



PREDATION MANAGEMENT WITH A FOCUS ON COYOTES

Alberta Lamb Producers

Ken Jones

Anita O'Brien /

Primary predators of sheep

- Coyote
- Gray Wolf
- Bears
 - Black & Grizzly
- Cougar
- Ravens / Magpies
- Eagles



Photo Credit: THagedorn, AARD



Expect predation to occur

- Wildlife populations (including predators) have been rebounding for decades
- Predators use the same land-base / environment as we do
- Livestock are often easier prey than wildlife
 - ▣ maximum gain for energy expended
 - ▣ sheep & lambs often preferred over cattle

Have a Predation Management Plan!

Understand the Predator

- Life cycle / biology
- Behaviour
 - ▣ Individual & species
 - ▣ Territory defense
 - ▣ Hunting / Killing



Photos source: esrd.alberta.ca

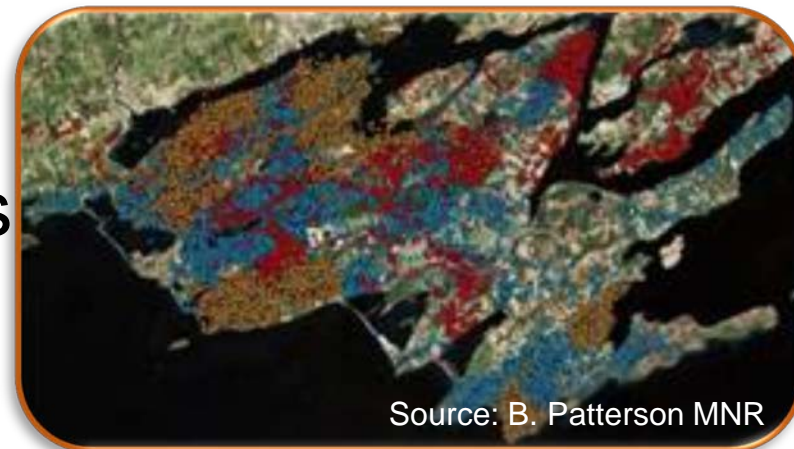
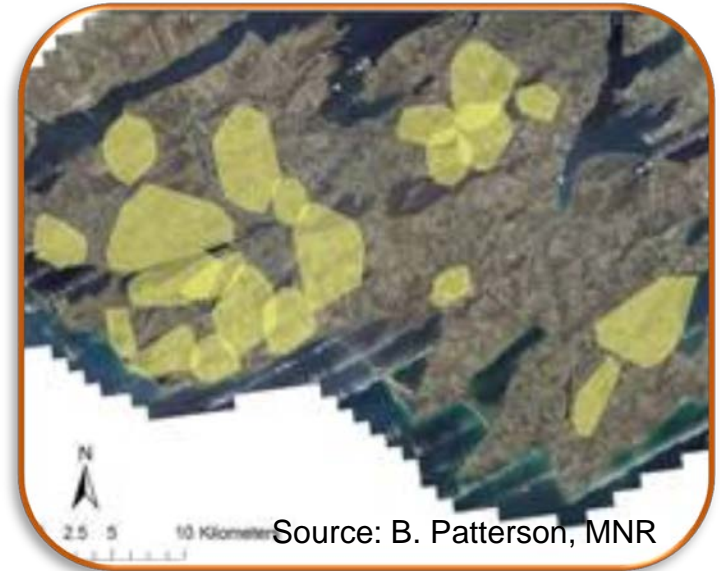
Coyotes

- Highly adaptable, readily living in most environments
- Found throughout most of Alberta
- Opportunist
 - ▣ feeding on small rodents,
 - ▣ fruit & berries,
 - ▣ small mammals, and livestock
 - ▣ readily scavenge on livestock bone yards



Coyotes

- Typical territory of 12 km²
 - ▣ varies with food abundance & terrain
 - ▣ very little overlap
- Resident coyotes = breeding pair + pups & often subadults
 - ▣ actively maintain & defend territories
- Transient coyotes = dispersed young, old or disabled coyotes
 - ▣ live “between” other territories
 - ▣ travel over larger area



Coyotes

- Adult weight: 10 – 23 kgs
 - ▣ males generally heavier than females
- Pups born in April / May after 60-63 day gestation
- Average litter size 5-7 pups
- Breeding pairs can be monogamous for life
- Both adults tend the pups and defend the den during pup rearing
- Pups disperse anytime from late fall onwards – food abundance



