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

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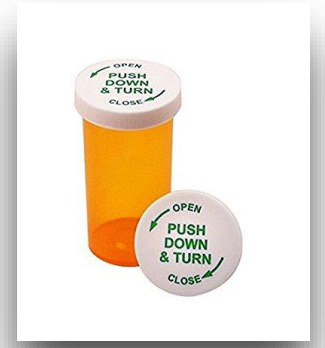
Project Coyote Science Advisory Board

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?

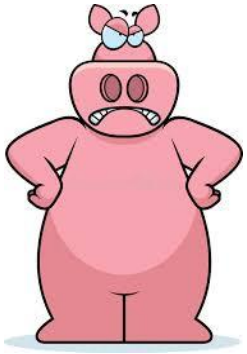
it avoids one of the top two most pernicious biases in science (selection bias and researcher bias).

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).

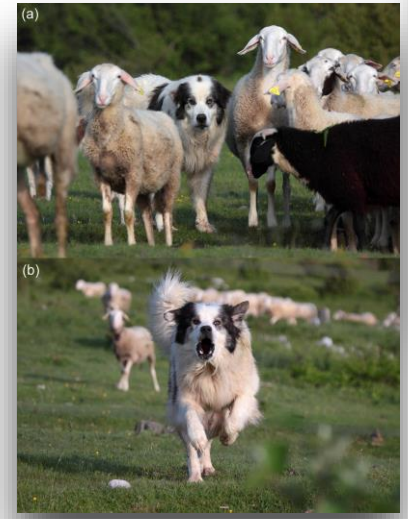
Before-and-after comparison: Everyone gets the treatment + time passes (2 variables confound results so inference is at most half as strong)

TIME

?

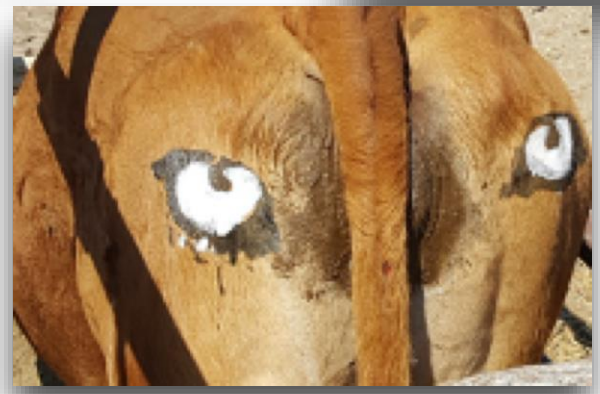


Gold-standard experiments that found effective non-lethal methods to protect domestic animals



livestock-guarding dogs

fladry



Eye-spots

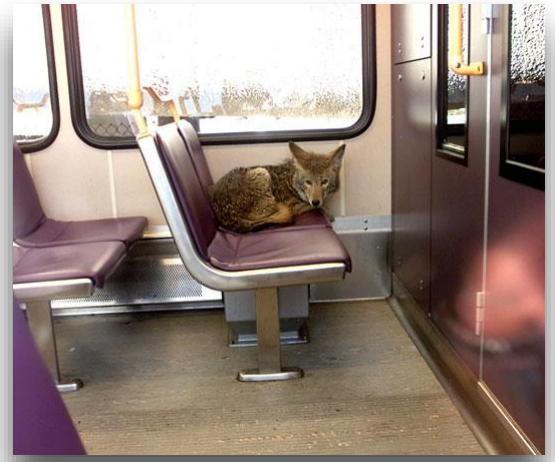
Davidson-Nelson et al. 2010; Gehring et al. 2010; Ohrens et al. 2019; Radford et al. in press.

Coyote-sized fladry

Gold-standard experiment with captive coyotes (Young et al. 2015, 2017)

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

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

Michigan wolves showed a counter-productive response to government lethal control.

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

G. Chapron, PhD

…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).

