



IN REPLY REFER TO:

United States Department of the Interior

FISH AND WILDLIFE SERVICE

Office of Law Enforcement
Clark R. Bavin
National Fish and Wildlife Forensics Laboratory
1490 East Main Street
Ashland, Oregon 97520

FWS/LE LAB CASE #12-000180

13 August 2012

(b) (6), (b) (7)(C) SA/LE

U.S. Fish and Wildlife Service
Office of Law Enforcement
515 West First Street, Room 228
Duluth, MN 55802

Dear Agent (b) (6), (b) (7)(C) :

Enclosed is the final examination report regarding the evidence submitted to the Laboratory under Agency Case No. 2012303126.

Radiographs and photographic enlargements are available upon request for courtroom proceedings. The evidence is being returned to you under separate cover.

The Laboratory policy states that we provide reports only to the investigating agent/officer. Please distribute copies of this report to the appropriate persons.

If I can be of further assistance, please give me a call at 541-482-4191 or 541-488-6505 (voice mail).

Sincerely,

Tabitha C. Viner, DVM DACVP
Supervisory Veterinary Pathologist
E-mail Address: Tabitha_Viner@fws.gov



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Office of Law Enforcement

Clark R. Bavin

National Fish and Wildlife Forensics Laboratory

1490 East Main Street

Ashland, Oregon 97520

August 10, 2012

VETERINARY PATHOLOGY EXAMINATION FINAL REPORT

Lab Case #: 12-000180

Agency Case #: 2012303126

Pathologist: Tabitha C. Viner

Case Title: Armstrong Lake Lynx Mortality

Submitting Agency:

USFWS/LE, Duluth

515 West First Street, Room 228

Duluth, MN 55802

Investigator: (b) (6), (b) (7)(C)

Suspect(s):

EVIDENCE RECEIVED

The following evidence was received in the Evidence Unit of the Laboratory on June 21, 2012, and was transferred to the undersigned examiner on June 25, 2012:

LAB-1: "One (1) Canada Lynx" [ST#732854; Item#1]

HISTORY

None.

EXAMINATION/S CONDUCTED

LAB- 1: The carcass was radiographed (x-rayed), dissected, and examined visually (necropsy examination) for gross pathological lesions. Photographs were taken to document any significant gross pathological findings.

LAB- 1 was itemized and the following sub-items were generated:

LAB-1A Fibers from haircoat of LAB-1 (not analyzed)

LAB-1B Liver from LAB-1 (not analyzed)

LAB-1C Stomach contents from LAB-1

LAB-1D Formalin-fixed tissues from LAB-1

LAB-1C was assigned to Mark A. Kirms, Senior Forensic Scientist - Chemistry, for analysis. (See report dated July 12, 2012)

LAB-1D was processed routinely and the resultant slides were reviewed by the undersigned pathologist.

Pathologist Initials

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Page 1 of 4

CASE SUMMARY

This Canada lynx had wounds and hair loss around the rear leg consistent with damage done by a snare-type trap. Wounds on the leg had chronic-active characteristics, meaning that the damaging item (suspected snare) had been present on the leg and causing constant damage to the soft tissues for many days. In my opinion, this was directly related to the dehydration and severe loss of body fat and muscle exhibited by the animal at post-mortem examination. If the trap remained fixed to an object or the ground, hunting and other movement would have been prohibited. The remains of a bird were present in the stomach, indicating that the lynx had eaten in the past 24-48 hours. This may have been made possible by a reduction in movement restriction, or may have been an opportunistic and fortunate take.

Microscopically, there was evidence of disseminated intravascular coagulation (DIC), an often terminal event characterized by excessive and widespread clotting of the blood leading to poor circulation, shock and death. DIC can be precipitated by numerous conditions and is not specific for any one disease. In the case of this lynx, I believe that DIC developed in conjunction with widespread vessel wall degeneration as a result of entrapment and emaciation.

The right foreleg had been fractured at least several weeks prior to death and was stable at the time of necropsy. This healed fracture likely had no impact on the animal's health immediately prior to death. No organophosphates, carbamates, or strychnine was detected in the stomach contents (see Chemistry Examination Report of Kirms dated July 12, 2012).