Coyotes as livestock predators

- Active day & night
 - ▣ most active at & just after sunset
 - ▣ Exploitation will shift to mostly night activity
- Mostly kill lambs BUT capable of killing adult sheep
- Multiple kills common with very young lambs,
 - ▣ often many carcasses with no feeding on them
- Carcasses of small lambs easily carried off with little or no physical evidence
 - ▣ rely on flock and individual ewe behaviour to indicate problem



Coyotes as livestock predators

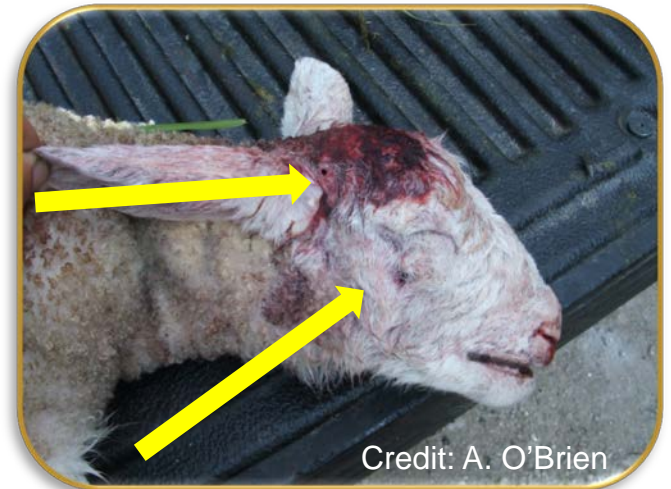
- Breeding pairs responsible for majority of predation
 - ▣ radio collars & DNA implicated the breeding male in 85% of kills (Blejwas et al, 2006)
 - ▣ removal of one or both of pair can stop predation until new pair becomes established
- Coyote pair without pups kill fewer sheep than those with pups



Coyotes as livestock predators

Common kill patterns

- Bite to throat +70% with adults and older lambs
- Bite to top of head or middle of back with smaller lambs
- Tears to flank, ribs and hips + wool pulls with young & inexperienced coyote attacks
- Kill patterns can vary between individual coyotes!!



Coyotes as livestock predators

- Prevention is key
- Expect coyotes to continually challenge your prevention methods
- Once predation starts, prevention methods usually ineffective until
 - ▣ initiate different prevention method, or
 - ▣ removal of problem predators



Predation management

- Know your flock.
- How susceptible are your sheep to predation?
- Incorporate preventative measures.
- What's your plan when predation does occur?
- Incorporate selective removal for problem predators.
- Know what programs are available.
- Know the rules.

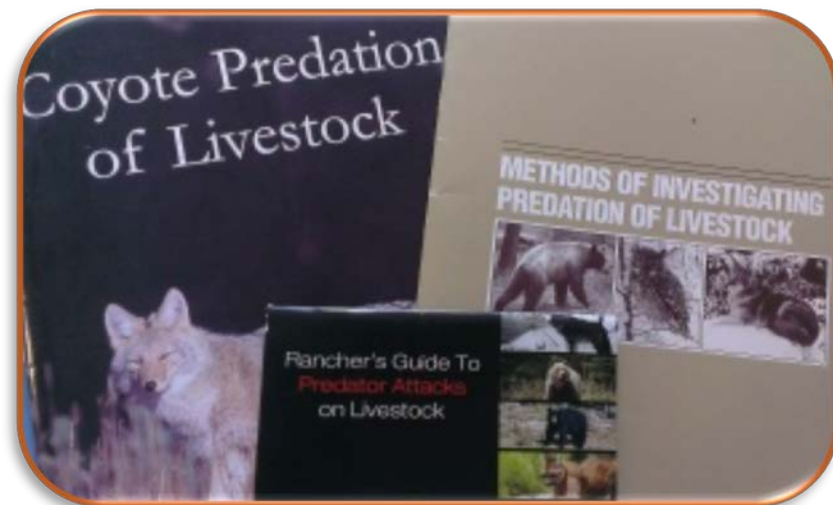
Know your flock

- Know what's Normal flock & guardian behaviour
- Indications that predators are harassing the flock, sheep are:
 - ▣ more skittish & flighty
 - ▣ more easily startled
 - ▣ more vocal than usual
 - ▣ not settling to graze (restless)
 - ▣ guardian is acting more aggressive or missing!!



How susceptible is your flock?

- Become familiar with the predator species sharing your land-base.
- What predators are causing you problems?



Take advantage of excellent resources

What groups are most susceptible?

