

Identifying predators involved in livestock loss

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Photo Courtesy of Carlton Ward Jr.

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Livestock loss in Florida

Loss
Cattle (> 500 lbs) = 30,000; predation = 1,410
Calves (< 500 lbs) = 35,000; predation = 9,020

Value
Cattle = \$48.5 million; predation = \$2.3 million
Calves = \$20.5 million; predation = \$5.3 million

Percent of operations
Cattle = 28.9%; predation = 4.9%
Calves = 26.8%; predation = 9.6%

Percent of inventory
Cattle = 2.3%; predation = 0.1%
Calves = 4.4%; predation = 1.1%

USDA
National Animal Health Monitoring System
December 2017

Death Loss in U.S. Cattle and Calves Due to Predator and Nonpredator Causes, 2015

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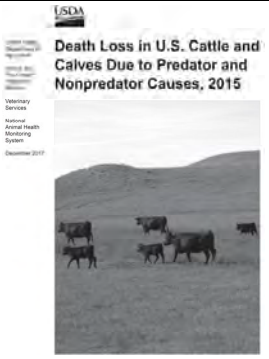
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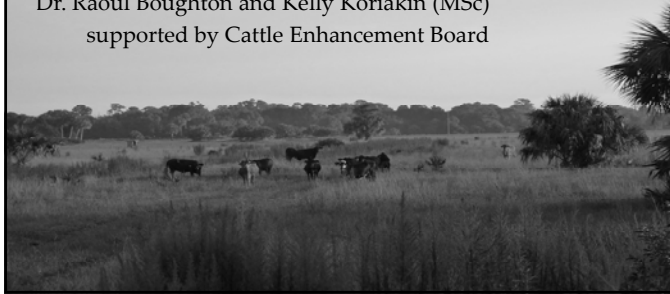
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Livestock Loss Study 2016-2019

Dr. Raoul Boughton and Kelly Koriakin (MSc)
 supported by Cattle Enhancement Board



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Livestock Loss Study 2016-2019

Calf loss rate = 13%

Major causes:
 dystocia, mineral imbalances, bacterial infections, poor cow health (often multiple issues involved)

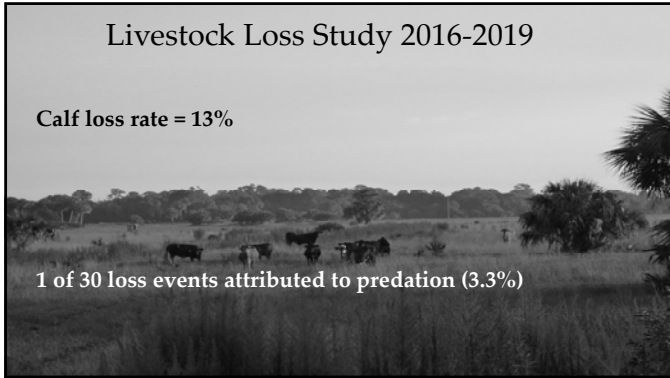


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Livestock Loss Study 2016-2019

Calf loss rate = 13%

1 of 30 loss events attributed to predation (3.3%)



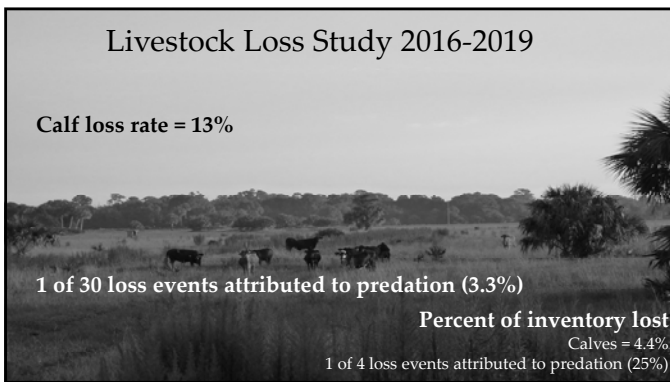
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Livestock Loss Study 2016-2019

Calf loss rate = 13%

1 of 30 loss events attributed to predation (3.3%)


Percent of inventory lost
Calves = 4.4%
1 of 4 loss events attributed to predation (25%)



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Why predator identification is important

- 1) Rule out other causes of death
 - a) Bacterial infections
 - b) Birthing difficulties
 - c) Viral infections



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Why predator identification is important

- 2) Predator-specific management
 - a) Removal efforts
 - b) Reducing risk
 - c) USDA Livestock Indemnity Program and Florida Panther Compensation Program



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Why predator identification is important

- 3) Improving overall knowledge on the state of livestock predation in Florida
 - a) Sharing information with researchers
 - b) Sharing information with neighbors

