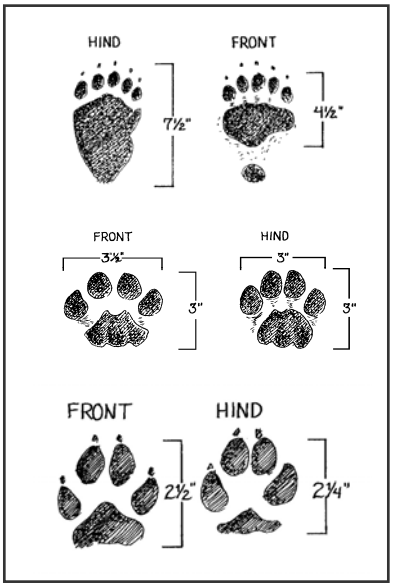
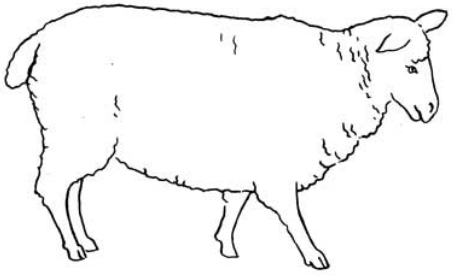
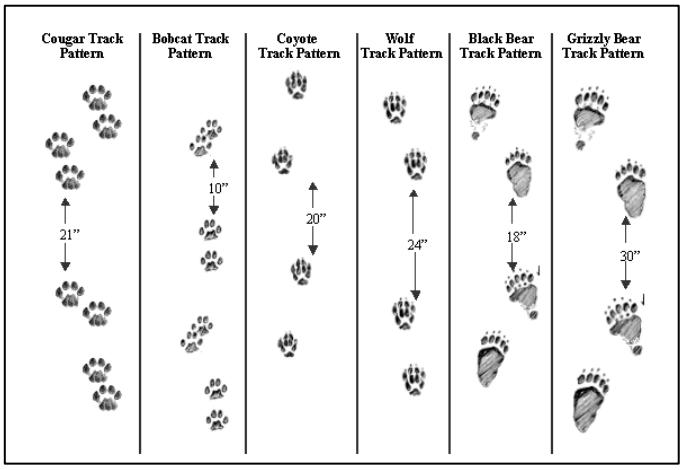
Washington Department of FISH and WILDLIFE

Procedure for Investigation of Livestock Injuries & Mortalities:

A Manual for WDFW Field Personnel







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LIVESTOCK INJURY & MORTALITY REPORT
REPORTING PARTY PHONE CALL INTERVIEW

Please remember….never refer to an incident as a "kill" or a "depredation" until a determination is made. Instead, refer to it a missing, injured, or dead animal until an investigation is completed.

What is the CODY Reference # for this case? ☐

(1) Is the animal injured, missing, or dead? Injured ☐ Missing ☐ Dead ☐

(2) Did reporting party witness what happened? Yes ☐ No ☐

(3) Were there any witness accounts of what happened? Yes ☐ No ☐

(4) When was the livestock last seen uninjured or alive? <1 Day ☐ 2 Days ☐ 3 Days ☐ 4Days+ ☐

(5) How long after finding injury or death did you call? <1 Day ☐ 2 Days ☐ 3 Days ☐ 4Days+ ☐

(6) Do you have a veterinarian that treats your animals? Yes ☐ No ☐

If yes, what is your veterinarian's name/location? ☐

(7) If dead, was the animal vaccinated and current for common infectious diseases? Yes ☐ No ☐
If yes, when ☐

(8) If dead, do you think the livestock could have died from an illness? Yes ☐ No ☐

If yes, what might the illness be? ☐

(9) Do you think the livestock injury or death is from a predator? Yes ☐ No ☐

If yes, which predator? Wolf ☐ Coyote ☐ Dog ☐ Cougar ☐ Bobcat ☐ Bear ☐ Eagle ☐

Why this predator? ☐

(10) Its imperative the entire site be undisturbed to preserve sign that will help us determine what happened. Can you restrict all human & pet activity until we get there? Yes ☐ No ☐

(11) If dead, can you cover the carcass with a tarp (& walk out the way you came in)? Yes ☐ No ☐

(12) We'll be there at approximately ☐

WDFW Personnel – you should have the following equipment necessary to perform an investigation and accurately determine its cause. Livestock Mortality Investigation Manual, knife, blade sharpener, digital camera, video camera, topographic maps, GPS unit, rubber gloves, plastic Ziploc bags, felt tipped permanent markers, measuring tape, notebook, track casts, hand wipes

*References used for this manual include:
(1) Niemeyer, Carter. 2010. Wolfer. Bottlefly Press, Boise, Idaho, USA.
(2) The Internet Center for Wildlife Damage Management. 2011. Livestock and animal predation identification. http://icwdm.org/inspection/livestock.asp
(3) AgriLife Communications. 2010. Procedures for evaluating predation on livestock and wildlife. Texas A&M University, Texas, USA.
(4) Government of Alberta. 2010. A rancher's guide to predatory attacks on livestock. ISBN: 978-0-7785-9053-8
(5) Severidt, J.A., D.J. Madden, G. Mason, F. Garry, and D. Gould. 2001. Dairy Cattle Necropsy Manual, Colorado State University, Integrated Livestock Management. Fort Collins, CO. Pg. 102.