- Grazing season & pup rearing overlap
- Lambs generally most susceptible
 - ▣ flock lambing on pasture
- Sheep that are compromised
 - ▣ weak, thin, lame
- Predation risk changes over the year
- Susceptibility changes with predator species



Credit: A. O'Brien

Incorporate Preventative Measures

- Livestock Guarding Animals
- Change Flock Management
- Deadstock Disposal
- Fencing
- Short-duration Deterrents



Livestock Guarding Animals

To be effective, livestock guardian MUST:

- stay with the sheep flock,
- be attentive and protect the flock,
- be trustworthy and not harm the flock,
- be aggressive toward the predator species you are dealing with,
- be physically sound and have good conformation as these impact longevity,
- be free from serious genetic defects (such as hip dysplasia, poor bite and entropion in dogs).

Guardian Animals

- Dogs are most effective and versatile
- Donkeys & llamas
 - ▣ effectiveness best with single group / small flocks
- Disadvantages / challenges with each
- Determine suitability for your situation

Livestock Guardian Dogs

Most common complaints / problems

- ❑ LGDs don't stay with sheep
- ❑ LGDs roam - leave the farm
- ❑ LGDs play with or maul sheep
- ❑ LGDs bite - injure sheep
- ❑ LGDs don't stop predation
- ❑ LGDs aggressive to people

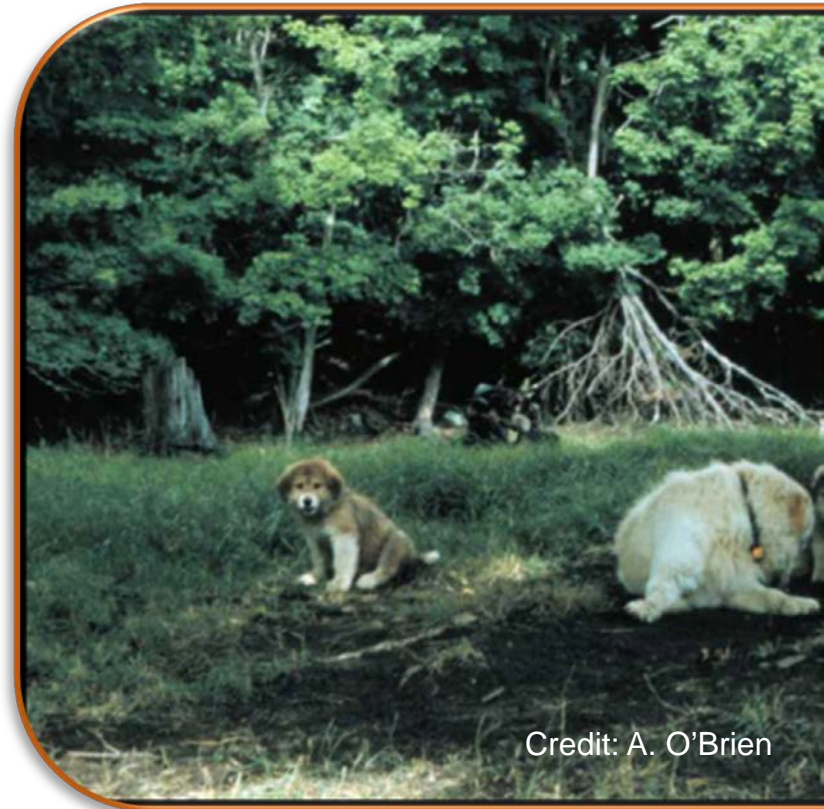


Pup rearing environment can prevent most from developing into habits!!

Critical period of social development

Primary Socialization 3 - 8 weeks

- Ears & eyes begin to work
- Notice other animals at a distance
- Begin to form primary social relationships
- Eating solid food
- Food pan dominance
- Wrestling with littermates



Credit: A. O'Brien

Critical period of social development

Early Juvenile 8 – 16 weeks

- Attachments made to other animals
- “Non-reflexive” care-soliciting behaviour starts
 - ▣ dominance-submission
 - ▣ food-begging

Key period of bonding.

By 16 weeks the “critical period” or window during which social attachments are made is



Credit: A. O'Brien

Prevent learning of problem behaviour

(during 3 to 16 weeks of age period)

- Crawling through gates, feeder panels
- Crawling over pen partitions
- Crawling under, over, through fences
- Playing with other dogs (farm dogs / pets etc.)
- Leaving the sheep for “human companionship”

Correct these behaviours promptly even in older dogs.