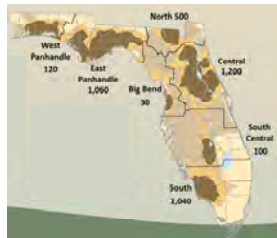
Site Investigation for Livestock Mortality or Injury

Date found: _____ Date of investigation: _____
 Observer name: _____ Landowner/Ranch Name: _____
 Contact address, phone, email: _____
 Incident GPS coordinates -> Latitude: _____ Longitude: _____
 Summarize event (including when found, which was present, likely predator species if known): _____

Signs of struggle: Trampled vegetation Blood on ground or nearby Other: _____
 Check all observed: Spill marks Feared pasture Cow hammock Pine fallwood Other: _____
 Type of habitat: Open pasture Fenced pasture Oak hammock Pine fallwood Other: _____
 Notes: _____

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Potential culprits of livestock loss



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Potential culprits of livestock loss

Photo: Tim Donawick/FWC Photo: Flickr/Christian Gommers Photo: Dan McCullough Photo: George Agreanidin

Photo: Neil Edwards

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Potential culprits of livestock loss

Photo: Tim Donawick/FWC Photo: Flickr/Christian Gommers Photo: Dan McCullough Photo: George Agreanidin

Photo: Neil Edwards

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Systematic Field Investigation

Key Goals:

1. Was predation the cause of death?
2. If so, what predator species was involved?

Photo by J. Korn/ FWC

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Systematic Field Investigation

Critical for success:

1. Minimize length of time between death and site investigation
2. Collect multiple lines of evidence



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Systematic Field Investigation

Where do these multiple lines of evidence come from:

General area around site

- habitat
- signs of struggle or pursuit
- drag marks, cached
- animal tracks
- animal scat

Carcass

- species
- adult or juvenile
- what parts consumed
- general appearance
- injuries sustained
- bite marks
- hemorrhaging

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Some general safety considerations

Displacing some predators can be dangerous

FL panther and black bear

Make noise, stay alert, work with another person

The post-mortem health status of an animal is unknown

Wear latex/nitrile gloves during carcass handling, tissue collection

Mask and eye protection can also help minimize exposure to parasites and bacteria

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Sampling kit

Essentials		Wish List
Camera	Mask	Vernier caliper
Pen and paper	Disposable scalpels	Coin envelopes w/silica desiccant for hair samples
Tape measure <i>(at least 6ft)</i>	Knife for skinning	Ziplock bags for samples
Ruler	Buckets	Cooler and ice packs to protect samples
GPS		Blood kit
Tweezers		DNA swab kit
Latex gloves		

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Five phases of investigation

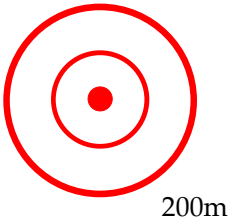
1. Initial overview of carcass site and its surrounding area
2. Focus on carcass and immediate carcass site
3. Investigate carcass for signs of hemorrhaging
4. Summarize all evidence and their interrelatedness
5. Event classification and strength of evidence

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1. Initial overview of carcass site and its surrounding areas

Avoid the temptation of going immediately to the carcass.

Attempt to visualize what may have happened from a distance
Use the archery ring approach



200m

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1. Initial overview of carcass site and its surrounding areas

Characterize the habitat around the site (forested, field, edge, near wetland, near fence or other barriers)



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1. Initial overview of carcass site and its surrounding areas

Try to determine the prey's path to where it died

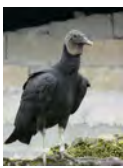
Could an ambush or chase occur here (predators have different hunting strategies)



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1. Initial overview of carcass site and its surrounding areas

Note presence and activity of scavenging birds



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1. Initial overview of carcass site and its surrounding areas

Look for sign
 Hair
 Tracks (size, pattern, stride)
 Scat
 Claw marks

Photo: Tim Damschery/WAC Photo: Rick/Creative Commons Photo: Dan McCullough Photo: George Agardian

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Physical evidence of predator presence

Tracks
 Time sensitive
 Measure and photograph
 Include reference in the image
 (ideally ruler/measuring tape)

Photo: Dan McCullough Photo: Tim Damschery/WAC

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Physical evidence of predator presence

Three major types:

Photo: Rick/Creative Commons Photo: Dan McCullough Photo: Tim Damschery/WAC

Black bear
 3 ¼ – 5 ½
 x 5 – 6 ½

Ursid Canid Felid

Graphics by Heather Griffin, USFWS

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Physical evidence of predator presence

