Livestock Protection Tools for Cattle Ranchers

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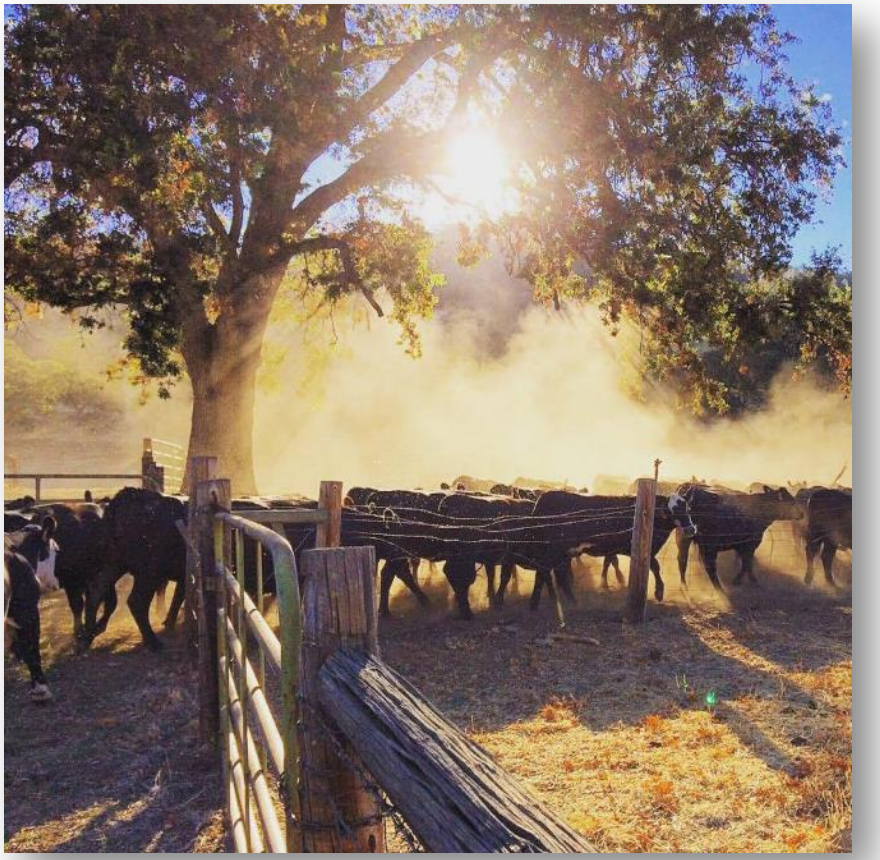
Overview

- My background
- Putting predators in context
- What are we really talking about?
- Tools
- Questions

Photo: L. Macon

Background

- Practical experience
  - Commercial sheep production
  - Large-scale targeted grazing
  - SFREC Herdsman
- Academic interests
  - Direct/Indirect Impacts from Predators
  - Livestock Protection Tools for California Ranchers (in review)
  - Paying for Presence (Master's paper)
  - LGD Behavior Project