Improve effectiveness of LGDs by:

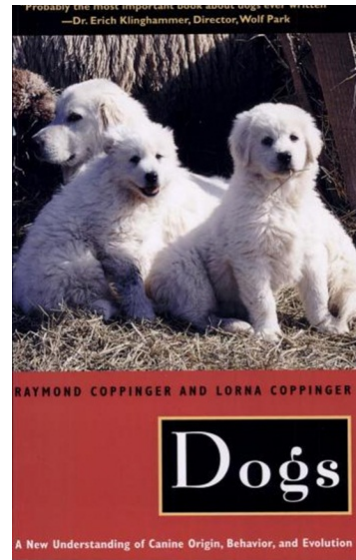
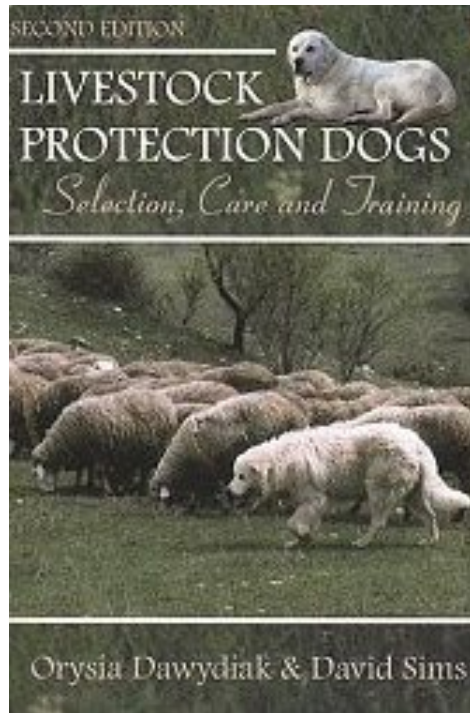
- Train to stay with sheep
 - ▣ needs to happen as pups as per last few slides
- Pair-up dogs that work well together to form good teams
- Change up dogs during heavy predation pressure
- Good fences keep dogs with sheep
- Manage health - balanced diet / control tapeworms
- Purchase from working stock from farms dealing

Don't keep dogs that don't measure

“Anita’s” ideal LGD

- Born in mid April
- Raised on pasture with lambing / nursing ewes (*pup is 2 to 16 weeks*)
 - ▣ behind excellent electric fence
 - ▣ human social interaction limited to feeding time
- Moved in with other adult dog(s) when lambs are weaned (August)
 - ▣ spend time with each adult dog during winter feeding period
 - ▣ only with adult ewes during breeding period

Good LGD resources



United States
Department of
Agriculture

Animal and
Plant Health
Inspection
Service

Agriculture
Information
Bulletin
Number 588

Livestock Guarding Dogs Protecting Sheep from Predators



Donkeys

Benefits

- ❑ Same feed as flock
- ❑ Longevity
- ❑ Cost



Problems

- ❑ Success is highly variable
- ❑ Frequent hoof care
- ❑ Most donkeys must be removed during lambing
- ❑ Less effective:
 - ❑ in large, or brush covered pastures
 - ❑ when more than one used
- ❑ Bovatec & rumensin poisonous

Llamas

Benefits

- Same feed as flock
- Longevity
- Minimal hoof care



Problems

- Success is highly variable
- Intact males can kill livestock
- Less effective:
 - ▣ in large, or brush covered pastures
 - ▣ where more than one per group is used
 - ▣ where groups grazed along same fence line
- Same internal parasites as sheep
- May need to be shorn annually

Flerds

- Bonding of cattle with sheep so they graze as a group rather than two separate groups
- Shows some effectiveness with coyote predation

Effectiveness unknown when:

- Predation is occurring on the cattle herd
- Bears or wolves are the problem predator

Coyote Deterrent Fences

Permanent High Tensile Mesh (paige) Wire Fence

Permanent High Tensile Electric Fence
ElectroNets

“A coyote's response to a fence is influenced by various factors, including: the coyote's experience and motivation for crossing the fence.”