C. Browne-Nuñez, 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

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]
Slide 7-10 references [10-24]

References and Citations

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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)

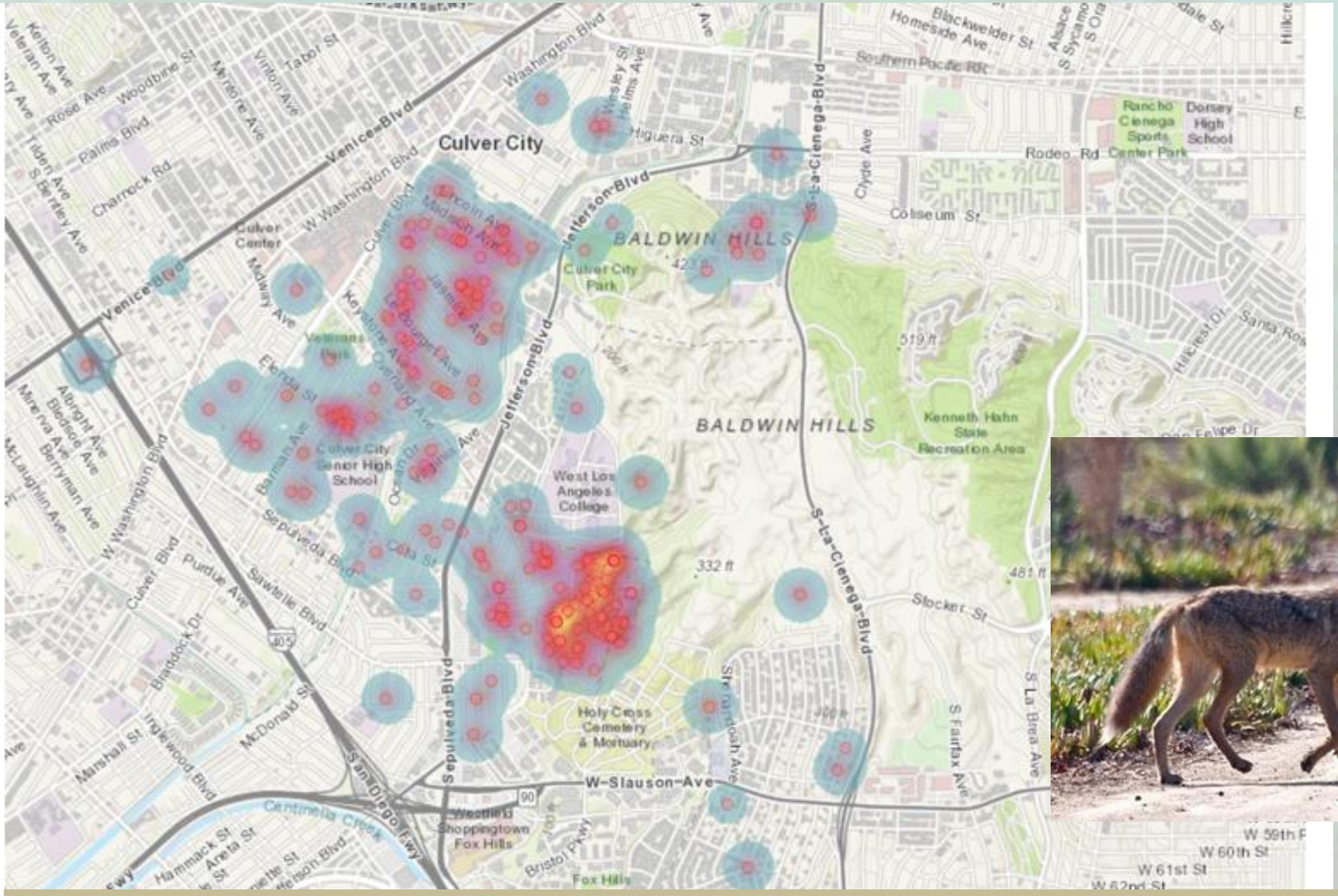


Photo by Carl Richards

The missing and fatally wounded cats are clustered around the Ballona Creek sluiceway and Baldwin Hills Reserve

The Characteristics of Urban Ecological Communities?

Coyote basic natural history

- *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*

Photo by Carl Richards

Loyola Marymount University

Coyote aggressiveness is scalar and follows predictable patterns in urban communities

Table 1. Sequence of increasingly aggressive coyote behaviors.

