Finding Effective Non-Lethal Management Strategies for Urban Populations of Eastern Coyote (*Canis latrans*)

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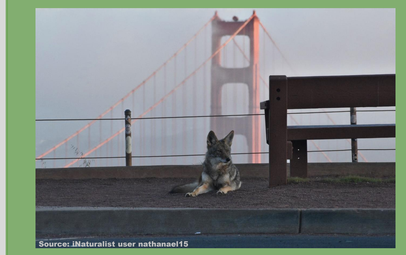
Background

- Human populations and urbanization are increasing across the world. This growth and expansion are increasing the frequency of human-wildlife interaction and conflict (Soulsbury & White, 2015). Physical attacks on pets and people, property damage, and vehicle collisions are only a handful of examples of interactions that have negative impacts to both humans and wildlife. These incidences present a critical need for comprehensive and effective management strategies (Schell, et al., 2020).
- The eastern coyote (Canis latrans) is a well-studied species that has adapted well to urban environments (Grubbs & Krausman, 2009). In these urban environments coyotes generally avoid areas of higher density and development (Dodge & Kashian, 2013; Gehrt, Anchor, & White, 2009; Grubbs & Krausman, 2009) and are not often involved in conflicts with humans (Gehrt, Anchor, & White, 2009; Breck, Poessel, & Bonnell, 2017). The cases in which a coyote-human conflict occurs it is often between humans and a “problem individual”. These problem individuals exhibit heightened boldness and aggression to individuals as a result of lack of fear of humans (Breck, Poessel, & Bonnell, 2017).



Source: iNaturalist user nathanael15

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Motivation

- Communities impacted by human-wildlife conflicts can often develop aggression towards wildlife and subsequently resistance towards conservation and environmental initiatives (Treves, Wallace, Naughton-Treves, & Morales, 2006). Effective management of problem individual coyotes is therefore crucial in supporting not only positive human-wildlife relationships, but other broader scale conservation efforts.
- I propose to evaluate how non-lethal management of urban coyotes influence the prevalence of problem individuals and human-coyote conflicts.

Hypothesis

- I hypothesize that there is a relationship between the prevalence of human-coyote conflict and hazing (deliberate negative stimuli), as well as the group size that is hazing.

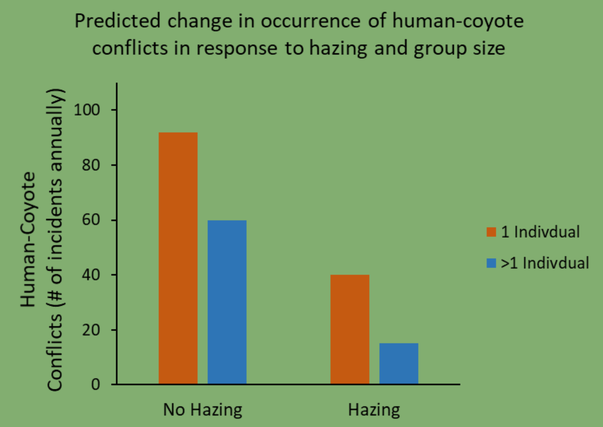

Figure 1: Predictions on how the frequency of human-coyote conflicts in urban environments would be influenced by different size of groups and hazing of coyotes.

Predictions

- I predict that prevalence of human-coyote conflicts, as measured by incidents in a year, will be lowest in areas where hazing occurs and is performed by groups containing more than 1 individual. I also predict that human-coyote conflicts will be highest in areas where no hazing occurs and in instances where individuals are alone (Figure 1).

Study Design

- Manipulative field experiments will be conducted in Denver and Colorado Springs CO. These 2 cities are among the top in the country for highest reported human-coyote conflicts each year (Poessel, Gese, & Young, 2017). 20 sites with reported or historical presence of coyotes, in both cities, will be used for treatments and control. In both city 5 sites will serve as a control (a researcher will be alone and will not haze coyotes), 5 sites will have 2 or more researchers not hazing coyotes, 5 sites will have a single researcher hazing coyotes, and 5 sites will have 2 or more researchers hazing coyotes.

Study Design

- This field experiment will span 6 months. At the conclusion of this period, another 6 months will be allowed to pass and the frequency of reported human-coyote conflicts at survey sites during this period will be measured to evaluate the effectiveness of treatment actions.

Figure 2: Instructional poster from open space citizen science project involving hazing of coyotes (Bonnell & Breck, 2017)

Intended Analysis

- Because the response variable for this experiment (number of human-coyote conflicts) is continuous, and the independent variable (treatments: >1 researcher w/ no hazing, 1 researcher w/ hazing, >1 researcher w/ hazing, and control) is categorical with more than 2 groups, I will analyze the data collected using a 2 factor ANOVA test. This statistical analysis will help to identify whether there is a difference in effect between hazing and group size, or if there is a relationship between these two treatment types.

Expected Benefits

- The presence of wildlife in urban environments and the occurrence of human-wildlife conflict are ubiquitous (Soulsbury & White, 2015). The case of the eastern coyote is no exception to this and as populations of this species continue to grow the identifying of management strategies that support coexistence with humans will become imperative. Development of these strategies will not only reduce human-wildlife conflicts, it will improve relationships between wildlife and humans.

Figure 3: Informative graphic with helpful tips on coexisting with coyotes. (http://www.projectcoyote.org)

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