

# An Ounce of Prevention: Quantifying the Effects of Non-Lethal Tools on Wolf Behavior

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## Introduction

- Human-carnivore conflict is on the rise as human populations grow and carnivore conservation efforts gain precedence<sup>1</sup>
- Conflict behaviors exhibited by carnivores are often learned<sup>2</sup>
- Reducing learning potential through the use of non-lethal tools is important for coexistence

## Objectives

- Measured how prior experience (i.e., learning) influenced the motivation and persistence of captive wolves (*Canis lupus*) seeking a food reward

## Methods

- Pre-Trial: Conditioned wolves received a food reward from unsecured bear canisters, non-conditioned wolves were conditioned to canisters only (Fig. 1)
- Trials: Placed food reward in secured bear canister and recorded behaviors (Table 1) over 3 trials (8hrs/trial, ~1wk apart) for both conditioned and non-conditioned wolves
- Quantified latency to first behavior (i.e., motivation) and duration (i.e., persistence) of behaviors using video footage coded in NOLDUS Observer XT

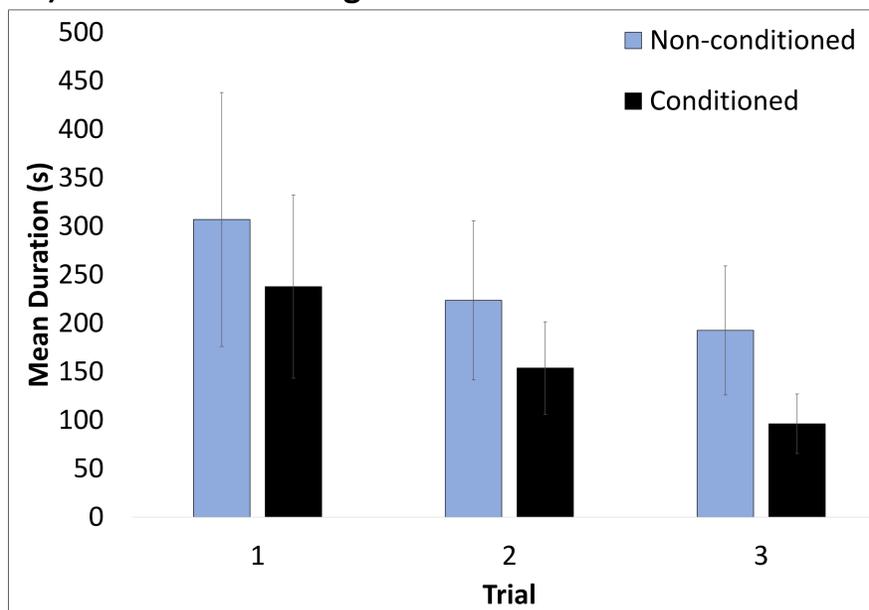


Fig. 1. Bear canisters were chained to fence enclosures.

## Results

- Conditioned wolves were more motivated than non-conditioned wolves to gain reward (i.e., shorter latency to first investigative and work behaviors;  $P < 0.05$ )
- Latency to first investigative behavior was 11 times faster and latency to first work behavior was 4 times faster for conditioned wolves versus non-conditioned wolves
- We found evidence of decreased persistence to investigate and work to obtain secured rewards with time (i.e., duration of both investigative and work behaviors decreased over the course of our 3 trials;  $P < 0.10$ ) (Fig. 2)

A) Duration of Investigative Behaviors



B) Duration of Work Behaviors

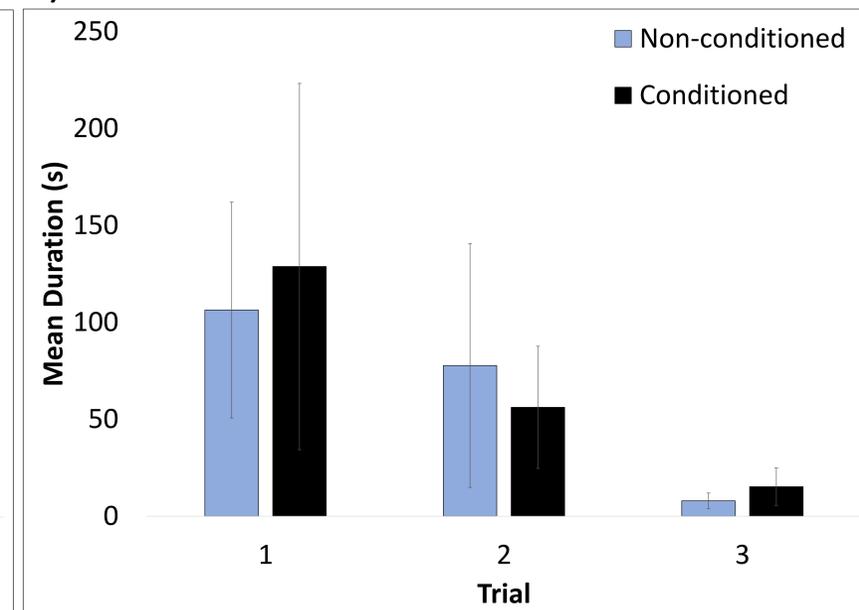


Fig. 2. Mean duration of behaviors controlled for the number of wolves in each pen. All pens contained >2 wolves.

Investigative	Work
Sniffing	Pawing
Scratching	Chewing
Licking	Tugging
Nudging	Pinning

Table 1. Behaviors were assigned to one of two categories. Investigative behaviors are exploratory in nature and work behaviors demonstrate effort to access secured reward.

## Discussion

- Our results indicate that the use of prevention measures can curb learning in carnivores and are important for non-lethal carnivore management
- This study reinforces the importance of proactive use of non-lethal tools to prevent conflict behaviors and supports reactive use of tools that effectively exclude carnivores from attaining future rewards

## References

<sup>1</sup>Woodruffe et al. 2005, <sup>2</sup>Linnell et al. 1999