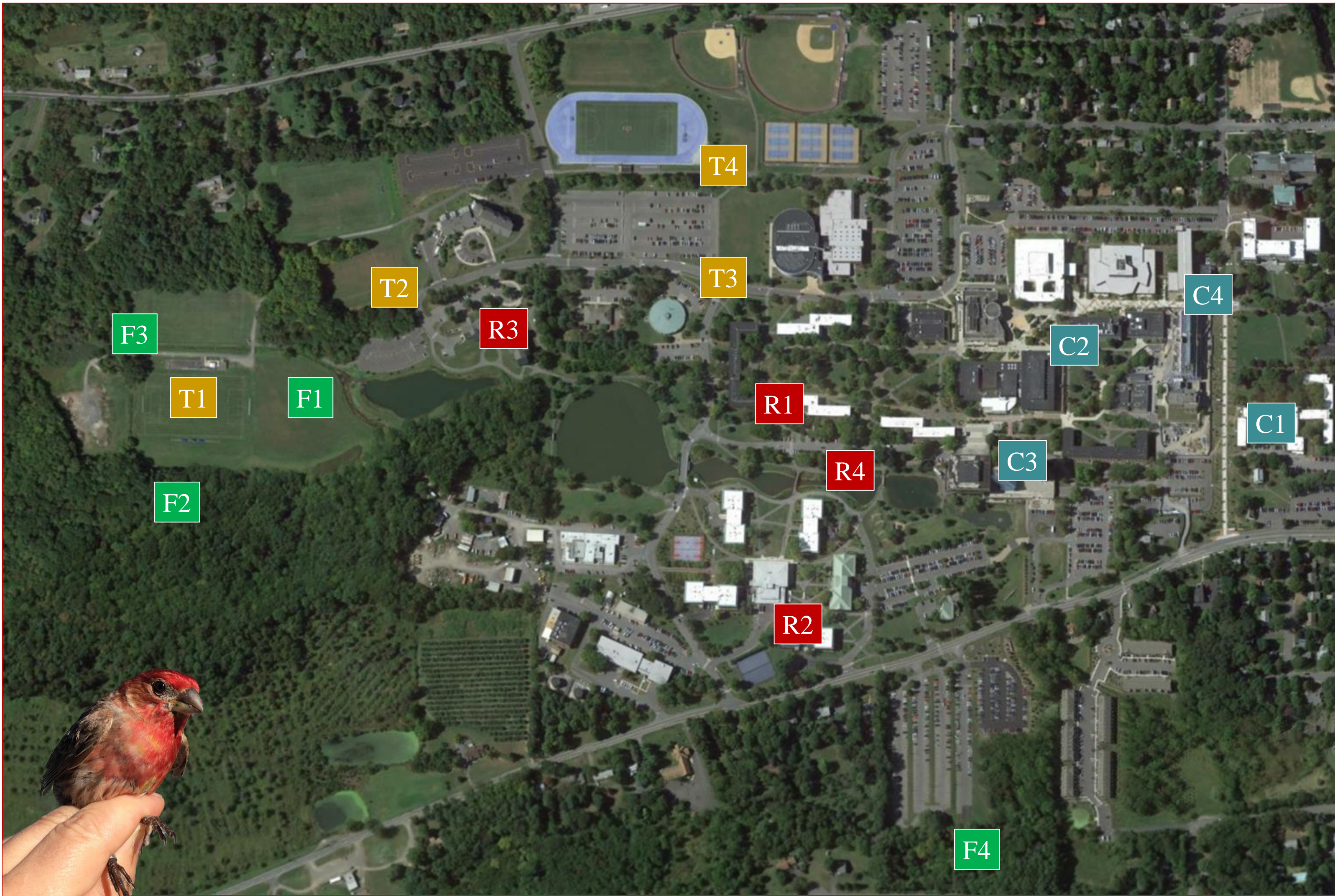


Figure 1. Campus map showing feeder locations and categories. Green Squares are Forest Edge; Gold –Turf; Red- Residential; and Blue-Central

- Four categories of feeders, Turf, Residential, Forest edge, and Central Campus
- Banding took place from May 20th to July 22nd between the of 7am and 12pm
- 12m nylon mist nets stretched between poles in a “V” formation around a feeder station.
- We set the banding station up 30 meters away from site and observed via binoculars for any birds entering the net
- Birds extracted and brought to the banding station where they were banded with colorless aluminum bands supplied by USGS (United states Geological Survey)
- Birds aged, sexed, measurements of tarsus, wing length, mass, and breeding condition taken followed by release.
- Repeated at each 16 feeder for a total of 96 hours of net time, 6 at each feeder.

