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
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

<table>
<thead>
<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>#</td>
<td>%</td>
</tr>
<tr>
<td>Death losses from predators – mature animals</td>
<td>1,103</td>
<td>1.1</td>
</tr>
<tr>
<td>Non-predator losses – mature animals</td>
<td>98,897</td>
<td>98.9</td>
</tr>
<tr>
<td>Death losses from predators – calves/lambs</td>
<td>8,178</td>
<td>5.8</td>
</tr>
<tr>
<td>Non-predator death losses – calves/lambs</td>
<td>131,822</td>
<td>94.2</td>
</tr>
</tbody>
</table>

*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

<table>
<thead>
<tr>
<th>Tool(s)</th>
<th>Beef Cattle Producers (2016) (20% used any nonlethal tool)</th>
<th>Sheep Producers (2014) (58% used any nonlethal tool)</th>
<th>Goat Producers (2014) (93% used any nonlethal tool)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Guard animals only</td>
<td>26.3</td>
<td>1. Fencing only</td>
<td>1. Other nonlethal</td>
</tr>
<tr>
<td>2. Fencing only</td>
<td>15.5</td>
<td>2. Guard dogs only</td>
<td>2. Fencing only</td>
</tr>
<tr>
<td>3. Other nonlethal</td>
<td>5.1</td>
<td>3. Fencing and Guard dogs</td>
<td>3. Guard dogs only</td>
</tr>
<tr>
<td>4. Frequent checks only</td>
<td>5.1</td>
<td>4. Night penning only</td>
<td>4. Guard dogs and Fencing</td>
</tr>
<tr>
<td>5. Guard animals and Fencing</td>
<td>4.1</td>
<td>5. Guard donkeys only</td>
<td>5. Fencing and Other nonlethal</td>
</tr>
</tbody>
</table>

*Adapted from USDA APHIS data.*
If your predator of concern is a:

<table>
<thead>
<tr>
<th>Consider these tools:</th>
<th>Dog</th>
<th>Coyote</th>
<th>Mtn Lion</th>
<th>Black Bear</th>
<th>Gray Wolf</th>
<th>Fox</th>
<th>Bobcat</th>
</tr>
</thead>
<tbody>
<tr>
<td>Livestock guardian dog</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Donkey</td>
<td>●</td>
<td>●</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>●</td>
<td>NA</td>
</tr>
<tr>
<td>Llama</td>
<td>●</td>
<td>●</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>●</td>
<td>NA</td>
</tr>
<tr>
<td>Woven-wire fencing w/ trip wire</td>
<td>●</td>
<td>●</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Permanent electric fencing</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>?</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Temporary electric fencing</td>
<td>●</td>
<td>●</td>
<td>?</td>
<td>NA</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Electro-net fencing</td>
<td>●</td>
<td>●</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Fladry or turbo fladry</td>
<td>NA</td>
<td>?</td>
<td>NA</td>
<td>NA</td>
<td>●</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Attractant (carcass) removal</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Human presence / stockmanship</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>?</td>
<td>●</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Night pen (small-scale operations)</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Shed lambing / calving / kidding</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Multi-species grazing (cattle w/ small ruminants)</td>
<td>●</td>
<td>●</td>
<td>?</td>
<td>?</td>
<td>?</td>
<td>●</td>
<td>?</td>
</tr>
</tbody>
</table>

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

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

- 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

• 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

Photo: Kencove Fencing
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)
Electro-Net Fencing

- 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)

Photo: E. Macon
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)
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

- 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

Photo: Hopland REC
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
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?”