UC Agriculture & Natural Resources

Proceedings of the Vertebrate Pest Conference

Title

Population Dynamics of the Feral Pigeon in the Central Business District of Butte, Montana

Permalink

<https://escholarship.org/uc/item/4qr10315>

Journal

Proceedings of the Vertebrate Pest Conference, 27(27)

ISSN

0507-6773

Authors

Richardson, Cody
Capoccia, Stella
Hart, Julie

Publication Date

2016

DOI

10.5070/V427110524

Population Dynamics of the Feral Pigeon in the Central Business District of Butte, Montana

Cody Richardson and Stella Capoccia

Department of Biological Sciences, Montana Tech of the University of Montana, Butte, Montana

Julie Hart

Department of Occupational Safety and Health, Montana Tech of the University of Montana, Butte, Montana

ABSTRACT: The purpose of this study was to gather information on the feral pigeon population living in the central business district (CBD) of Butte, MT. Pigeons in the CBD have historically been part of the urban landscape and have contributed to local biodiversity. We report on an aspect of a larger study that was initiated to address complaints from business owners concerning damage caused by pigeons. To better understand feral pigeon population dynamics, we used live trapping, marking with leg bands, and survey transects to study the pigeons' distribution, habitat selection, and dispersal. Our results thus far indicate minimal dispersal between colonies. Two individuals have shown dispersal movements of up to 6.1 km from the tagging site. Transect surveys revealed an average of 173.3 birds present, with a maximum count of 254 and minimum of 101.

KEY WORDS: bird pests, *Columba livia*, feral pigeon, mark-recapture, Montana, population dynamics, transect surveys, trapping

Proc. 27th Vertebr. Pest Conf. (R. M. Timm and R. A. Baldwin, Eds.)
Published at Univ. of Calif., Davis. 2016. Pp. 217-220.

INTRODUCTION

Pigeons (*Columba livia*) were domesticated approximately 5,000 years ago primarily for egg production and also for communication purposes (Jerolmack 2013). Domestication selected for pigeons to become habituated to people and for the ability of year-long brood production. These characteristics have contributed to the large feral pigeon populations seen in many towns and cities. Pigeons congregate in metropolitan areas because buildings provide structure similar to the bird's natural habitats of high cliffs, rock ledges, and caves. Buildings also provide a means of protection from most natural predators, and the urban environment provides an abundance of forage. Primarily granivores, pigeons do not require complex foraging skills, but instead must forage intensively (Johnston and Janiga 1995). The abundance of forage in urban areas allows for the opportunity to expend less effort foraging; as a result, more effort can then be expended for nest building and reproduction.

Urban pigeon populations are often a concern because they cause building damage, food contamination, and potentially spread disease (Saini and Toor 1991). These problems have led to pest control measures in many areas. One such area is the central business district (CBD) of the uptown area of Butte-Silver Bow County (Butte), Montana. Formerly a booming mining town, Butte now suffers from numerous aging and vacant buildings that provide ample nest sites for pigeons. Business owners in the CBD became concerned about the pigeons in these buildings and complained to the Butte-Silver Bow County Government, which then responded to the complaints by funding a preliminary study in 2012-2013 to examine the distribution and habitat use of pigeons in the CBD. The objectives of this study were to determine the areas of highest occupancy, the availability of forage sites, and business owners' opinion regarding the pigeons.

Capoccia and Boyle (2014) found that pigeons were

concentrated in areas with vacant buildings combined with readily available foraging opportunities, such as discarded bread products and bird feeders. This study also confirmed that business owners' opinions varied between unfavorable and favorable. The majority (68%) of the 58 business owners surveyed had negative opinions about the pigeons, while 21% had neutral/no opinion about the pigeons, and only 12% had a positive opinion towards the birds (Capoccia and Boyle 2014).

We expanded on this preliminary study by focusing on pigeon populations at "hot spots" (an area with five or more pigeons at any given observation) within the CBD. Our specific objectives were to: 1) determine population abundance at colonies in these previously located hot spots and examine temporal variation in abundance, 2) determine if individuals move between hot spots, and 3) determine where individuals from each colony were foraging.