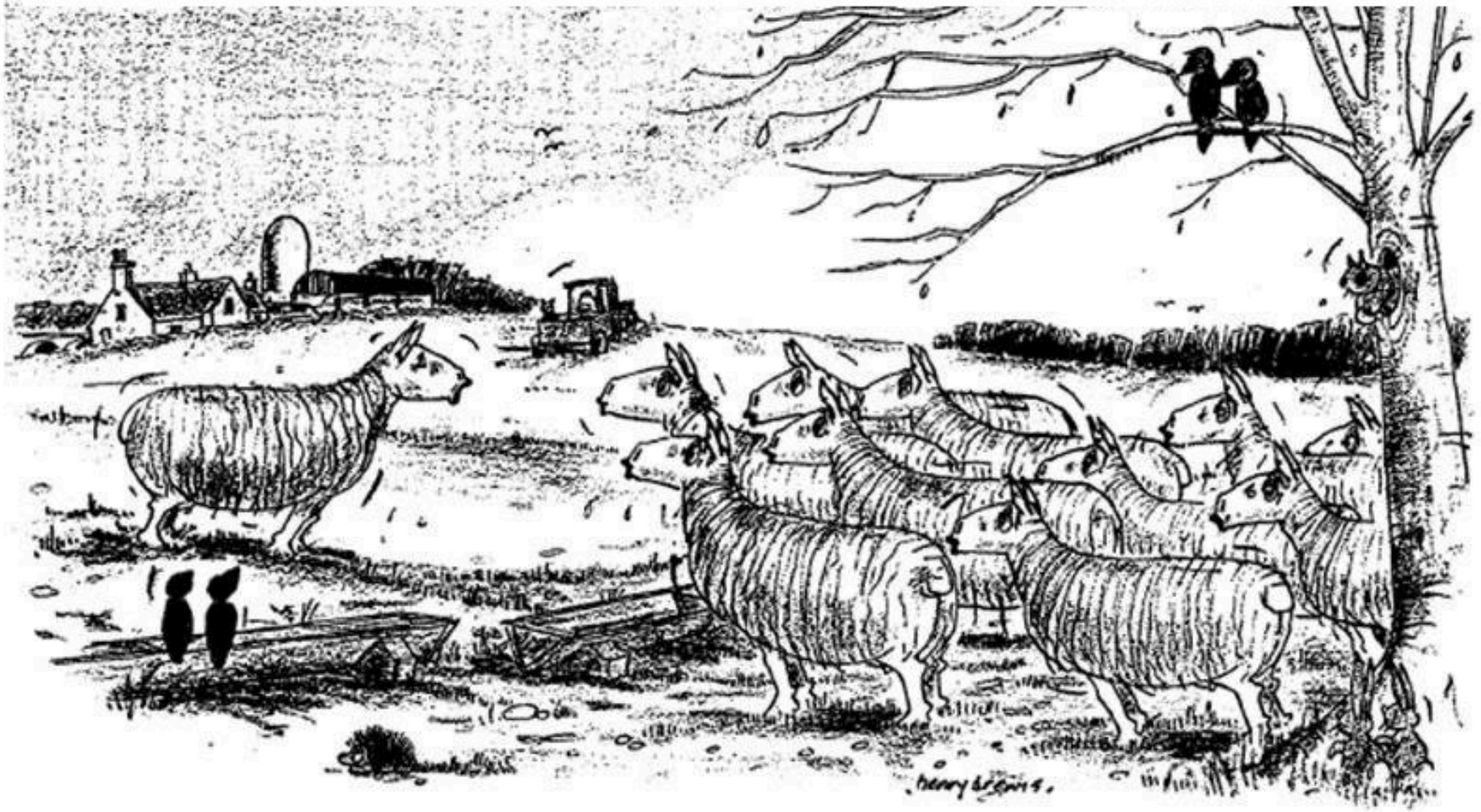


Predation in Context

Death losses by cause	Beef Cattle (2015)		Sheep (2014)	
	#	%	#	%
Death losses from predators – mature animals	1,103	1.1	2,277	19.0
Non-predator losses – mature animals	98,897	98.9	9,723	81.0
Death losses from predators – calves/lambs	8,178	5.8	3,171	45.3
Non-predator death losses – calves/lambs	131,822	94.2	3,829	54.7

Adapted from USDA APHIS data.

"Listen, girls - it's getting to be that time of year again when we have to decide who is going to drop dead for no apparent reason."