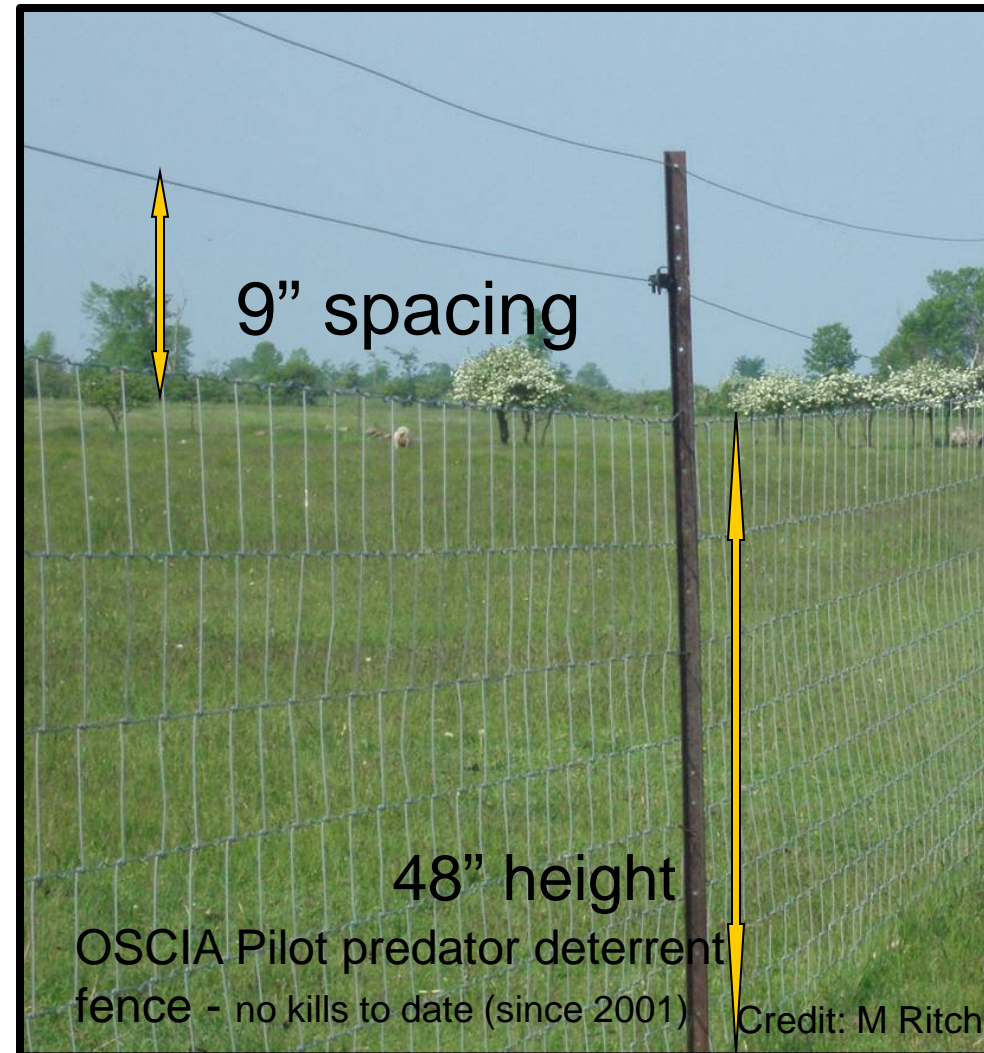
Quote from USDA Wildlife Damage Agent

Features of coyote deterrent fence

- Coyotes cannot travel through fence
- Coyotes cannot crawl under fence
- Coyotes cannot get over fence
- Coyotes cannot get through at gateways

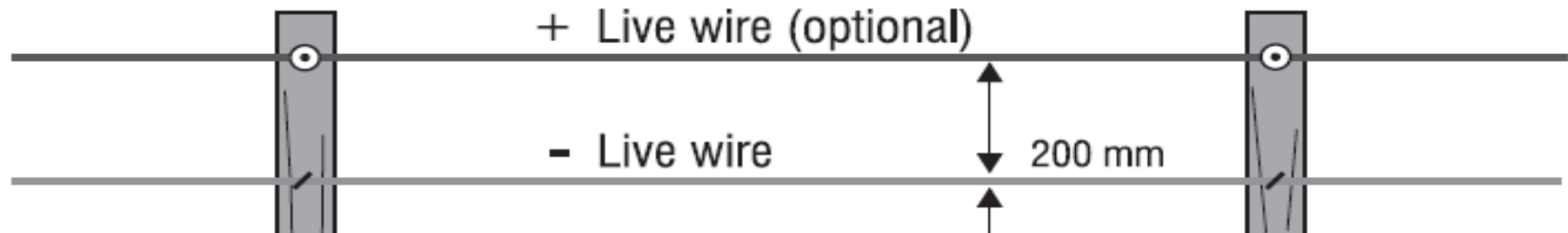
Permanent HT mesh (paige) wire fence

- Total height 5.5 feet
- HT woven wire
 - ▣ 1048-6-12.5
- + 2 HT smooth wire
 - ▣ one electric; 9" space
- Posts – 5 m (16') apart
- Cost (2001)
 - ▣ \$2.37 /ft (+63%)
- Lifespan – 25 to 40 yrs