METHODS

To accomplish our objectives, we used four different techniques: 1) live trapping at select sites using baited colony traps; 2) visual markers (leg bands and flagging) to identify individuals; 3) mark-recapture methods, including point-count surveys, to estimate population size associated with individual buildings; and 4) observations along urban transects to determine foraging locations away from colonies. The data reported here were collected from mid May 2015 through the end of January 2016. Trapping, marking, and survey efforts are currently ongoing and will continue through July 2016.

Trapping and Point-Count Surveys

We captured pigeons at four previously located hot spots using 30×15×8-inch colony traps (Cabela's Inc., Sidney, NE) from mid-July through October 2015. Traps were baited with a mixture of bread and scratch grains. Poultry watering dishes were also provided inside the

Figure 1. Aerial map of the Central Business District (CBD) in the uptown area of Butte, Montana. Each quadrant is delineated and enumerated. Transects followed roads and alleys and were completed by quadrant. (Map: M. Sutherland)

traps. At trap site 1, data were collected for 14 non-consecutive days from July 16 to October 8, 2015. During the same duration, data were collected from trap site 2, trap site 3, and trap site 4 for 19, 21, and 27 days, respectively. Traps were set in the morning and checked in the afternoon. Captured individuals were weighed then fitted with numbered colored leg bands (YIN.F ebay Store Company, China). We aged birds (juvenile, subadult, adult) based on development of cere and on iris coloration (Kautz and Seamans 1986).

During each trapping session, we also did a point count at the trap site to acquire the ratio of marked to unmarked birds not in the traps but present in the building. Observers would stand at a centralized point and view the surrounding area for two minutes. The total number of marked and unmarked birds seen perching at the trapping site was recorded.

Transect Surveys

In the previous study, the Central Business District was divided into quadrants and a walking transect was established in each quadrant (Figure 1). We used binoculars to look for marked individuals along these four transects as well as to count all pigeons observed. The transects ranged in length from approximately 6-8 miles (total of 25.8 miles) and were located along roads and adjacent sidewalks within each quadrant. Transects were surveyed every two weeks, at various times distributed equally among morning, mid-day, and evening. Transects were walked individually or in two-person teams. Observers

looked for pigeons and recorded the number of marked and unmarked pigeons seen, as well as a GPS location of the sighting and the closest physical address to sightings. Weather conditions and time-of-day were also recorded at the start of each transect.

RESULTS

Trapping and Point Count Surveys

From mid May 2015 through the end of January 2016, 83 feral pigeons were captured and banded (45 adults, 32 juveniles, and 6 subadults). The majority of these individuals (59) were only captured once, 11 were captured twice, six were captured three times, four were captured four times, two were captured five times, and one bird was captured 14 times.

We found minimal movement of individuals between colonies. We found only one individual that moved to an adjacent colony, 0.11 km away from the original trapping location.

Point-counts were conducted at colonies on 19 occasions (Figure 2). We found an average ratio of marked to unmarked birds of 3.7 ± 2.6 to 25.8 ± 13.9 across the four trapping sites (Figure 3).

Transect Surveys

From mid-May 2015 through the end of January 2016, each of our 4 transects was surveyed 12 times. The number of pigeons detected during these surveys ranged from 101 to 254 individuals (Figure 4). Five of the total of full transects showed individual counts between 150-

Figure 2. The number of marked and unmarked individuals detected at all trapping sites combined during point-count surveys.

Figure 3. Average number of birds re-sighted per individual trapping site across all trapping dates. Ratio is based on marked to unmarked birds.

Figure 4. Approximate number of pigeons seen during walking transect surveys across entire study area.

200 birds, with most of the other full transects slightly above and below those numbers (Figure 4). No banded pigeons were observed during these surveys.