More Context

- Predation impacts can be very significant locally
- The selection of specific tools is based on socio-economic factors:
  - Cost-benefit analyses
  - Cultural attitudes
  - Market pressures
  - Carnivore ecology
- Economic costs
  - Direct losses
  - **Indirect impacts** (see Ramler 2014)
  - UC Study

Livestock Protection Tools

Beef Cattle Producers (2016) (20% used any nonlethal tool)		Sheep Producers (2014) (58% used any nonlethal tool)		Goat Producers (2014) (93% used any nonlethal tool)	
Tool(s)	%	Tool(s)	%	Tool(s)	%
1. Guard animals only	26.3	1. Fencing only	14.3	1. Other nonlethal	22.8
2. Fencing only	15.5	2. Guard dogs only	9.0	2. Fencing only	12.5
3. Other nonlethal	5.1	3. Fencing and Guard dogs	6.0	3. Guard dogs only	6.2
4. Frequent checks only	5.1	4. Night penning only	3.4	4. Guard dogs and Fencing	3.9
5. Guard animals and Fencing	4.1	5. Guard donkeys only	2.7	5. Fencing and Other nonlethal	3.1

Adapted from USDA APHIS data.

	If your predator of concern is a:						
Consider these tools:	Dog	Coyote	Mtn Lion	Black Bear	Gray Wolf	Fox	Bobcat
Livestock guardian dog	●	●	●	●	●	●	●
Donkey	●	●	**NA**	**NA**	**NA**	●	**NA**
Llama	●	●	**NA**	**NA**	**NA**	●	**NA**
Woven-wire fencing w/ trip wire	●	●	**NA**	**NA**	**NA**	**NA**	**NA**
Permanent electric fencing	●	●	●	**?**	●	●	●
Temporary electric fencing	●	●	**?**	**NA**	●	●	●
Electro-net fencing	●	●	**NA**	**NA**	**NA**	●	●
Fladry or turbo fladry	**NA**	**?**	**NA**	**NA**	●	**NA**	**NA**
Attractant (carcass) removal	●	●	●	●	●	●	●
Human presence / stockmanship	**NA**	**NA**	**NA**	**?**	●	**NA**	**NA**
Night pen (small-scale operations)	●	●	●	●	●	●	●
Fright tactics / devices	**NA**	**?**	**?**	**?**	**?**	**?**	**?**
Shed lambing / calving / kidding	●	●	●	●	●	●	●
Multi-species grazing (cattle w/ small ruminants)	●	●	**?**	**?**	**?**	●	**?**

● Highly effective ● Moderately effective **?** Research results with varying effectiveness **NA** No available evidence

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Adapted from *Livestock Protection Tools for California Ranchers* (in review)

Livestock Guardian Dogs

- Common breeds (big white dogs!)
- New breeds (in U.S.): Kangal, Karakachan and Cao de Gado Transmontano
- Appear to protect stock without displacing predators (Coppinger et al 1988)
- May increase grazing efficiency (Weber et al 2015)
- Can be effective on operations of all types/scales (VonBommel and Johnson 2012)
- Pros and cons

Donkeys

- Typically cheaper to buy/keep than dogs
- Must not have access to rumensin!
- Effective with coyotes, dogs and foxes
- Most effective in pastures under 600 ac and with less than 400 hd
- Must be properly bonded
- Most producers remove donkeys during birthing season
- Not as effective in extensive settings
- See Andelt (2004) for more information

Llamas

- Same dietary requirements as ruminants
- Can be effective on small to mid-sized operations (250-300 head on 250-300 ac pastures)
- Wild South American camelids have been observed to chase foxes and flee from cougars
- Single llamas work best
- Not all llamas are naturally aggressive towards coyotes and dogs
- See Andelt (2004)

Attractant Removal

Photo: Travis Trailers

- Many predators are opportunistic scavengers – attracted to dead, sick, injured animals – and bone yards)
- LGDs may be drawn away from livestock (leaving them unprotected)
- Removal presents logistical and legal issues
  - Illegal to compost in CA
  - Check with county environmental health dept. re: burial
  - Retrieval/rendering may be cost prohibitive

Woven-wire Fencing

- Physical barrier to predators
- Most effective with additional psychological barrier
  - Top barbed or electrified wire
  - Outside trip wire
- Adult coyotes can squeeze thru 4x6” opening!
- Expensive to construct and maintain!

