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American crow (*Corvus brachyrhynchos*) abundance in relation to different human-altered environments and levels of disturbance

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INTRODUCTION

Examining American crow (*Corvus brachyrhynchos*) habitat selection is valuable in understanding how this generalist species adapts to human-altered environments.

Urban wildlife management is instrumental as global rates of urbanization increase, to attempt to quantify habitat use and human-wildlife interactions (McDonnell 2011). The city of Arcata is proposing to build 3,500 new residential units with the Gateway Plan to meet population growth and housing demands by 2023 (Black 2022) making urbanization an increasingly relevant local issue.

Objectives of the study:

- (1) Are crows utilizing a specific type of anthropogenic environment significantly more than the other?
- (2) Is human and vehicle presence at the sites is significantly affecting crow abundance?

METHODS

I recorded observations of crow abundance at four sites in Arcata, CA, USA representing two habitat types; urban and agricultural. Site size was adjusted to a 50 meter radius circle using Google Earth.

Crow abundance was determined using standardized point counts at a fixed point to record crows present for 10 minutes. I counted all humans present within the site and number of vehicles (for 1 min interval) during the sampling period.

To test for differences in abundance between the sites I used a t-test. To test for correlation between number of crows, humans, and vehicles present I used a linear regression test.

LIT CITED

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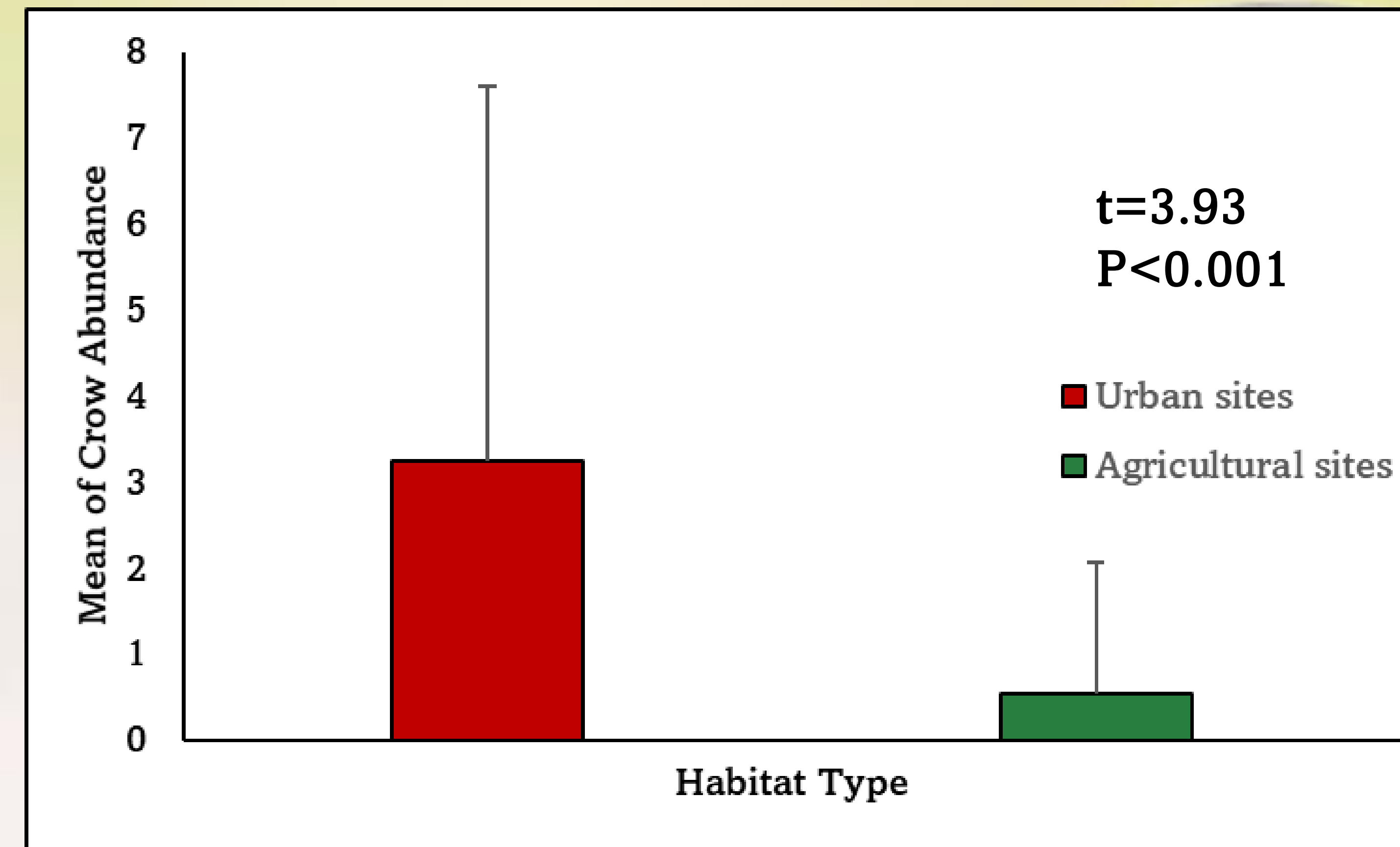


Figure 1. Mean abundance of American crows (Arcata, CA, USA). Abundance was significantly higher in urban sites than agricultural ($t = 3.93$, $df = 54$, $P < 0.001$).