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LIVESTOCK INJURY & MORTALITY REPORT

INJURY & MORTALITY INVESTIGATION
(PAGE 1 OF 3)

Date of Response:	Month	Day	Year

Primary Responding Official	**Agency**	**Detachment**	**Unit #**

Other Responding Officials	**Agency**	**Detachment**	**Unit #**

Location of Incident: (address)

GPS Coordinates:

Latitude:	Longitude:

Livestock Owners (s) Name:

Property Owners (s) Name:

Witness(es) Name:

Livestock species involved in Injury/Mortality	**Sex**	**Age Class**	**Young Present?**	**Other Animals Present (# and type)?**

Distance of carcass to nearest structure (in feet) ***(take photos)***	House	Barn	Road	Forest

Site description (check one) ***(take photos)***	Open / Rangeland	Brushy	Lightly Forested	Heavily Forested

Were attractants present? (bones, other carcasses, etc) Yes ☐ No ☐ Type

Comments:

LIVESTOCK INJURY & MORTALITY REPORT

INJURY & MORTALITY INVESTIGATION

Taking photographs is essential (including the overall layout of the scene as soon as you depart your vehicle). Photograph everything you can on the way to the site of the injury or mortality. Photograph areas of disturbed ground (tracks, scat, blood) along the way. Are dogs present or audible?

(1) Was this an injury or mortality? Injury ☐ Mortality ☐

(2) Did you photograph the overall site from multiple angles? Yes ☐ No ☐

(3) Did you see predator sign in the vicinity? ***(take photos)*** Yes ☐ No ☐

If yes, which kind (check all that apply) Hair ☐ Scat ☐ Tracks ☐ Sighting ☐ Other ☐

Which predator? Wolf ☐ Coyote ☐ Dog ☐ Cougar ☐ Bobcat ☐ Bear ☐ Eagle ☐

(4) Is the livestock in an enclosure? Yes ☐ No ☐

If yes, what kind of enclosure ***(take photos)***? Wood Cattle-Fence ☐ Wood Post & Rail ☐
Barbed -Wire ☐ Non-Barbed Wire ☐ Welded-Wire ☐ PVC ☐ Aluminum ☐

If welded wire, what are the size of the openings? 2 in ☐ 4in ☐ 6in ☐ 8+in ☐

How tall is the fence? ***(take photos)*** 2 ft ☐ 3ft ☐ 4ft ☐ 5ft ☐ 6ft ☐ 7+ft ☐

What are the posts made of? ***(take photos)*** Wood ☐ Steel ☐ Aluminum ☐ PVC ☐

Was there any type of roof on the enclosure? ***(take photos)*** Yes ☐ No ☐

What are the dimensions of the pen/pasture? ***(take photos)*** _____

Was any part of the fence electrified? Yes ☐ No ☐

Was any part of the fence damaged (i.e. holes/ tree damage)? ***(take photos)*** Yes ☐ No ☐

If yes, explain _____

(5) Was the animal tethered or movement confined in any way? Yes ☐ No ☐

(6) What is the estimated size or weight of the animal (lbs)? _____

(7) Where are injuries to the livestock? (check all that apply) ***(take photos)*** Left Hip ☐ Right Hip ☐
Back ☐ Left Shoulder ☐ Right Shoulder ☐ Neck ☐ Head ☐
Flank ☐ Front left leg ☐ Front right leg ☐ Rear left leg ☐ Rear right leg ☐ Groin ☐ Tail ☐

(8) Could the animal have been structurally injured (barbed wire, fence post, fencing, barn corner, etc)?
Yes ☐ No ☐ Explain _____

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LIVESTOCK INJURY & MORTALITY REPORT

INJURY & MORTALITY INVESTIGATION

(9) Describe the body condition of the animal?

Are the hips, spinal processes, and ribs easily visible? Yes ☐ No ☐

Is the hair in poor condition (matted, missing, ectoparasites)? Yes ☐ No ☐

If yes, explain

Any obvious abnormalities (bone breaks, lesions, abscesses, cavity discharge)? Yes ☐ No ☐

If yes, explain

(10) Are there any signs of a struggle such as trampled grass, broken fences, blood trails, evidence of arterial bleeding by spurting-blood spots, etc? ***(take photos)*** Yes ☐ No ☐

If yes, explain**:**

(11) If this is a mortality, has the carcass been moved in any way? ***(take photos)*** Yes ☐ No ☐

If yes, explain**:**

(12) If this is a mortality, is the carcass dismembered in any way? ***(take photos)*** Yes ☐ No ☐

If yes, explain**:**

(13) If this is a mortality, does the carcass exhibit rigor mortis? Yes ☐ No ☐

(14) If this is a mortality, is the carcass bloated? ***(take photos)*** Yes ☐ No ☐

(15) Were punctures on the animal's hide observed? (bullet, bites, claws)***(take photos)*** Yes ☐ No ☐

If yes, where are they (check all that apply)?