Photo: indianaagriculturalfencing.com

Permanent Electric Fencing

Photo: Kencove Fencing

- Mostly a psychological barrier
- Typically 8-12 wires, alternating hot and ground
- May include outside trip wire
- Maintenance is critical!
- Dry soil conditions, grounding on vegetation or itself, or poor construction may contribute to ineffectiveness

Temporary Electric Fencing

- Often used to control grazing on irrigated pasture, in sensitive areas, etc.
- Poly-wire or tape with steel wire for conductivity
- Can be part of multiple-tool approach (typically with livestock guardian animals)

Photo: Rutland Electric Fencing

Electro-Net Fencing

Photo: E. Macon

- A more protective version of temporary electric fence
- 36-48” high, 164-ft sections
- Requires high-capacity energizer
- Shorter lifespan (5-7 yrs)
- Not an option in extensive operations
- Can reduce/eliminate coyote incursion into pastures (Matchett Breck and Callon 2013)

Fladry and Turbo-Fladry

- Fladry is a series of cloth flags attached to rope or electrified wire (turbo fladry)
- Creates novel visual stimulus that wolves (and other canids?) fear
- Habituation seems to occur in 60-90 days
- May be useful in specific applications (e.g., calving pastures)
- See Musiani et al (2003) and Young Miller and Essex (2015)

Human Presence / Stockmanship

- Large-scale sheep/goat producers often utilize herders
- Range riders have been employed by individuals and groups to deter predators
- Habituation and cost are concerns/ barriers
- Some producers working to re-instill herd behaviors (to fight off predators)
- Can help with public perception (Parks 2015)
- May also help identify/remove sick or injured animals

Night Penning

Photo: Hopland REC

- Penning livestock in predator-proof enclosure during nighttime hours
- Can be effective for small operations or specific times of year
- Increases capital and labor costs
- Potential for increased livestock health problems
- See Espuno et al (2004)

Fright Tactics and Devices

- Novel stimuli (strobe lights, propane cannons, sirens, etc.) frighten some predators
- Random vs. behavioral activation impact habituation
- Limited geographic scope
- May have place in multi-tool approach