Results

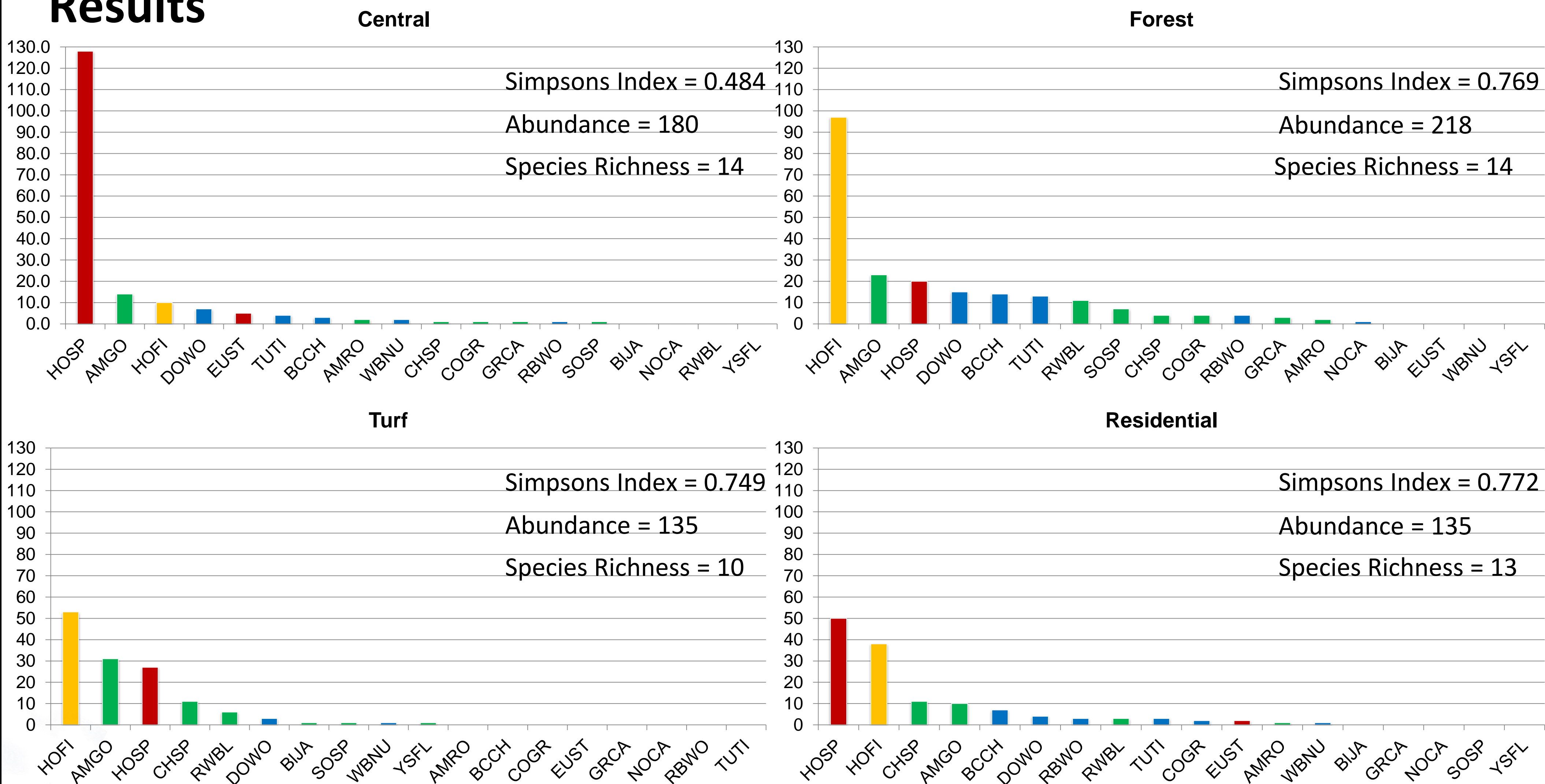


Figure 2. Banded species including species richness, diversity and abundance. Central feeders were found to significantly lower Simpson's index of diversity in a statistical test. (ANOVA: F = 4.73, p < 0.02).

Key

- Invasive species
- Naturalized species
- Native non-migratory species
- Native migratory species

AMGO- American Goldfinch
AMRO- American Robin
BCCH- Black Capped Chickadee
BIJA- Blue Jay
CHSP- Chipping Sparrow
COGR- Common Grackle
DOWO- Downy Woodpecker
EUST- European Starling
HOFI- House Finch
HOSP- House Sparrow
GRCA- Gray Catbird
NOCA- Northern Cardinal
RBWO- Red-bellied Woodpecker
RWBL- Red-winged Blackbird
SOSP- Song Sparrow
TUTI- Tufted Titmouse
WBNU- White Breasted Nuthatch
YSFL- Northern Flicker

Discussion

- The invasive house sparrow dominates in central campus, composing 71% of species banded there. Simpson's indices indicate a much lower diversity in central campus than at any of the other categories.
- Residential shows the highest diversity, however the dominant species found there is also the invasive house sparrow, indicating a mix of native and invasive as urban and wooded areas mix.
- Turf and Forest feeders were primarily occupied by house finches with turf being more even overall. This is interesting given the fact that house finches are not native to this area, but have now become naturalized.
- As predicted, Forest Edge feeders had the highest diversity of noninvasive species of all four categories. Forest Edge also leads with most noninvasive diversity having 13 species.

Acknowledgements and Citations:
Special thanks to Aidan Mabey and Laura Stark for all their assistance with the project and to the SURE program for enabling this research to be conducted.

DEVICTOR, V., JULLIARD, R., COUVET, D., LEE, A. and JIGUET, F. (2007), Functional Homogenization Effect of Urbanization on Bird Communities. Conservation Biology, 21: 741–751. doi:10.1111/j.1523-1739.2007.00671.x