Back ☐ Left Shoulder ☐ Right Shoulder ☐ Neck ☐ Head ☐ Flank ☐

Front left leg ☐ Front right leg ☐ Rear left leg ☐ Rear right leg ☐ Groin ☐ Tail ☐

(16) Was there a lightning storm in the area near the time of death or injury? Yes ☐ No ☐

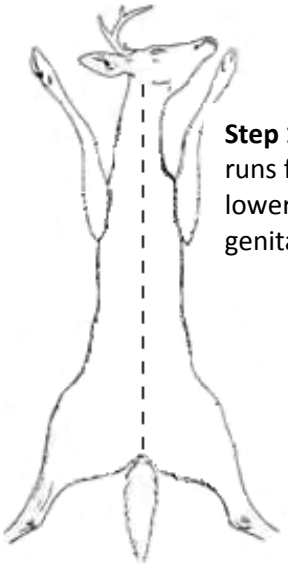
Comments:

LIVESTOCK INJURY & MORTALITY REPORT

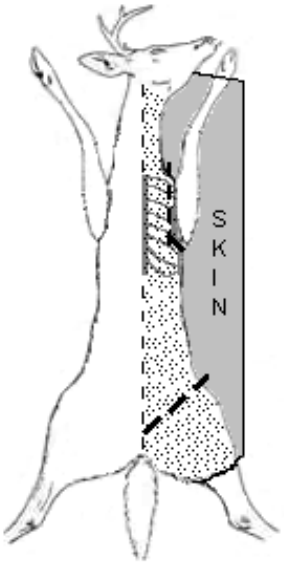
DETERMINING CAUSE OF DEATH
(PAGE 1 OF 2)

Determining Cause of Death (Mandatory Procedure) ***(see photograph on following page)***

Necropsy procedure for mortalities: Once the animal is skinned similar to the diagram below, continue with the questions below to determine cause of death as (1) predation or (2) not predation.



Step 1. Initial cut runs from the lower jaw to the genitals



Step 2. Skin half of the animal and lay the hide back to expose underlying muscles

Step 3. Repeat the process on the second half

Step 4. Remember from training, we are looking for the appearance of hemorrhaging (resembling grape jelly) that would indicate trauma to areas while the animal was alive. ***NOTE: Redness is not trauma due to predation, its post-mortem tissue degeneration***

(17) After skinning, is there evidence of predator bite marks under the hide? Yes ☐ No ☐

(18)After skinning, was any hemorrhaging (resembling grape jelly) observed? ***(take photos)***
Yes ☐ No ☐

If yes, where was the hemorrhaging (check all that apply)? Back ☐ Left Shoulder ☐
Right Shoulder ☐ Neck ☐ Head ☐ Flank ☐ Front left leg ☐ Front right leg ☐
Rear left leg ☐ Rear right leg ☐ Groin ☐ Tail ☐

If you answered "No" to questions 17 & 18 above, evidence would suggest this mortality is NOT due to predation.

If you answered "No" to questions 17 & 18 but see predator sign, evidence would suggest a scavenging event.

(19) Do you suspect a scavenging at the site of the carcass?
** SEE THE SCAVENGING PAGE BELOW FOR DETAILS*

If yes, which predator? Wolf ☐ Coyote ☐ Dog ☐ Cougar ☐ Bobcat ☐ Bear ☐ Eagle ☐

(20) Is there evidence on the hide or the carcass of an entry and/or exit wound characteristic of a bullet or arrow in the muscle tissue of the animal? Yes ☐ No ☐

Comments:

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LIVESTOCK INJURY & MORTALITY REPORT

DETERMINING CAUSE OF DEATH

Below are 3 pictures of a classic predation by a wolf that can be used for field investigations. Notice the attack zones that are common to all wolf predations including the armpits, the groin, and the rear of the animal by (Photos by Carter Niemeyer)

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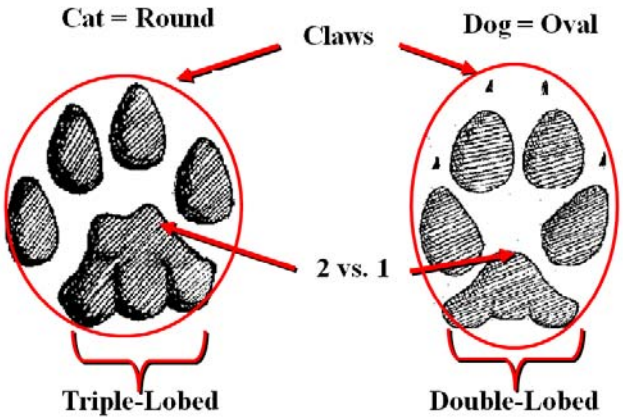
LIVESTOCK INJURY & MORTALITY REPORT

