Non-lethal and lethal management of carnivores: effectiveness and side-effects

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The gold standard in biomedical research and psychology is the randomized, controlled experiment.

Treatment or placebo?

Why is gold the standard we should follow in predator control?

It avoids one of the top two most pernicious biases in science (selection bias and researcher bias).
So far no gold-standard experiments on lethal control of coyote-sized or larger carnivores to prevent predation on domestic animals have proven reliable (Treves et al. 2016, 2019 van eeden et al. 2018).

Before-and-after comparison: Everyone gets the treatment + time passes (2 variables confound results so inference is at most half as strong)
Gold-standard experiments that found effective non-lethal methods to protect domestic animals

livestock-guarding dogs

Davidson-Nelson et al. 2010; Gehring et al. 2010; Ohrens et al. 2019; Radford et al. in press.
Coyote-sized fladry

Fladry sized for coyotes, a field experiment underway by Abi Fergus in Wisconsin

Gold-standard experiment with captive coyotes (Young et al. 2015, 2017)
Why is my focus on livestock pertinent?

Side-effects and counter-productive effects of lethal management

Rural coyotes, cougars, and wolves give us important clues about urban coyotes.

- Killing culprit coyotes in farm and rural settings has been difficult and more often than not has exacerbated or spread the threats to human interests.
Side-effects and counter-productive effects of lethal management

Wisconsin and Michigan residents became less tolerant of wolves and poached more wolves when the government used lethal control on wolves.

Cougars From Washington state showed a counter-productive reaction to recreational hunting.
Side-effects and counter-productive effects of lethal management

...associated with 15-9% slow-down in wolf populating growth (Chapron & Treves 2016a,b, 2017a,b)

...did not improve attitudes to wolves or reduce intentions to kill wolves. (Treves et al. 2013, Bronwe-Nuñez et al. 2015; Hogberg et al. 2015).

G. Chapron, PhD

F. Santiago-Ávila, PhD & his dogs Leeloo and Ninja

.... associated with 11-34% more cryptic poaching (Santiago-Ávila et al. 2020)

L. Naughton, PhD

C. Browne-Nuñez, PhD

J. Hogberg, MS
Citations to evidence (by slide number)

Slides 2-3 references [1, 2]
Slide 4 references [3-6]
Slide 5 references [7]
Slide 6 references [1, 2, 8, 9]
Slides 7-10 references [10-24]
References and Citations

15. Santiago-Avila, F.J. et al. (2020) Liberalizing the killing of endangered wolves was associated with more disappearances of collared individuals in Wisconsin, USA. Scientific Reports, 10:13881.
Coyotes in Your Backyard: A Novel Challenge of Wildlife Conflict Management

Dr. Eric Strauss, President’s Professor of Biology Executive Director, LMU Center for Urban Resilience CURES

LMU Cures photo of two coyotes in Ballona Freshwater Marsh, across the street from Playa Vista, CA
Cat Fatalities in Culver City over the Past Three Years (n=83)

The missing and fatally wounded cats are clustered around the Ballona Creek sluiceway and Baldwin Hills Reserve
The Characteristics of Urban Ecological Communities?

- Fragmented habitats
- Reduction in top predators
- Changes in productivity
- Changes in stress-related factors, such as temperature or nutrients
- Changes in species composition
- Human Activities
  - Increased spatial heterogeneity
  - Changes in trophic control
  - Local extinction
  - Changes in spatial and temporal scales
• Very adaptive meso-predator
• Population increase and expansion over the last century – following suppression of larger mammalian carnivores
• Usually live in family groups
• Omnivorous – very wide diet niche (think – teenage boy)
• Courser – travel long distances while foraging – highly opportunistic
• Can live 10+ years, but greatly reduced in cities as a result of anthropogenic forces
• Vary in size from 25-60lbs
• Males disperse from natal group
• Reproductive ecology drives temporal variation in foraging behavior
The categorization presented by Timm, et al. (2004) provides a typical interpretation of increasing risks as considered by municipalities. These patterns vary by location, seasonality and the likely ecological history of individual coyotes in a given neighborhood.

1. https://digitalcommons.unl.edu/vpc21/1
Aggregate, but incomplete data from multiple studies suggest that lethal removal can result in local increases in coyote population density as a result of social disruption and changes in the reproductive patterns. (graphic from Humane Society of the United States)
1. Community engagement must have full participation
2. Hazing efforts must be consistent
3. Yard risk assessment and management (Safety survey)
4. Formal Curriculum *Urban Eco Lab*

*Right:* Dr. Melinda Weaver, Postdoctoral Fellow at CURes, Leading Coyote Management Study in Culver City, CA

*Left:* Dr. Numi Mitchell, Conservation Agency in Rhode Island, with Los Angeles area high school and college student researchers from CURes