Black bear





Photo: Mike/Creator Commons



Front
 3 1/4-5 1/2 in. x
 5-6 1/2 in.
 8.3-14.0 cm x
 12.7-16.5 cm

Hind
 3 1/4-5 1/2 in. x 6-7 3/4 in.
 8.3-14.0 cm x 15.2-19.7 cm

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Physical evidence of predator presence

Coyote vs Domestic Dog


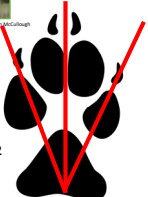


Photo: Dog & Collar



1 1/2 x 2 1/2

Coyote


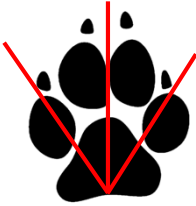


Photo: George Agapantidis



variable
 1 3/4 x 3 1/4

Domestic Dog

Graphics by Heather Griffith, LP/PAS

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Physical evidence of predator presence

Coyote vs Domestic Dog



Photo: David G. Galt




Photo: George Agapantidis



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Physical evidence of predator presence

Florida panther vs bobcat

4 1/4 x 4

1 1/2 x 1 3/8

Florida panther

Bobcat

Graphics by Heather Griffin, UF/IFAS

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Physical evidence of predator presence

Florida panther vs bobcat

bobcat tracks

cougar tracks

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Physical evidence of predator presence

Other tracks

Photo: Neil Edwards

Front Track




Hind Track

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Physical evidence of predator presence

Scat (size, shape, and texture)
 Take photographs
 Measure length and diameter
 prior to collecting

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Physical evidence of predator presence

Scat (size, shape, and texture)







	Bobcat	Florida Panther	Black Bear	Coyote	Domestic Dog
Description	Broken cords with short tails		Thick cords with blunt ends	Thick occasionally folded cords with pointed tail	
Scat diameter	½ – 1 inches	1 – 1 ½ inches	1 – 2 ½ inches	½ – 1 ¼ inches	~ 1 inches

Where they deposit them

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Physical evidence of predator presence

Scat (size, shape, and texture)

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Physical evidence of predator presence
 Scratch marks are left by Florida panther, bobcat, and black bear
 Look for them on trees near the site or cache

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1. Initial overview of carcass site and its surrounding areas

Look for signs of struggle
 ambush vs pursuit

Look for blood
 blue light is helpful

Look for drag trails

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2. Focus on carcass and immediate carcass site

Reaching carcass quickly is critical

Decomposition complicates investigations and eliminates evidence

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2. Focus on carcass and immediate carcass site

Scavenging also eliminates evidence

Scavenging can produce signs and evidence that is misinterpreted as predation



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2. Focus on carcass and immediate carcass site

Condition at time of death
There can be both immediate and gradual causes of death at play



Figure 27. Neonates that have breathed will have spongy, light-pink lungs.

Figure 30. Near full-term male deer fetuses from a doe that died of malnutrition. Stillborn neonates will look similar in that they will not be licked clean.

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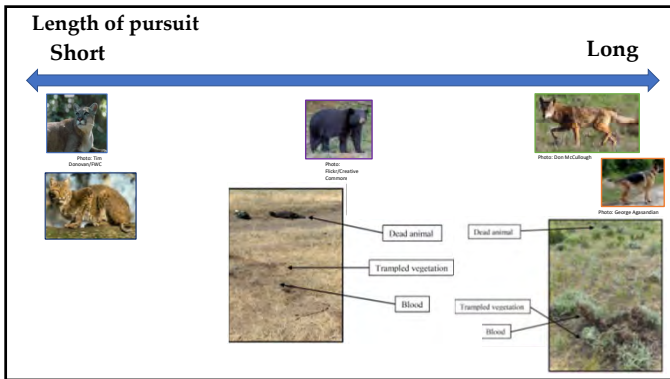
Qualitative characteristics of kill sites

