

Pup Presence Impact on Black-tailed Prairie Dog (*Cynomys ludovicianus*) Alarm Call

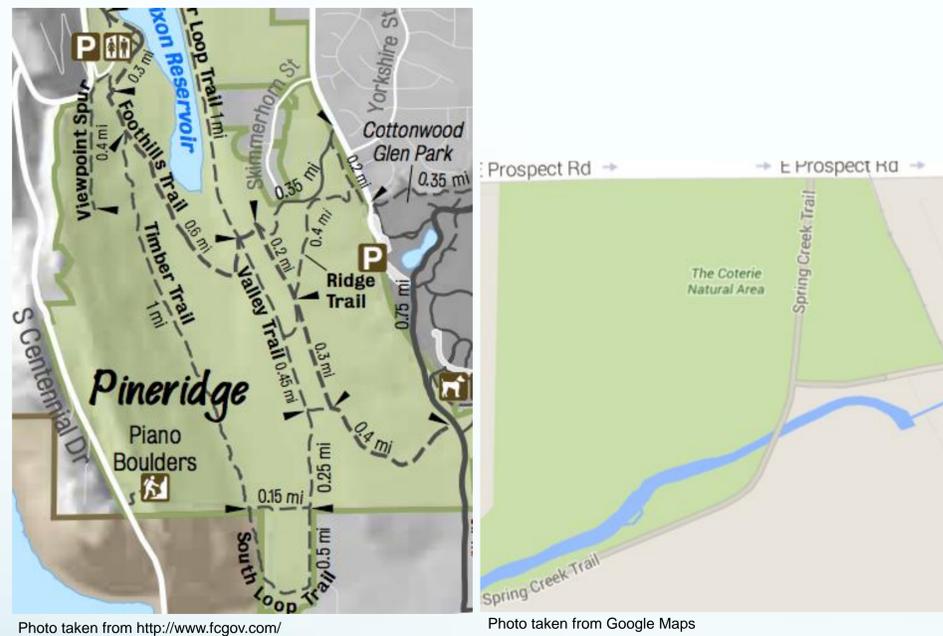
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Introduction

- Vocal communication is important for many species' survival and reproductive success
- Black-tailed prairie dogs depend heavily on altruistic vocal communication (Hoogland, 1995)
- Can occupy areas of heavy human-development; lots of loud anthropogenic noise
- Invest a large amount of energy into raising young, whether immediate kin or not (Hoogland, 1983)
- We explored how this altruistic communication is altered during periods of heavy parental care, as well as what impacts anthropogenic noise may have on this communication
- Hypothesis: The presence of pups and increased anthropogenic noise will alter the call characteristics of the anti-predator alarm calls

Study Sites

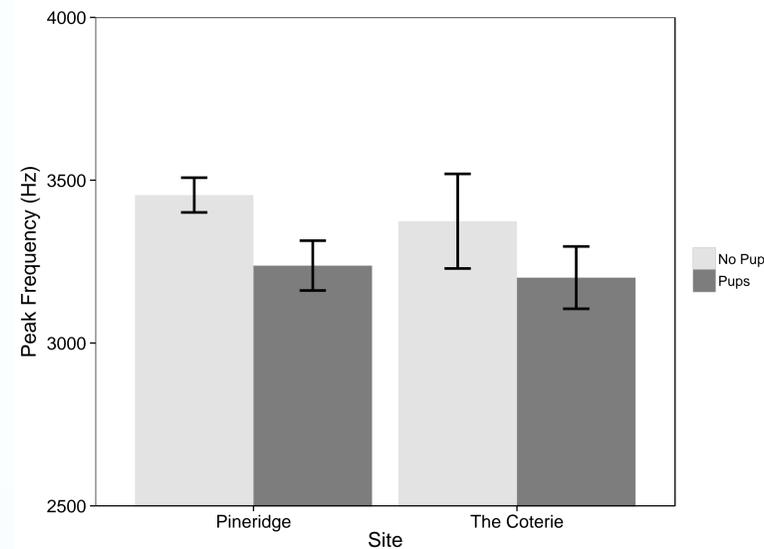


Materials and Methods

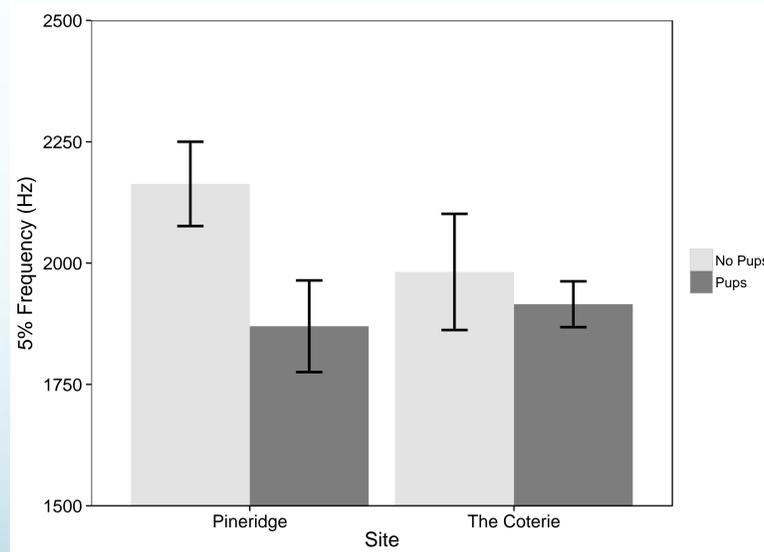
- Anti-predator alarm call recordings taken for 30 seconds using boom microphone
- Ambient sound recorded for 2 minutes with an ambient recording device
- 51 samples taken at each site
 - The Coterie Natural Area - High anthropogenic noise site
 - Pineridge Natural Area - Low anthropogenic noise site
- Vocal recordings analyzed in Raven Pro 64 1.5
- Ambient sound data analyzed in SLM Utility for LAeq value

Results

- In presence of pups, alarm calls were adjusted to:
 - Lower frequency main concentration of energy
 - Lower bottom frequency
- These results were consistent across sites and noise gradients



Peak frequency versus site, with presence of pups and without presences of pups. At Pineridge, the peak frequency without pups is about 3500 Hz, while at the Coterie, without pups, the peak frequency is about 3400 Hz. With pups, the peak frequency at both sites drops to 3200 Hz.



5th percentile frequency versus site, with presence of pups and without presences of pups. At Pineridge, the 5th percentile frequency without pups is about 2200 Hz, while at the Coterie, without pups, the peak frequency is about 2000 Hz. With pups, the peak frequency at both sites drops to 1900 Hz.

Discussion

The adjusted call in the presence of pups represents an altered call function in the presence of pups. Lower frequency calls can reach farther distances with less energy behind them. Therefore, the function of this altered call may be to alert the colony, while calling quieter, so to avoid attracting the predator towards the pups.



Photo from Google Images

No alterations to the alarm calls were found as a result of increased anthropogenic noise. Since a majority of the anthropogenic background noise is lower frequency sounds (cars, tires, etc.), this interferes with the alarm calls. As anthropogenic noise increases, this could impact the ability of black-tailed prairie dogs to alert colony members of danger, and impact the survival of pups in the spring.

References:

- Hoogland, John L. "Nepotism and Alarm Calling in the Black-tailed Prairie Dog (*Cynomys ludovicianus*)." *Animal Behaviour* 31.2 (1983): 472-79.
- Hoogland, John L. *The Black-tailed Prairie Dog: Social Life of a Burrowing Mammal*. Chicago: U of Chicago, 1995. Print.