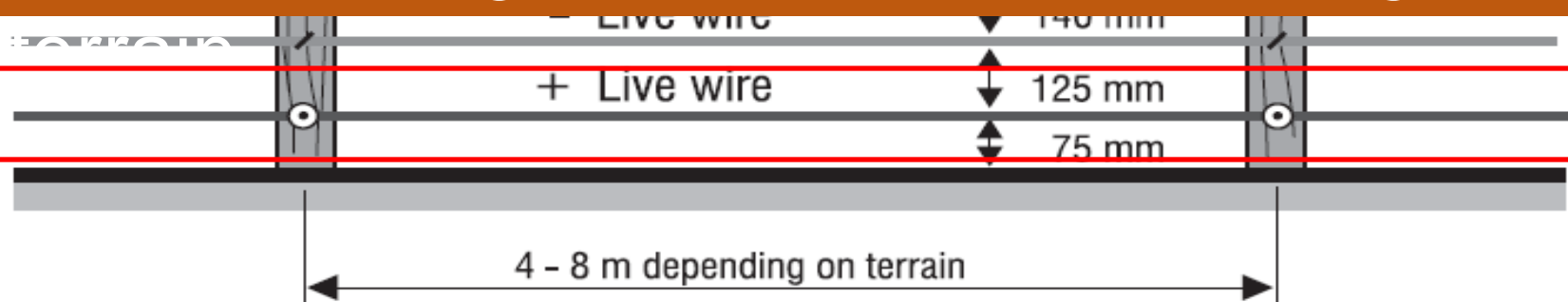


Alberta Agriculture Anti-Predator Electric Fence

from Acorn & Dorrence 1994



- Nine wire alternating charged & ground
- Bottom wire charged and 3 inches from ground
- Post spacing 4 to 8 meters depending on



Challenges with electric fences

from “*Evaluation of Anti-Coyote Electric Fences*”. Acorn & Dorrence, 1994

1. *Wires spaced too far apart*
2. *Bottom charged wire too high from ground*
3. *Inadequate vegetation control*
4. Posts too far apart
5. Uneven fence line
6. Overall height of fence & gates too low
7. No insulators on electrified wires
8. Grounding system insufficient
9. Inadequate corner braces
10. Wire tension (inadequate or too much)

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1. *Wires spaced too far apart*
 2. *Bottom charged wire too high from ground*
 3. *Inadequate vegetation control*
 4. Posts too far apart
- Biggest Challenge: is effective monitoring of electric fences to ensure they are working properly!*
6. Overall height of fence & gates too low
 7. No insulators on electrified wires
 8. Grounding system insufficient
 9. Inadequate corner braces
 10. Wire tension (inadequate or too much)

Gates as predator entry-ways

- At least as high as fence
- No openings to go through:
 - ▣ mesh wire
 - ▣ corn crib wire
- Minimal space to go under – ruts can provide access!!
 - ▣ consider height adjustment for winter use
- Keep them closed!!



If using electric HT smooth

- Vegetation needs to be kept clear from both sides of fence
- Minimum shocking power at least 4500 V
- Minimum output 6 joules (at least greater than 3 joules)
 - many farm fence energizers cannot maintain this during heavy vegetation burden on fence



Electric nets



- ✓ Can be effective
- ✓ Attractive for use on rented grazing land
- ✗ Very labour intensive
- ✗ Entanglement is a risk, visibility is critical
- ✗ High cost - \$0.97 /ft
- ✗ Lifespan 5 to 10 yrs

Change flock management

- With pasture lambing avoid spreading labour too thinly:
 - ▣ aim for short lambing season
 - ▣ 17 – 20 day breeding = 25 to 30 day lambing season
 - ▣ remove rams from ewe flock
- Daily checking of sheep flock
 - ▣ change time of checking to keep coyotes guessing
- Delay grazing of high risk pastures
 - ▣ or only graze with mature ewes
 - ▣ or strip / mob graze in smaller units

Confinement production

- Balance the cost of predation losses with the costs of confinement production
- MUST have prolific genetics (Romanov / Rideau Arcott / Outouais Arcott / Finnish Landrace)
- Flock management
 - ▣ focus shifts to high productivity & accelerated production
 - ▣ flock health – managing diseases that thrive in confinement
- Capital investment
 - ▣ buildings and machinery vs.
 - ▣ predation control, fencing and pasture watering system
- How well can you weather low lamb prices?