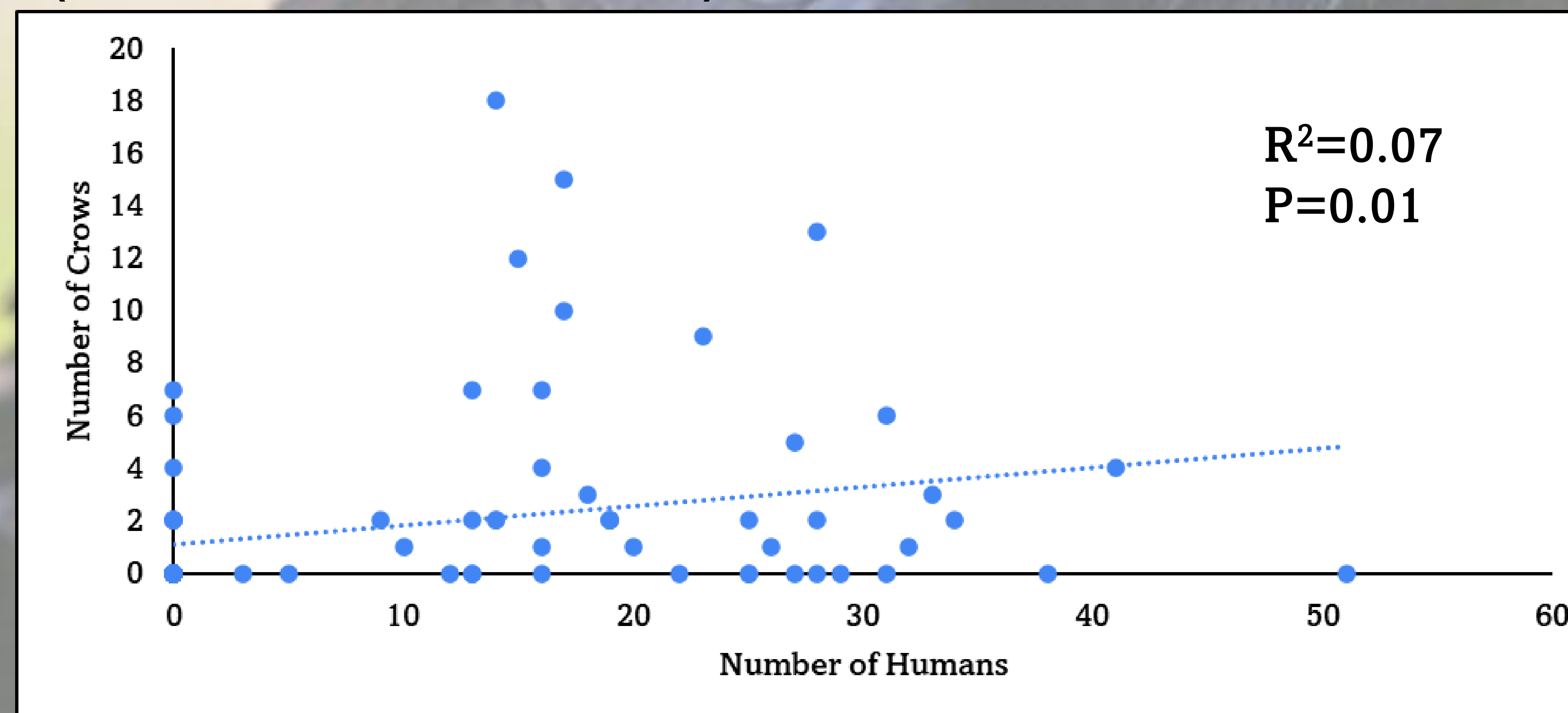


Figure 2. Number of crows observed and the number of humans during the sampling period is significantly correlated ($R^2 = 0.07$, $n = 88$, $P = 0.01$).

