

ESCI 340 BIostatistical Analysis

Project 4: Avian Scavenger Abundance

With apologies to George Orwell and Edward Snowden, the world has been under careful surveillance long before the NSA existed. Avian scavengers scan most of the planet for foods available to them. These scavengers perform important ecological functions associated with nutrient cycling, carcass disposal, and disease prevention. Without them, we would be knee-deep in roadkill, exposed to pathogenic bacteria more frequently, and suffer nauseating stench daily.

Avian scavengers form a diverse guild whose members vary among regions and habitats within regions. In the Pacific northwest, the most important avian scavengers in urban landscapes like WWU include crows (*Corvus brachyrhynchos* or *C. caurinus*), gulls (e.g., *Larus glaucescens*), and pigeons (*Columba livia*).

Although avian scavengers monitor most areas for food sources, ecological theory suggests they will be found most often and most abundantly where food sources are most abundant or most frequently available. In urban environments, such areas include locations where human foods are discarded. In this project, you will compare abundances of avian scavengers observed in areas where anthropogenic and “natural” food availability is low, intermediate, and high.

Research Question

How much greater are abundances of avian scavengers near sources of anthropogenic food scraps and open space, relative to locations distant from anthropogenic and “natural” food sources?

Hypotheses

If avian scavengers distribute themselves to maximize foraging opportunities, they will be most abundant near sites where humans purchase, eat, and discard food, because those sites provide the most consistent sources of discarded food scraps exploited by avian scavengers.

If avian scavengers distribute themselves to maximize foraging opportunities, they will be found at intermediate abundances in outdoor open space, because “natural” foods can be obtained there at frequencies and abundances intermediate between sites where humans purchase, eat, and discard food and sites converted to human uses not involving food.

If avian scavengers distribute themselves to maximize foraging opportunities, they will be least abundant near sites altered for human uses not involving food, because those sites provide neither “natural” foods nor food scraps discarded by humans.

Note that this study is observational, rather than experimental. You will collect data on avian scavenger abundances at locations that differ in many factors beyond your control. You will attribute differences in your samples to differences in some of the factors, but you will not determine whether or how those factors actually caused the observed differences. In particular, effects of food availability on avian abundances may be confounded with proximity to human activity, intensity of human activity, protected roost sites, exposure to mammalian predators, weather conditions, and time of day.

Field Methods

Find one or two partners and walk to one of the sampling locations listed below.

- 1 Immediately upon arriving at the first location, start a stopwatch.
- 2 Record the number of crows, gulls, and pigeons within 50 meters (horizontal distance) of your observation point. Keep a separate count for each species. Try to avoid counting the same individual bird more than once.
- 3 After 3 minutes, stop the stopwatch and walk to the next sampling location.
- 4 Repeat steps 1-3 until you have sampled all 16 locations listed below.

Sampling LocationsLocations near discarded food

- Haskell Plaza (outside Atrium eatery)
- Red Square, near Miller Hall eatery
- Courtyard between PAC and VU
- Vendors' Row

Outdoor open space

- Field between ES, CF, AW
- Field west of Biology
- Field south of AW
- Lawn west of OM

Locations distant from scavenger food sources

- Skybridge between HH and WL
- College Hall entrance
- Between Bond Hall and Carver Gym
- Between Engineering Technology and Fine Arts buildings