Photo: WA Poultry Equipment

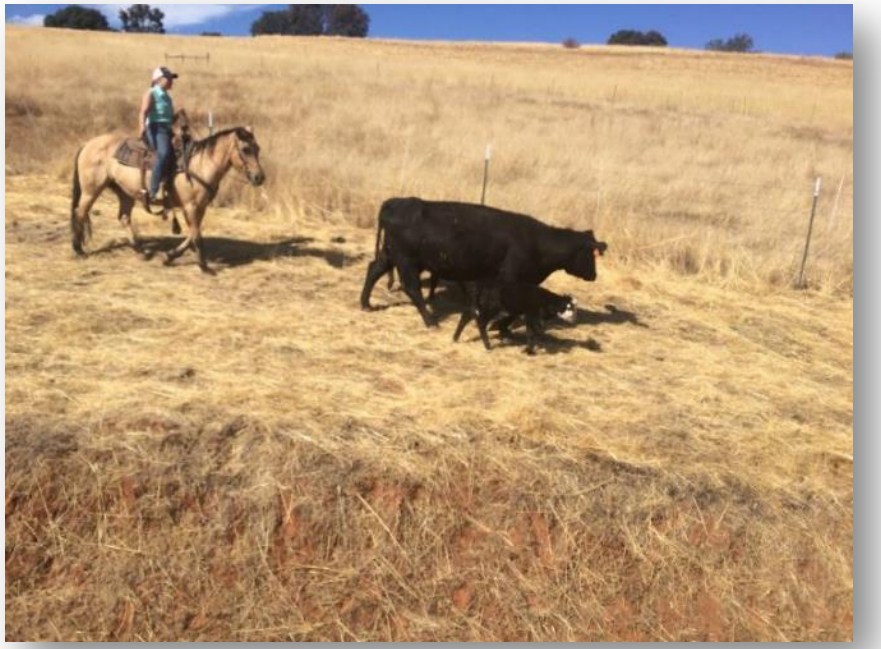
Culling Older Animals

- Older animals may be more prone to predation – culling can remove a predator attractant
- Culling decisions are generally based on behavioral, productivity and health factors (rather than predation)
- Temple Grandin has suggested that by selecting for docility, we're reducing protective behaviors in cows

Altering Production Calendar

- Predators typically have the greatest demand for prey during late gestation and early lactation
- Barriers to altering production calendar:
  - Forage quality/quantity
  - Weather
  - Lengthy gestation
  - Markets
  - Lease requirements

Targeted Human Presence

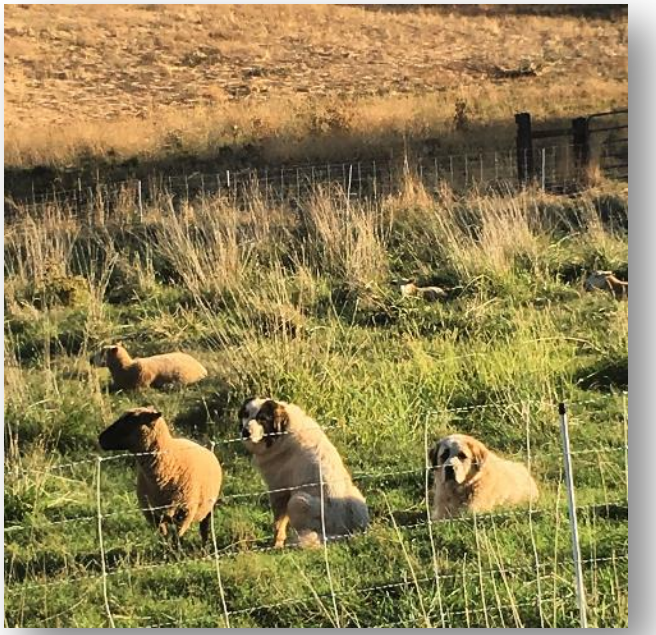


- More frequent checks in high predation areas or seasons
- Requires producers to observe and be knowledgeable about predator behavior and habitat use
- Can focus additional expense and labor on key times