DISTINGUISHING TRACKS OF PREDATORS

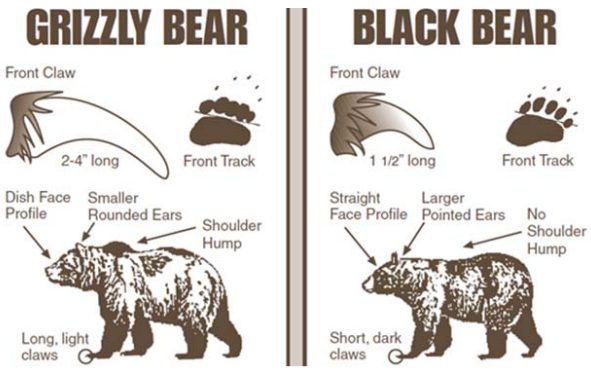
SPECIES ID - FELID VS. CANID



SPECIES ID - FELID VS. CANID

SPECIES ID – DOG vs COYOTE vs WOLF

SPECIES ID – GRIZZLY vs BLACK BEAR



Claws and toe alignment are key ID characters

LIVESTOCK INJURY & MORTALITY REPORT

SCAVENGING, INJURY & OTHER CONSIDERATIONS

Scavenging Considerations

Did the Feeding Occur Before or After? Wolves, coyotes, dogs, cougars, bobcats, and bears all take advantage of scavenging opportunities	
Evidence of Scavenging	**Evidence of Predation**
There may be no blood on the ground around the carcass, or blood may have drained on to the ground from body openings such as the mouth or nose. But after skinning, no hemorrhaging (resembling grape jelly) is <u>not</u> observed	There may be blood on the ground around the body, or in other areas, indicating the animal bled when attacked. There may also be a blood trail. But after skinning, hemorrhaging (resembling grape jelly) <u>will almost always</u> be apparent
Lacerations and puncture wounds found on the hide's exterior <u>do not</u> show corresponding signs of hemorrhaging (resembling grape jelly) on the interior of the hide or on adjacent tissue after skinning.	Lacerations and puncture wounds found on the hide's exterior <u>will show</u> corresponding signs of hemorrhaging (resembling grape jelly) on the interior of the hide or on adjacent tissue after skinning. Blood may also drain from puncture wounds.
Tracks may be observed around the animal. Cannot be used for determination.	Tracks may be observed around the animal. Cannot be used for determination.

.Injury Considerations

Use caution: Generally, predators don't inflict an injury in an area like this on a horse because risk of injury is high; this was a structural injury in an enclosure

Although this lamb's nose suggests predation, it was post mortem feeding by birds

Use caution: this lamb was killed by liver damage caused by trampling in an enclosure

Other Considerations

Causes of death to livestock are too numerous to mention. However, consider the following in your investigations of predation. Also consider rustling in cases of missing livestock.

- Vehicle strikes
- Gunshots
- Disease
- Lightning
- Stillbirth
- Old Age
- Prolapse (organs protruding from the rectum or vagina)
- Poisonous Plants
- Ingestion of Foreign Objects

LIVESTOCK INJURY & MORTALITY REPORT

INVESTIGATION RESULTS & CLASSIFICATION

WDFW Criteria for Classification of Reported Predation Incidents

(Adapted from Wildlife Service's Form 200)

Confirmed Predation – A predation is confirmed when there is reasonable physical evidence that an animal was attacked and/or killed by a predator. Most importantly, there must be presence of bite marks and hemorrhaging (grape jelly) indicating that the attack occurred while the prey was still alive.

In instances where the prey has been consumed, and predation is suspected, predation could still be confirmed *IF* there is enough evidence such as blood sprayed or spilled at the attack site, evidence of a struggle, remains of other livestock where there is still sufficient evidence to confirm predation.

Probable Predation – a predation is probable when evidence suggests predation, but lacks sufficient evidence to clearly confirm predation by a particular species. Evidence suggesting probable predation include known predator activity in the area which is confirmed by using telemetry on radiocollared predators, or recently confirmed predation in the same or nearby area. All of these factors, and possibly others, should be considered in the investigators best professional judgment

Unknown – an incident is classified as unknown when it lacks sufficient evidence to classify it as either a confirmed or probable predation. This classification is appropriate if it is unclear what the cause of death may have been. The investigator may or may not have much of a carcass remaining for inspection, or the carcass is deteriorated to the point of not being useful for investigation. Unconfirmed predations may still show signs of scavenging by predators, which does not warrant removal or payment.

Not Predation – Cause of death is something other than predation. Other causes include vehicle strike, disease, gunshot, lightning, stillborn, prolapsed, old age, eating poisonous plants, eating foreign materials, and others. Unconfirmed predations may still show signs of scavenging by predators, which does not warrant removal or payment.

After reviewing all of the provided information and completing the investigation, what is the classification being assigned to this incident?

Confirmed Predation ☐ **Probable Predation** ☐ **Unknown** ☐ **Not Predation** ☐

Justification:

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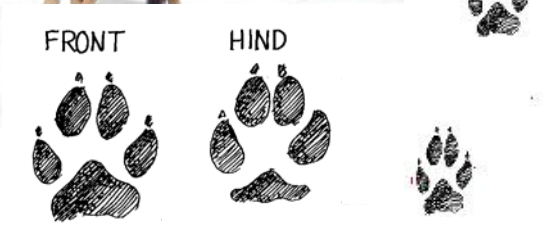
LIVESTOCK INJURY & MORTALITY REPORT

PREDATOR "SIGNATURES"

WOLF



36"

Track Dimensions
4" wide by 5" long
(length = claws to heel pad)

Domestic prey:
- Cattle (focus on calves & yearlings)
- Sheep
- Aggressive domestic dogs / guard dogs

Hunting strategy: Coursing predator
- Group hunter (except lone, dispersing individuals)
- Generally uses open habitats to hunt
- Potential for prolonged chase and attack
- Kills rarely moved from attack location

Common attack zones: Rear half
- Groin area
- Behind and under front leg
- Hindquarter s
- Tail

Hemorrhaging (grape jelly) on an inverted hide shows hemorrhaging. Evidence of bite marks is also visible

Notice the stripped tail, hemorrhaging in the hind quarters, and the damage under and behind the front legs

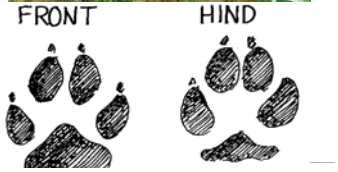
Attack characteristics: Maiming
- Extensive biting and hemorrhaging
- Bites and trauma concentrated on or near hindquarters
- Bites and trauma under or behind the front legs
- Ragged or frayed wounds and lacerations
- Extensive blood loss