DISCUSSION

Our preliminary data indicate that feral pigeons do not move between colonies as much as we expected. None of the individuals we banded as adults were ever detected in another colony. We did have one juvenile bird move to an adjacent colony approximately 0.11 km away. We saw little foraging away from the trapping areas, which suggests that there may be enough resources around the trapping areas to not have to search for available resources. This is consistent with the research by Murton et al. (1972), which found 85-87% of marked pigeons moved less than 100 yards away from the marking point. Murton et al. (1972) also stated that pigeons should be regarded as very sedentary under normal circumstances. Point-count surveys across all trapping sites found the average ratio of marked to unmarked birds being approximately three marked birds for every 25 unmarked, indicating that many more birds are present than we have been catching. We are experimenting with different types of traps and baits to determine the best methods for trapping pigeons.

Individuals marked at colonies have not been observed during our walking transect surveys. We feel this may be the result of low visibility of the leg bands: Often the birds are perched on ledges or overlooking overhangs of buildings, which conceals the leg bands; it also is difficult to observe banded birds when they are perched up high. Leg band tags could be beneficial when used in a ground-level re-sight scenario; if the pigeons frequented a plaza, mall, or town square area, the leg bands could prove to be beneficial. For high perching re-sights, patagial (wing) tags could prove to be a better marking method. Kautz and Seamans (1992) found patagial tags attached to feral pigeons have high visibility for re-sighting and low tag detachment rates. Only 0.77% of tags were detached over a 5-month period. The use of patagial tags should

allow for greater visibility of marked birds providing a more accurate re-sight count for both point-counts and transects.

CONTINUING WORK

Field work will continue into mid-summer 2016. A total of approximately 24 transects will be completed as well as ongoing trapping efforts. Continuous trapping efforts will provide a greater number of marked individuals and also greater numbers of re-capture data. Protocol amendments will allow for patagial tags using wide patches of ribbon to be applied. Once data collection is completed, data will be analyzed using MARK model fits to build population abundance estimates, survival rates, and prediction models to suit the feral pigeon populations (White and Burnham 1999) inside the CBD of Butte, Montana.

ACKNOWLEDGMENTS

We thank Butte Silver-Bow County for funding this study and the business owners in the CBD who allowed us access to their buildings. Thanks to Amy Kuenzi, Rick Douglass, and Emma DeLeon for all their support and guidance. Special thanks to our field technicians, Natalie Reget and Kyle Sweedman, for their good work and for the hundreds of miles walked. A final thank you to Mary Sutherland and John Morgan who helped with final formatting. Research methods were approved by University of Montana's Animal Care Use Committee (006-14SCMTECH-021014).

LITERATURE CITED

- Butte, 46°00'30" N and 112°32'33" W Google Earth. Aug. 18, 2015; June 7, 2017.
- Capoccia, S., and C. Boyle. 2014. Urban pigeon report: assessment of habitat and population. Report to Butte-Silver Bow County. Dept. of Biological Sciences, Montana Tech of the University of Montana, Butte, MT.
- Jerolmack, C. 2013. The Global Pigeon. University of Chicago Press, Chicago, IL. 288 pp.
- Johnston, R. F., and M. Janiga. 1995. Feral pigeons. Oxford University Press, New York, NY. 336 pp.
- Kautz, J. E., and T. W. Seamans. 1986. Estimating age of nestling and juvenile feral rock doves. J. Wildl. Manage. 50(4):544-547.
- Kautz, J. E., and T. W. Seamans. 1992. Techniques for feral pigeon trapping, tagging and nest monitoring. North American Bird Bander 17(2):53-59.
- Murton, R. K., R. J. P. Thearle, and J. Thompson. 1972. Ecological studies of the feral pigeon *Columba livia* var. I. population, breeding biology and methods of control. J. Appl. Ecol. 9(3):835-874.
- Saini, H., and H. Toor. 1991. Feeding ecology and damage potential of feral pigeons, *Columba livia*, in an agricultural habitat. Le Gerfaut 81(3-4):195-206.
- Sol, D., and J. C. Senar. 1995. Urban pigeon populations: stability, home range, and the effect of removing individuals. Can. J. Zool. 73(6):1154-1160.
- White, G. C., and K. P. Burnham. 1999. Program MARK: survival estimation from populations of marked animals. Bird Study 46 Suppl., pp. 120-138.