Tool Adoption

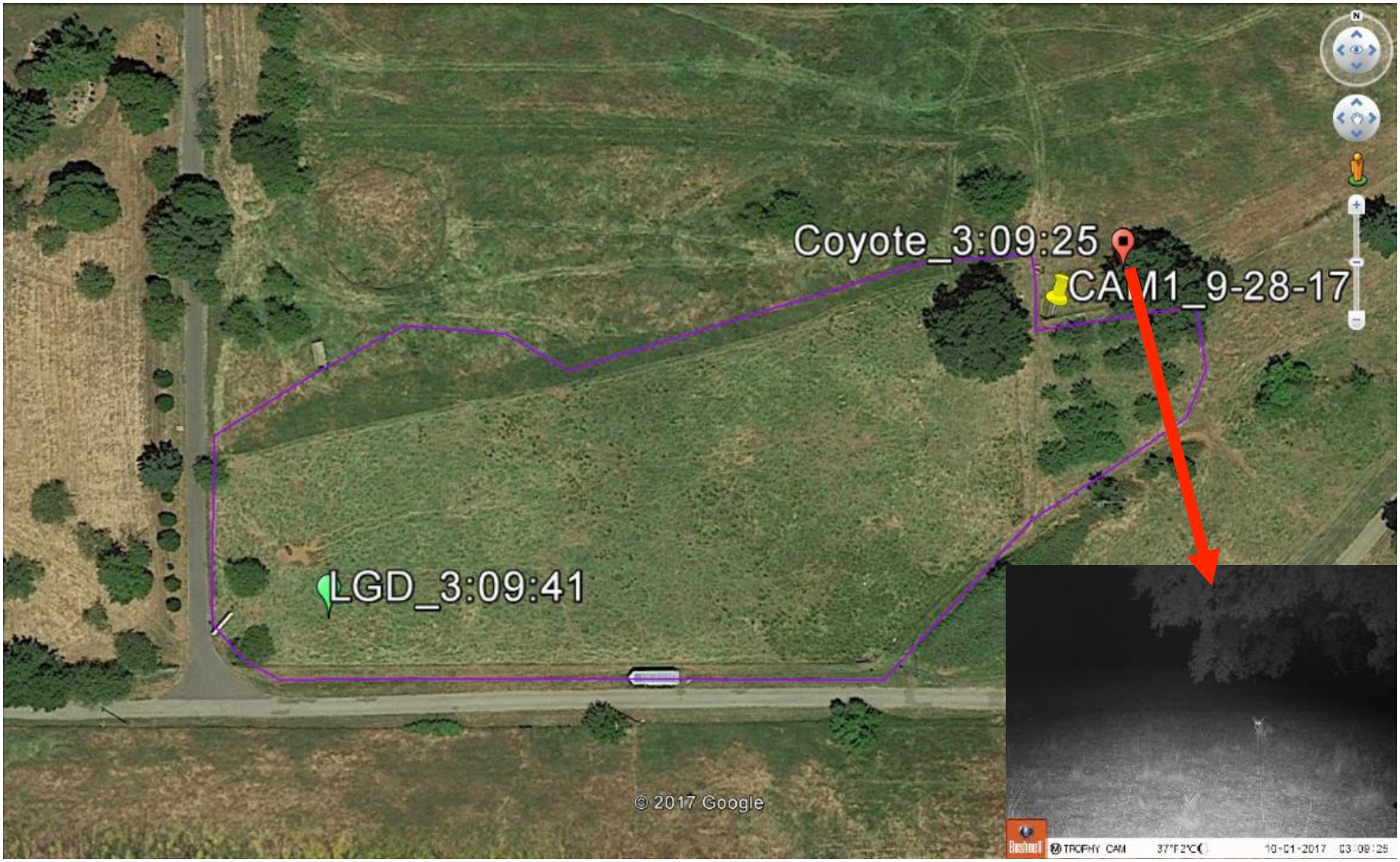
- Combinations of tools and adaptive management are key
  - Avoid habituation
- "Tool" might be a bad label – these are largely biological and behavioral techniques

- "Show Me"
  - Demonstrations
  - Peer-to-peer is critical



Additional Research and Demonstration

- Efficacy vs. mechanisms
  - Difficult to measure something that doesn't happen!
  - Control vs. treatment – do any of us want to be in the unprotected "control" group?
  - Maybe the key question is ***how*** these tools work!
- LGD Project
  - Collaring LGDs and sheep
  - Paired with trail cameras to detect wildlife
  - Demonstrate LGD behavior relative to specific predators and in specific habitats