Feeding characteristics: Messy
- Feeding across the carcass, often initiated at rear
- Prey may be consumed rapidly
- Crushed bones
- Multiple feeding activity centers and prey remains spread across site

LIVESTOCK INJURY & MORTALITY REPORT

PREDATOR "SIGNATURES"

COYOTE

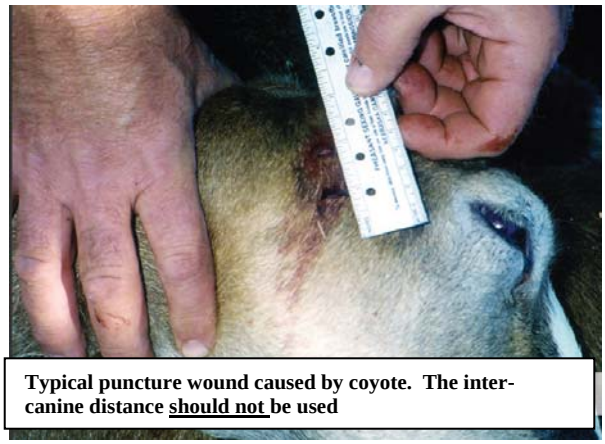


Track Dimensions
2 ½ " wide by 2 ½ " long
(length = claws to heel pad)

Domestic prey:
- Sheep
- Goats
- Fowl
- Domestic pets
- Newborn calves

Hunting strategy: Coursing predator
- Individual or group hunter
- Hunts across a wide variety of habitats
- Potential for prolonged chase and attack
- Kills rarely moved from attack location

Common attack zones: Neck, Rear
- Jugular/neck (common on sheep)
- Hindquarter/groin
- Flank
- Tail
- Behind and under front leg



Typical puncture wound caused by coyote. The inter-canine distance <u>should not</u> be used

Puncture marks are smaller and lacerations are narrower than a wolf, coyote, or bear would leave

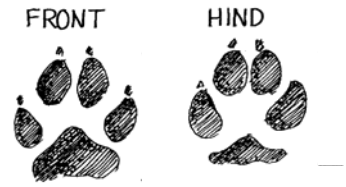
Attack characteristics: Maiming
- Extensive biting and hemorrhaging
- Bites and lacerations on or near hindquarters and tail
- Widespread trauma reflecting repositioning during attack
- Crushed windpipe may be present
- Trauma may be present under or behind the front legs

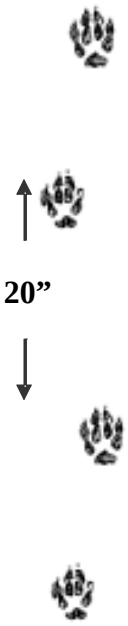
Feeding characteristics: Messy
- Feeding across the carcass, often initiated at rear
- Multiple feeding activity centers
- Chewed legs, tail, or head
- Prey remains spread across the site

LIVESTOCK INJURY & MORTALITY REPORT

PREDATOR "SIGNATURES"

DOG





Track Dimensions (varies)
3 ½" wide by 3 ½" long
(length = claws to heel pad)

Domestic prey:
- Sheep
- Goats
- Fowl
- Domestic pets
- Newborn calves

Hunting strategy: Coursing predator
- Individual or group hunter
- Hunts across a wide variety of habitats
- Potential for prolonged chase and attack
- Kills rarely moved from attack location and may not even be fed on

Common attack zones: Rear half
- Hindquarter/groin
- Flank
- Tail

Typical dog attack showing multiple injuries but little feeding

Dogs are rarely experienced enough to kill efficiently

Attack characteristics: Maiming
- Extensive biting and hemorrhaging
- Bites and lacerations on or near hindquarters and tail
- Ragged or frayed wounds and lacerations
- Widespread trauma reflecting repositioning during attack
- Trauma may be present under or behind the front legs

Feeding characteristics: Messy
- Feeding across the carcass, often initiated at rear
- Multiple feeding activity centers
- Chewed legs, tail, or head
- Prey remains spread across the site

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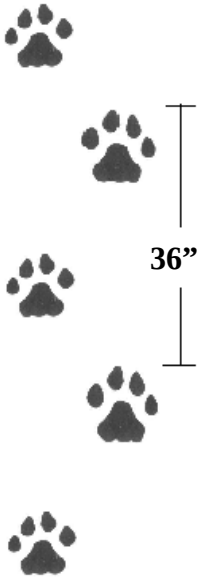
LIVESTOCK INJURY & MORTALITY REPORT

PREDATOR "SIGNATURES"

COUGAR

FRONT HIND

Track Dimensions
4 ½" wide by 4" long
(length = claws to heel pad)



Domestic prey:

- Goats
- Sheep
- Llamas and alpacas
- Fowl
- Domestic pets

Hunting strategy: Stalking predator

- Individual hunter (except a female with yearlings)
- Requires cover (e.g., understory vegetation, topography, trees)
- Attacks occur over a limited distance with little or no chase
- Kills may be drug or carried considerable distance

Common attack zones: Front half

- Neck
- Throat
- Head
- Shoulder

Canine punctures on throat (may not be this obvious)

Typical felid "cache" where remains are neatly covered up with debris

Cougars feed in a predictable pattern. The organs are part of the first feeding

Attack characteristics: Clean, efficient

- Crushed neck, windpipe, skull, (occasionally the rostrum)
- Punctures and lacerations to neck, head,
- Knife-like wounds and lacerations with very clean edges (all claws may not register)
- Limited repositioning during attack
- Caching of kill