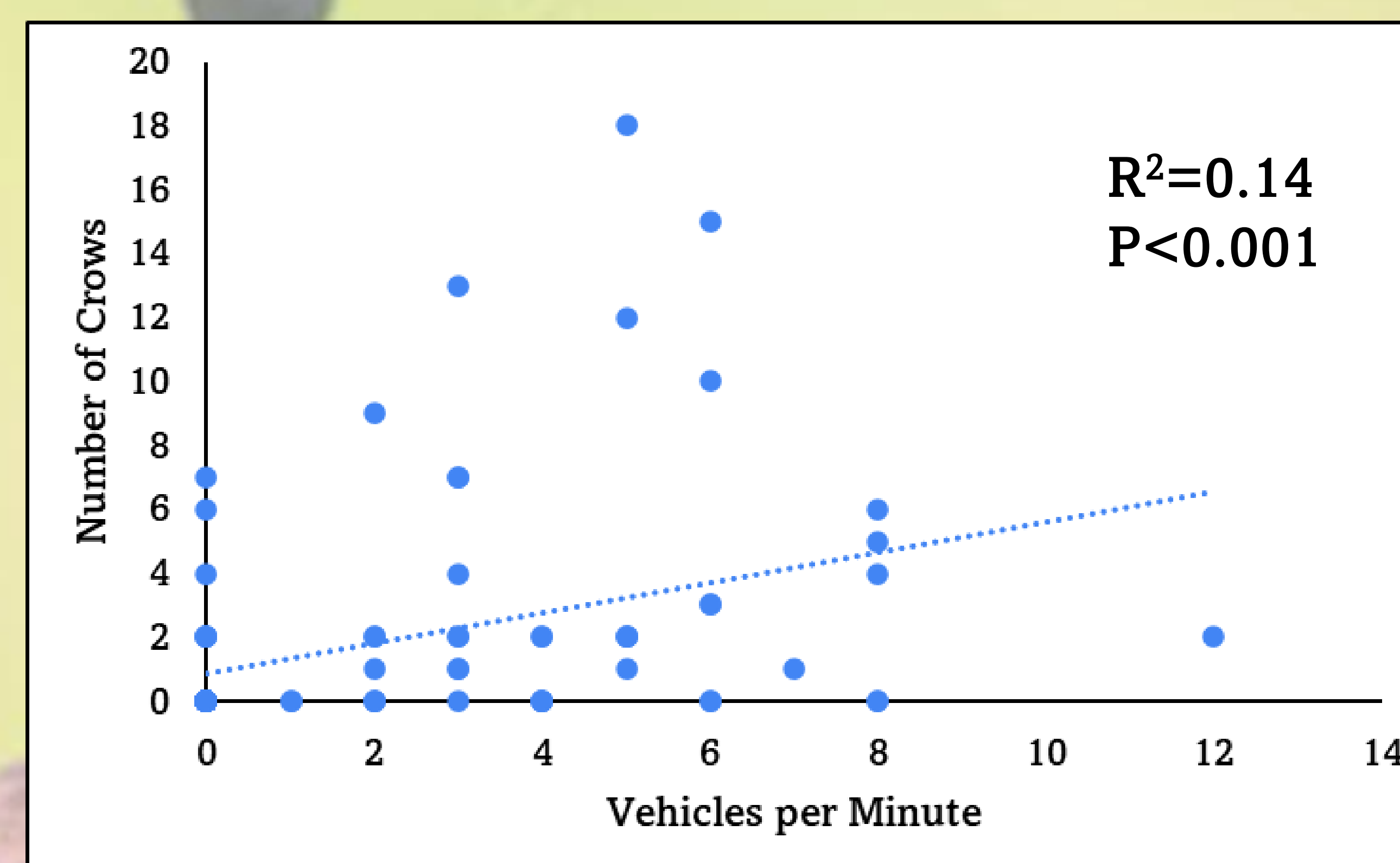


Figure 3. Number of crows and vehicle traffic (number of vehicles/minute) is significantly positively correlated ($R^2 = 0.14$, $n = 89$, $P < 0.001$).

RESULTS

A total of 89 observations were collected during the 8 week study period throughout four study sites located in Arcata, CA, USA.

Based on a t-test analysis crow abundance was significantly higher in urban sites (mean 32.24, SE 4.36) than on agricultural sites (mean 0.54, SE 1.52 ; $t = 3.93$, $df = 54$, $P < 0.001$, Fig. 1).

Crow abundance and human presence during the sampling period was significantly correlated ($R^2 = 0.07$, $n = 88$, $P = 0.01$, Fig. 2). Additionally, the number of crows and the average number of vehicles (per 1 minute sample) was significantly correlated ($R^2 = 0.14$, $n = 89$, $P < 0.001$, Fig. 3).

DISCUSSION

My results suggest that crows were selecting for urban sites over agricultural. This may be due to the abundance of high-calorie anthropogenic foods, habituation, and lack of repelling activities commonly conducted in agricultural areas (Townsend et al. 2019, Verbeek and Caffrey 2021).

Crow abundance was significantly positively correlated with both types of disturbances. This means that generally, there were more crows when there were more people and cars present. Crows are a highly intelligent species that habituate easily and may be cuing into human and subsequently vehicle presence as a sign that there will be a higher quantity of trash available.

In California, increasing degrees of urbanization have been associated with lower survival rates for American crow nestlings (Townsend et al. 2019). Studying *Corvus brachyrhynchos* abundance in different habitats in Arcata can provide a baseline of data of how this species is distributed and utilizing different anthropogenically altered areas in a city showing increasing rates of urban expansion.

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