Coyote_3:09:25
CAM1_9-28-17
LGD_3:09:41
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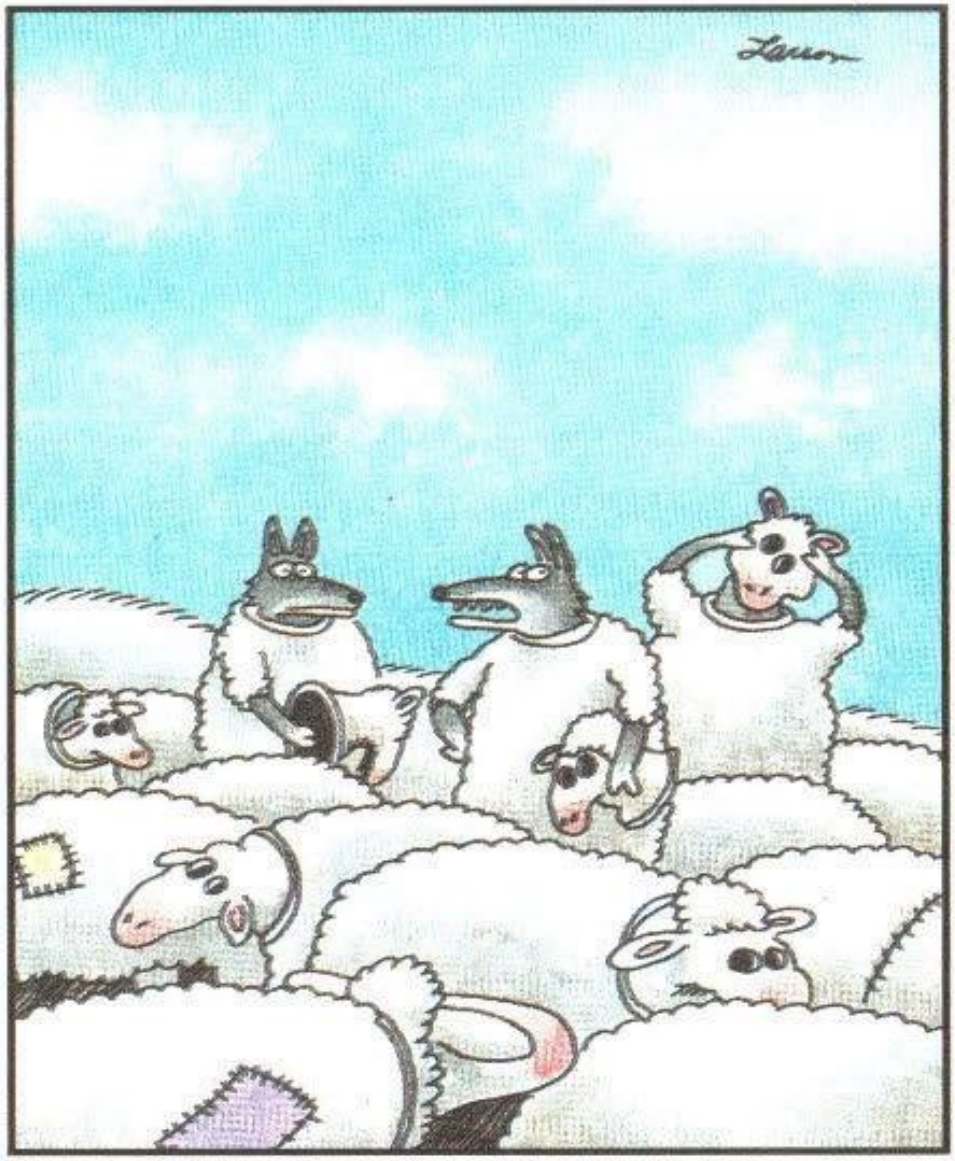
Using Tools on Recreation Lands

- Liability issues
- Selecting the right LGD for the job
- Barriers to recreation (fences, etc.)
- Limitations on management changes (e.g., calving season or class of livestock)

A Few Final Thoughts/Questions

- Coexistence is a contractual relationship that all parties must uphold – including the predators!
  - Rangeland livestock and large carnivores rely on the same habitat (see Miller et al 2016)
  - Nonlethal should refer to both our relationship with predators and predators' relationship with livestock.
- Wildlife Services plays critical role in educating, sharing intelligence
- Is there a relationship between nonlethal tool efficacy and lethal control?
  - Do tools like stockmanship and hazing rely upon the potential for targeted lethal control actions?

Questions?



"Wait a minute! Isn't anyone here a real sheep?"