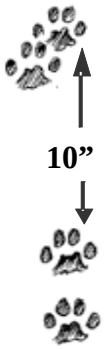
Feeding characteristics: Efficient, tidy

- Hair is removed by sheering or plucking
- Entry behind shoulder or just behind ribs
- Internal organs consumed 1st (heart, liver, lungs)
- Muscle tissue consumed secondarily
- Feeding activity and prey remains concentrated at a single location

LIVESTOCK INJURY & MORTALITY REPORT

PREDATOR "SIGNATURES"

BOBCAT



Track Dimensions
2 ½" wide by 2 ½" long

Domestic prey:

- Goats
- Sheep
- Fowl
- Domestic pets

Hunting strategy: Stalking predator

- Individual hunter (except a female with yearlings)
- Requires cover (e.g., understory vegetation, topography, trees)
- Attacks occur over a limited distance with little or no chase
- Small prey may be drug or carried away from the attack location

Common attack zones: Front half

- Neck
- Throat
- Head
- Shoulder

The scratching below to cover up a carcass (cache behavior) is typical of bobcats and cougars. Size will dictate which feline it is

Bobcat (and cougar) feeding pattern; chest is opened cleanly, hair is plucked clean from hide, and organs are exposed and eaten first

Attack characteristics: Clean, efficient

- Crushed neck, windpipe, skull, or rostrum with associated trauma
- Knife-like wounds and lacerations with very clean edges (all claws may not register)
- Limited repositioning during attack
- Caching of kill

Feeding characteristics: Efficient, tidy

- Hair is removed by sheering or plucking
- Entry behind shoulder or just behind ribs
- Internal organs consumed 1st (heart, liver, lungs)
- Muscle tissue consumed secondarily
- Limited crushing of bones
- Feeding activity and prey remains concentrated at a single location

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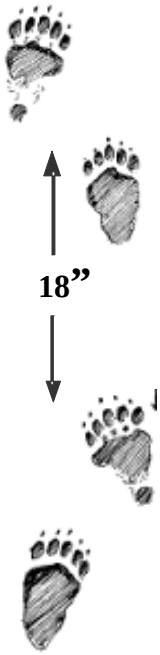
LIVESTOCK INJURY & MORTALITY REPORT

PREDATOR "SIGNATURES"

BLACK BEAR



Track Dimensions
Front - 5" wide by 4" long
Hind – 6" wide by 8" long

Domestic prey:

- Goats
- Sheep
- Calves

Hunting strategy: Ambush predator

- Individual hunter (except a female with yearlings)
- Hunts across a variety of habitats
- Chases typically occur over short distances
- Kills may be moved or carried away from the attack location

Common attack zones: The back

- Back/spine
- Neck
- Skull
- Withers

Notice the tissue hemorrhaging in the withers area

Notice the tissue hemorrhaging and feeding pattern on back

Attack characteristics: Blunt force

- Bites to the top of the prey along spine
- Lacerations from claws to the chest and shoulders
- Wounds and lacerations will be ragged or frayed
- Skull or rostrum may be crushed

Feeding characteristics: Messy

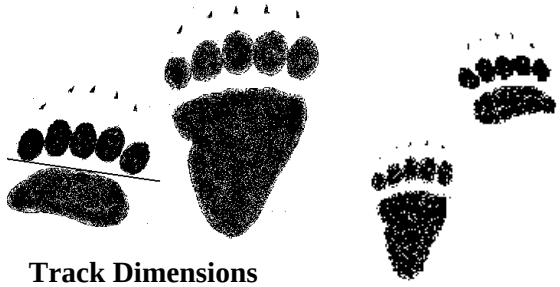
- Feeding across the carcass
- Extensive crushing of bone
- Carcass turned inside-out
- Consumption of utters and other soft tissues
- Carcass may be torn, mauled, or mutilated

Washington Department of FISH and WILDLIFE

LIVESTOCK INJURY & MORTALITY REPORT

PREDATOR "SIGNATURES"

GRIZZLY BEAR



36"

Track Dimensions
Front - 5" wide by 7" long
Hind – 6" wide by 11" long

Domestic prey:

- Goats
- Sheep
- Calves

Hunting strategy: Ambush predator

- Individual hunter (except a female with yearlings)
- Hunts across a variety of habitats
- Chases typically occur over short distances
- Kills may be moved or carried away from the attack location

Common attack zones: The back

- Back/spine
- Neck
- Skull
- Withers

Notice the tissue hemorrhaging in the withers area

Notice the tissue hemorrhaging and feeding pattern on back

Attack characteristics: Blunt force

- Bites to the top of the prey along spine
- Lacerations from claws to the chest and shoulders
- Wounds and lacerations will be ragged or frayed
- Skull or rostrum may be crushed

Feeding characteristics: Messy

- Feeding across the carcass
- Extensive crushing of bone
- Carcass turned inside-out
- Consumption of utters and other soft tissues
- Carcass may be torn, mauled, or mutilated