Confinement / Lot lambing

- Where ewes are lambed in barns / lots / corrals & turned out when lambs are 10+ days old
- Predation risk is NOT eliminated, may only be delayed
- Some producers keep ewes & lambs confined until weaning
 - ▣ lambs stay in lot, finish on stored feed
 - ▣ only ewes go to pasture
- Compare added costs to cost of predation (partial budgets)

Night confinement

- More suitable for
 - ▣ small & medium sized flocks
 - ▣ dry ewes vs ewes and lambs
- Risk of localized damage unless corral is moved frequently
- Predation can occur in night corrals
 - ▣ use same construction principals as for coyote fence: cannot go through, over, or under



Deadstock disposal

- Natural disposal
 - ▣ feeding on deadstock does not necessarily teach predators to become livestock killers ... BUT
 - ▣ can be a significant food source (especially winter) for predators thus encouraging more to stay in area
 - ▣ and becoming problem predators the following grazing season
- Consider using other disposal methods – composting, incineration, burial, rendering
 - ▣ see AARD's Ropin' the Web for good reference materials
- Prompt deadstock removal
 - ▣ ensures predators are not artificially attracted to your locale
 - ▣ helps break *Taenia ovis* / *C. ovis* parasite cycle

Short-Term Deterrents

Fladry

Sound, Light & Combinations

Scarecrows

Fladry — used in Europe to funnel wolves to hunters

- Basically flags hanging from rope erected ~ 50 cm (18 inches) from ground
- Effectiveness approx 60 days for wolves
 - minimal with coyotes
- Greatest limitations = cost & labour for maintenance
 - cost = 35 to 50% of wire cost for permanent coyote fence



Credit: K. Nixon

Sound, lights & combinations

- Effectiveness varies with type
- Sound
 - ▣ for radios – several days
 - ▣ distress calls combined with their natural predator effective especially with birds
- Light
 - ▣ Foxlights & NiteGuard – questionable effectiveness especially for daytime predation



Source: niteguard.com



Source:foxlight.co

m

Combinations of sound & light

- Phoenix Wailer (Canada)
 - used at airports & horticulture as bird deterrents
 - trialed in Ontario mid 1990s as coyote deterrents
- SMALL protection zone limits use to small & medium sized flocks OR small pastures
- Noise disturbs neighbours, dogs



Scarecrows

- Most ancient of scare devices
- Basic to mechanized
- Human scent can increase effectiveness
- Periodic moving delays habituation





Comments on short-term deterrents

- Delay habituation
- Match device effectiveness with protection time needed
- Limit their use to specific time periods
- Recognize their effective coverage limitations
- Recognize their effectiveness varies with predator species
- Don't forget cost effectiveness compared to longer term deterrents
 - Eg. cost of fladry vs cost of permanent fencing!!



What's Your Plan – When Predation Occurs?

What's your plan when predation occurs?

- Move the flock?
- ID predator species
- Find where the predator got in
- Why did your prevention method fail?
 - ▣ Can you reinforce it?
 - ▣ Do you need to change or add a new method?
- Is removal of predator warranted?



Regulations & Assistance Programs

Regulations regarding Coyote Control

Fish and Wildlife Act

Agricultural Pests Act

Wildlife Predator Compensation

Damage Control License

Coyote Predation Management Program



Regulations regarding coyote control

- Coyotes listed as a nuisance under *Agricultural Pest Act & Pest and Nuisance Control Regulations(184/2001)*
 - ▣ regulations provide options to remove problem coyotes
 - ▣ BUT are landowner's / producer's responsibility
- *Fish and Wildlife Act* Regulations allow hunting (without a license) of wolves, coyotes, black bears and cougars on privately owned land
 - ▣ by owner or occupant of that land, or
 - ▣ Alberta resident who is authorized by owner or occupant
- Or on public land
 - ▣ by a person authorized to maintain livestock on that land, or
 - ▣ Alberta resident who is authorized in writing by the livestock owner

<http://www.albertaregulations.ca/huntingregs/genregs.html#predation>



Assistance Programs

Wildlife Predator Compensation Program

- ▣ provides compensation for losses & damage by wolves, grizzly bears, black bears, cougars and eagles
- ▣ contact local Fish and Wildlife district office

Damage Control License

- ▣ provides legal authority to hunt or trap nuisance wildlife
- ▣ contact Fish and Wildlife District Office to determine whether a damage control license is required