Increasing Aggression

1. Increase in coyotes on streets and in yards at night
2. Increase in coyotes approaching adults and/or taking pets at night
3. Coyotes on streets, and in parks and yards, in early morning/late afternoon
4. Coyotes chasing or taking pets in daytime
5. Coyotes attacking and taking pets on leash or near owners; chasing joggers, bicyclists, other adults
6. Coyotes seen in and around children's play areas, school grounds, and parks in midday
7. Coyotes acting aggressively toward adults in midday

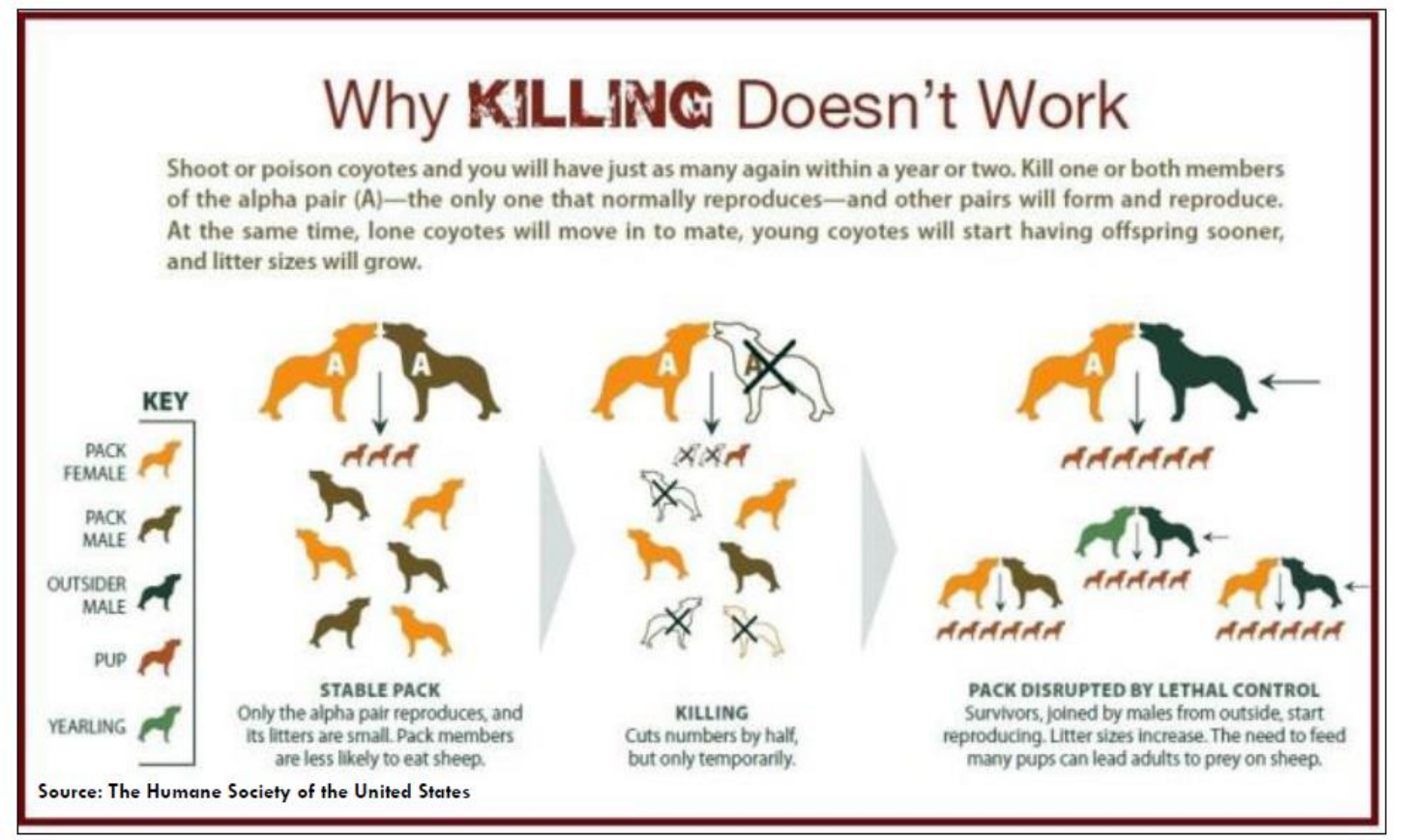
The categorization presented by Timm, et al. (2004) provides a typical interpretation of increasing risks as considered by municipalities

These patterns vary by location, seasonality and the likely ecological history of individual coyotes in a given neighborhood

Timm, R. M.; et al., "Coyote Attacks: An Increasing Suburban Problem" (2004). Proceedings of the Twenty-First Vertebrate Pest Conference (2004). 1. https://digitalcommons.unl.edu/vpc21/1

Loyola Marymount University

Especially in urbanized settings, lethal control is likely ineffective over multiple years and may be counter-productive



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)

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Education, both formal and informal is a crucial element of successful management interventions

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