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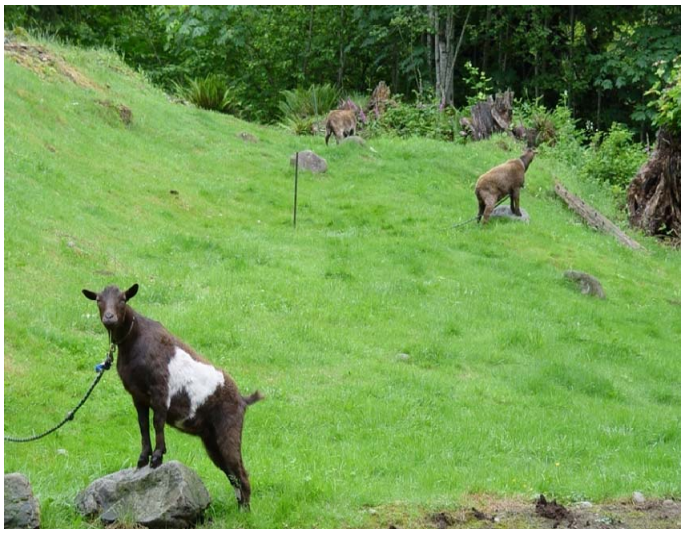
LIVESTOCK INJURY & MORTALITY REPORT

HUSBANDRY ADVICE

The photos below illustrate some of the best ways to avoid conflict/predation. Notice that they are all PREVENTATIVE techniques which is essential to sharing a landscape with predators



Tethering goats and sheep and/or not boarding them at night is an open invitation for predation and should be avoided

Bone-yards and leaving dead animal carcasses exposed can attract predators and encourage them to occupy a site

Attracting ungulates by intentionally or unintentionally feeding (with landscape plants, hay or feed) them and tolerating them becoming habituated to should not be tolerated to avoid attracting predators

Wolves are here to stay in Washington. Vigilance by range riders is an effective technique to deter predation and will likely become more common in the coming years (photo by Defenders of Wildlife)

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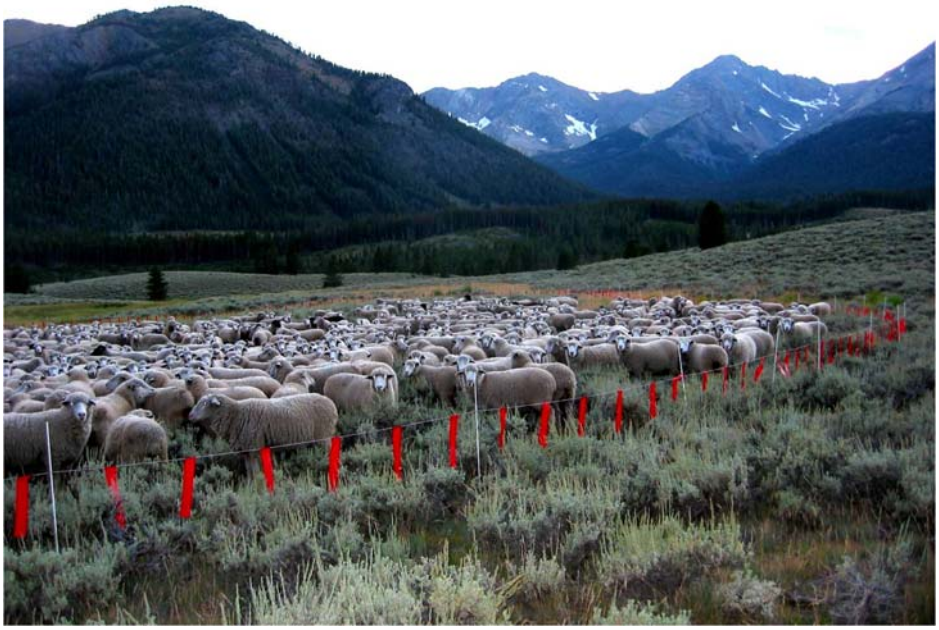
LIVESTOCK INJURY & MORTALITY REPORT

HUSBANDRY ADVICE

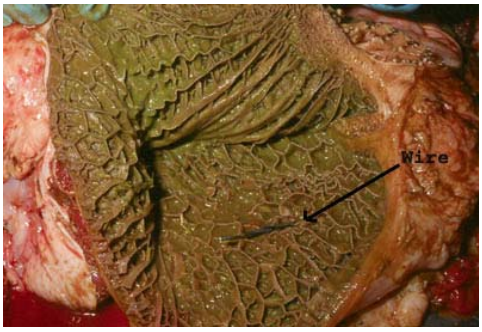


Simple fladry (above) and turbo-fladry (below, electrified) are proven methods to deter wolf predation. However, neither is meant to be used year-round. It is ideal during calving and for overnight containment of range livestock. A single person can carry and install ½ mile of fencing in a less than 2 hours. (Photos by Carter Niemeyer)

LIVESTOCK INJURY & MORTALITY REPORT

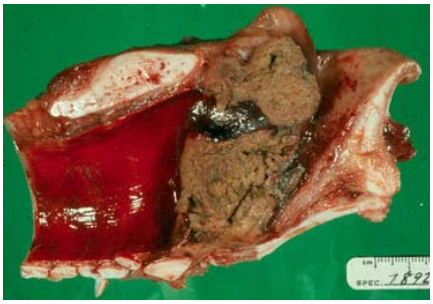
DISEASE SIGNATURES

The following "disease signatures" are for informational purposes only. Non-veterinary WDFW staff are not expected to diagnose livestock diseases. If a livestock disease is suspected, the livestock producer should be advised to consult with his or her veterinarian.