Assistance programs

Coyote Predation Management Program

- to inform and assist landholder in managing coyote predation of their livestock
- administered through joint co-operative agreement b/n Alberta Ag (ARD) & **participating** rural municipalities
- local municipal council approves which coyote control materials and devices can be used within their jurisdiction
- authorized municipal inspectors respond to landholder complaints of coyote predation, provide advice and (where needed) direct assistance to manage coyote predation
- determine if your local municipality participates

Removal Tools

Target Problem Coyotes

Compound 1080

Shooting

Neck Snares

Trapping

M-44's

Selective removal of problem predators

- Breeding pair implicated in most sheep & lamb predation
- Removal of breeding pair
 - ▣ usually stops predation until new alpha pair is established which takes approx. 3 to 4 months when both are removed, ~ two months when one is removed



Credit: A. Whitlam



Poisons for coyote control

- Use is strictly regulated & registered as restricted pesticides under *Pest Control Products Act of Canada*
- People who use poisons under the coyote control program of ARD MUST
 - ▣ be trained in its use & safety precautions
 - ▣ demonstrate responsible use
 - ▣ agree to use the poison in strict accordance with the regulations of *Agricultural Pests Act of Alberta & the Pest Control Products Act of Canada*
- Use of poison is VERY controversial
- Use of poisons is a PRIVILEGE, not a RIGHT



Poisons –

Compound 1080 (Sodium

Monofluoroacetate)

- More selective than other poisons (eg. strychnine)
- Lethal dose for coyotes less likely to harm person or animals such as bears & wolves
- Chance of secondary poisoning is low for animals that feed on coyotes killed with 1080
- Death usually occurs within 24 hours
- Used in tablet form for single lethal dose baits (SLD baits) & carcass baiting
- Used in liquid form in livestock protection collars
- Only available through Coyote Predation Management Program



Compound 1080 in baits

- SLD Bait - single lethal dose in bite-size piece of meat such as chicken head or egg
 - ▣ is the preferred method for using 1080 in Alberta
- Carcass baiting
 - ▣ up to six (6) tablets in a fresh coyote-killed livestock carcass.
 - ▣ coyotes returning to carcass assumed to be involved in killing that sheep.
 - ▣ increases the chance of non-coyote poisonings
 - ▣ disposal of unconsumed carcass more difficult

Compound 1080 – Livestock protection collars

- The most effective at targeting coyotes that kill sheep & lambs
 - only those biting throat are removed
- Considered safest way to use poisons for coyote control
- Only available through Coyote Predation Management Program



M-44's

- ❑ Mechanical device that ejects sodium cyanide into mouth of coyote (that bites & pulls on it)
- ❑ Cyanide produces hydrogen cyanide which prevents body cells using oxygen
- ❑ Death is very quick (~ 5 minutes)
- ❑ Use authorized by Agricultural Pest Act & strictly regulated (poison)
- ❑ Use of poisons is controversial
- ❑ Only available through Coyote Predation Management Program



Source: Wildlife Services
Factsheet



Shooting

- Over freshly killed sheep
- In a pasture where predation occurred
 - ▣ both assume the returning coyote is responsible
- Using calls can increase probability of removing the ones killing
 - ▣ elicits an approach response from the alpha pair
- Alberta regulations allow landowners to take immediate action to control coyotes , wolves, black bears and cougars

Challenges:

- × Time commitment
- × Not 24/7 = missed opportunities
- × Not every producer has the experience or skill required

Neck snares

- Effectively targets problem coyotes
- Working 24/7
- Easy to learn how to use
- Inexpensive
- Use in Alberta for coyote control requires a permit
- Available through Coyote Predation Management Program
 - local Agricultural Services



Credit: A. O'Brien

Trapping

- ❑ Resident Fur Management License required if trapping yourself
- ❑ Traps must be certified to meet *Agreement on International Humane Trapping Standards (AIHTS)*.
- ❑ Work 24/7
- ❑ More expensive than snares
- ❑ Incidental catches of other wild animals
- ❑ Higher level of skill & maintenance compared to



Summary Points

- Expect predator attacks
 - ▣ predation is an ongoing risk with outdoor livestock production
- Know your predators
 - ▣ which ones share your land-base
 - ▣ basic biology & behaviour
 - ▣ killing & feeding patterns
- Evaluate & implement prevention methods
- Have a predation management plan
 - ▣ steps to take when predation occurs
 - ▣ what programs are available
 - ▣ what removal options work for you?
 - know the rules & regulations



Thank You!

To our supporters for making the development of producer resources possible...



& to Susan Hosford, AARD, for material review.



Thank You

Questions?