Tidy

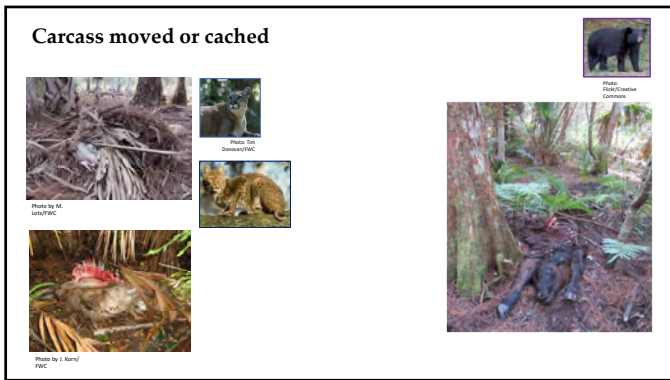
Messy



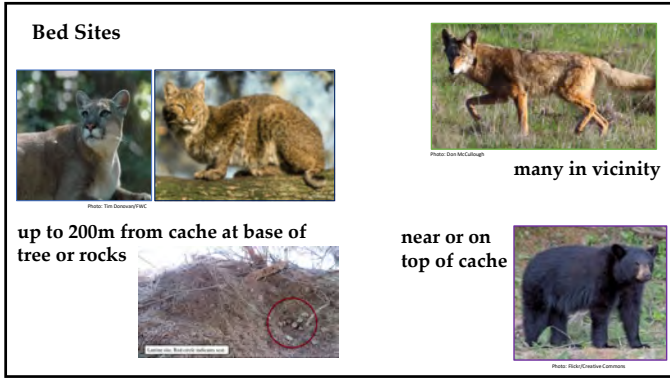
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Where was the animal attacked

Panther, Bobcat




Photo: Tim Donnan/WVC

Bear




Photo: Black/Charles Comstock

Coyote, Domestic Dog


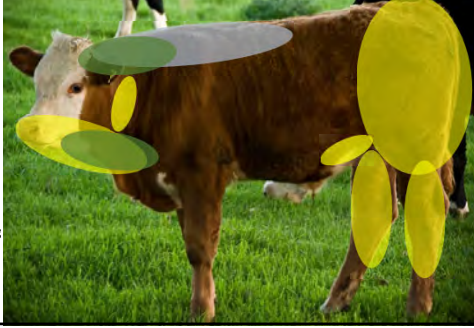


Photo: Dan McCullough Photo: George Agard/istock



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Claw marks on the carcass



Photo: Tim Donnan/WVC



Photo: George Agard/istock





Photo: Black/Charles Comstock

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Initial feeding pattern





Photo by Walt McCraw/WVC

through rib cage, behind shoulder, or lower abdomen






Photo: Black/Charles Comstock

usually abdomen, but can be variable

abdomen, hindquarters, can be everywhere if multiple individuals




Photo: Dan McCullough





Photo: George Agard/istock



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Rumen/Intestine

Not consumed

Sometimes portions consumed

Consumed and strewn around

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Additional feeding and carcass handling clues

Plucked hair

'Banana peel' hide

Inside of hide licked clean

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3. Investigate carcass for hemorrhaging

Hemorrhaging occurs from injury and can only occur when the animal is alive

Blood resulting from bleeding from the muscle is usually found between muscle and skin

Swelling around puncture holes indicates hemorrhaging - area may be discolored

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3. Investigate carcass for hemorrhaging

Be careful about lividity

When blood settles at a low point in the carcass due to gravity



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3. Investigate carcass for hemorrhaging

Canine measurements of bite wounds

fresh hides will stretch and shrink as it dries

multiple bite wounds can occur in the same area

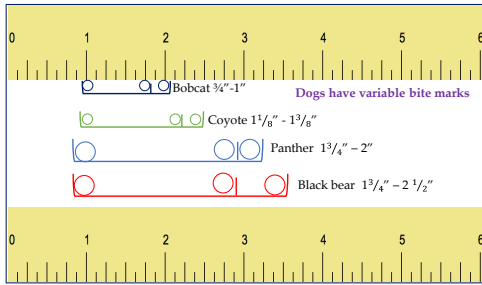
Take pictures with reference in image and record measurements



Photo by M. Lutz/PWC

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3. Investigate carcass for hemorrhaging



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3. Aspirated blood

Blood found in the nose, mouth, or trachea

This indicates an injury that allowed blood to enter respiratory system during a prolonged pursuit or struggle



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4. Summarizing all evidence

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- animal scat

Carcass

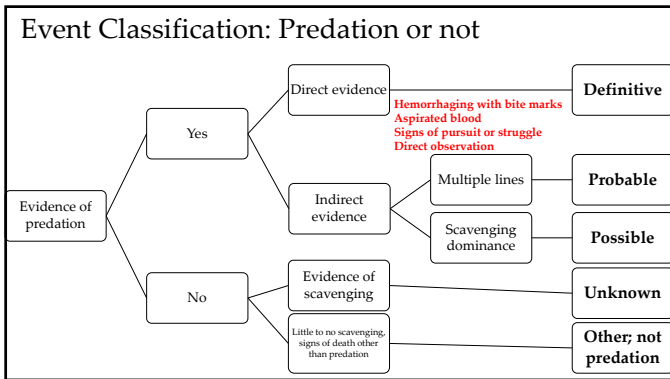
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Determining weight of evidence

What is the majority of evidence telling you?
How confident are you in your conclusion?

**Definitive, probable,
possible, unknown**

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Acknowledgments

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Questions?

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