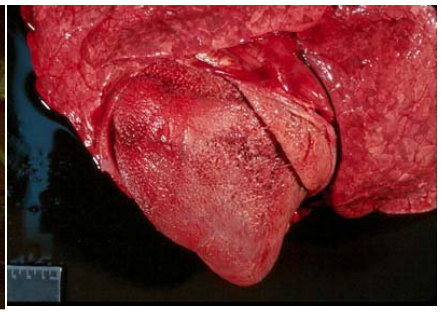
Look for any foreign material in any part of the fore-stomach, such as this wire found in the reticulum.

The photos above illustrate necrosis (dead tissue) of the larynx extending into the trachea. You may also see ulcers in this area

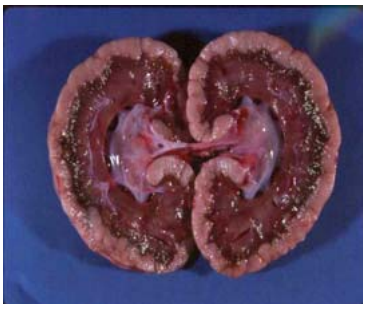


The above photos show foreign material or feed material that is caught in the esophagus (left photo) or the larynx. You may see some food material in the esophagus as well as the larynx and trachea due to death. Be sure to look closely at the surrounding tissue. If it looks red and inflamed or contains ulcers, it is likely that the food material was there prior to death

Lesions of the intestine can cause death. The blotches are blood clots



In the photos above, the heart sac has been opened and you can see that the heart is surrounded by fibrous material. This material is due to infection within the heart sac. This can be referred to as a "shaggy heart". The right photo is a more mild form of an infection within the heart sac. Notice that the heart (surrounded by lung) does not have the smooth appearance of a normal heart.



Kidney lesions. Notice how the outer layer of the kidney (cortex) looks thin and pale compared to the inner layer (medulla).

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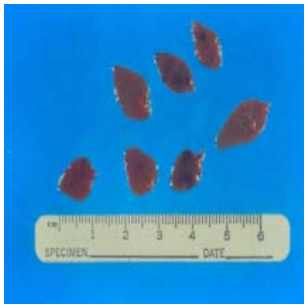
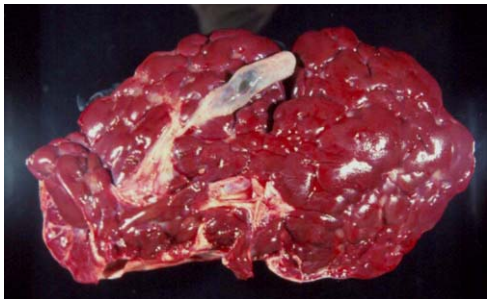
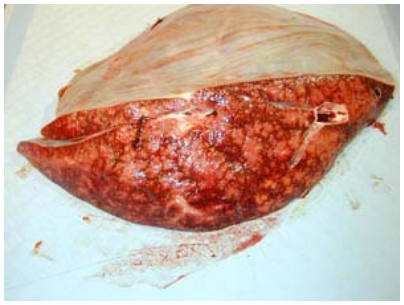
LIVESTOCK INJURY & MORTALITY REPORT

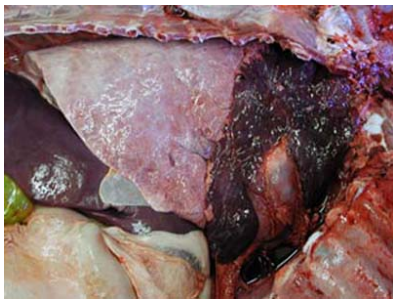
DISEASE SIGNATURES



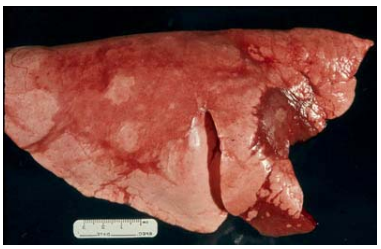


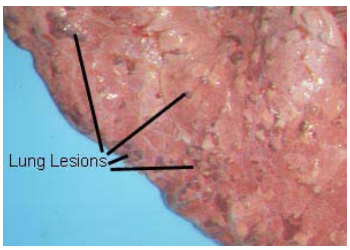


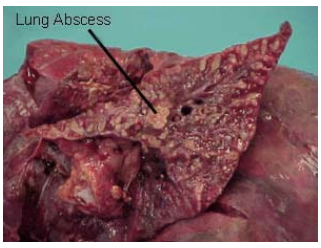
The left photo is an example of liver flukes. These travel through the liver causing damage to the liver. You may be able to see their tracts. These are usually seen in animals living in marshy areas that have snails. In the middle photo notice how the liver looks lobated like a kidney. This is due to scaring or fibrosis from a chronic disease. In the right photo the liver has a "nutmeg" appearance. White areas surrounded by red areas. This may be seen in congested livers associated with heart failure



The 2 left photos depict bronchopneumonia. Notice how the bottom-front of the lung is darker than the rest of the lung. Usually this part of the lung will be heavier than the more normal, pink lung to the left. The right photo is an example of chronic pneumonia. Notice how the lung looks darker (or redder) than normal pink lung tissue. This lung may be heavier than normal lung and will not have the "spongy" feel to it.







The left photo shows pneumonia in the lung. The red areas are the most affected and there may be some collapse of the lung in these areas. The middle photo is an example of pulmonary (lung) emphysema. When pinched, this lung will "pop" like bubble-wrap. Air has accumulated in areas where there is normally only tissue. The right photo is an example of a lung abscess. Be sure to cut into lesions such as this. An abscess will have a liquid to "cottage cheese" like appearance in the middle. A tumor or other growth will usually be harder in the middle