EVIDENCE DETAILS -- LAB- 1:

Common name:	Canada lynx	Weight:	5.8 kg
Scientific name:	<i>Lynx canadensis</i>	Carcass composition:	Intact carcass
Sex:	Female	Nutritional condition:	Poor
Lifestage:	Adult	Post mortem preservation:	Good
Date(s) examined:	25 June 2012		

POST MORTEM FINDINGS

RADIOGRAPHIC EXAMINATION: The lung fields are clear and the costal cartilages are mineralized. Serosal definition in the abdominal cavity is poor. Multifocally, there is gas distention of the intestines and the stomach contains heterogeneous material. The right radius is fractured approximately 4.5 cm from the carpus. The distal segment is displaced caudally and laterally and bony proliferation surrounds the fracture. The distal articulation of the right ulna is fractured and the proximal fragment is displaced laterally. Bony proliferation also surrounds this area.

EXTERNAL EXAMINATION: Examination of the hair coat with an alternate light source while wearing red glasses reveals many fibers and particulate material over the entire body that fluoresces most intensely at 570 nm. The hair around the mouth and nose and on the bottoms of all four feet fluoresces at 530 nm and 485 nm.

The eyes are markedly sunken in the head and the corneas are opaque. There are pasty black feces around the anus. Muscle mass is reduced and the bones of the spine, ribs, and hips are easily palpated through the skin. The first upper right incisor is absent.

EVIDENCE OF INJURY: On the inner aspect of the right leg just below the stifle there is a 30 x 15 mm

Pathologist Initials TV

ulceration in the skin. Hair surrounding the ulceration is matted. In a band surrounding the entire leg at the level of the ulceration, hair is shortened and thinned and there is a palpable, linear depression in the skin and subcutaneous tissues. Subjacent to the area of hair loss and ulceration around the right leg, on the cranial aspect of the tibia and fibula, there is a proliferation of white connective tissue. Bruising is present on the inner surface of the muscles covering the tibia and fibula.

INTERNAL EXAMINATION: Subcutaneous and body cavity fat stores are markedly depleted, and the musculature is atrophied. Soft tissues are tacky. There is negative pressure in the chest cavity. Bilaterally, the inner halves of the adrenal cortices are dark red. The thickness of the adrenal cortices and the medullae are each approximately 1.5 mm. Bilaterally, there are vague streaks of pallor in the renal medullae. The urinary bladder contains approximately 10 mL of normal urine. The gallbladder contains approximately 3 mL of watery, red-tinged bile. The lungs are multifocally and moderately congested. The stomach contains 93 g of soft tissues, feathers, and two eyes from a bird. In the wall of the stomach are two nodules that are 18 x 15 x 10 mm and 24 x 14 x 8 mm. Cut section of the nodules reveals gray fibrous connective tissue surrounding pockets of pink, threadlike nematodes. Within the intestinal tract are larger nematodes that are up to 6 cm long and 2 mm in diameter. Scant digesta is present in the proximal small intestine and small amounts of thick, black digesta are present in the ileum and colon. The uterus and ovaries are quiescent. The following tissues are within normal limits: thyroid glands, parathyroid glands, liver, tongue, spleen, pancreas, cecum, trachea, esophagus, heart, and brain.

Cytologic preparations of the feces, spleen, and bone marrow are evaluated. In the feces slide, there is a pleomorphic population of bacteria and debris with occasional nuclear material. Slides of the spleen and bone marrow show naked nuclei with occasional intact cells and scattered bacteria. No parasites are seen.

MICROSCOPIC EXAMINATION:

HEART: There is widespread freeze artifact causing fracturing of the myofiber bundles and flooding of spaces with homogenous, eosinophilic material. Multifocally, arterioles exhibit fibrinoid necrosis. A cellular infiltrate (possibly neutrophilic) is present within the fibrotic tissue of a papillary muscle in the left ventricle, and multifocal, moderately sized aggregates are present at the base of the papillary muscle.
BRAIN (CEREBRUM, CEREBELLUM): Multifocally, few arterioles contain brightly eosinophilic, fibrillar aggregates (fibrin thrombi). Endothelial cell nuclei are often plump.

SPLEEN: Many small arterioles exhibit fibrinoid necrosis. Smudgy fibrin deposition is present multifocally in the capsule and trabeculae. The spleen is contracted with marked undulation of the capsule.

KIDNEY: Essentially every glomerulus exhibits some fibrinoid necrosis of capillary loops. Fibrinoid necrosis is common in the renal papilla and hyaline material often replaces the interstitium in focally extensive areas. Macrovesicular fat deposits are common within renal tubular epithelium. There is scattered mineralization of tubular epithelium and lumens, and arteriolar walls. No birefringence is noted. Several linear scars characterized by close apposition of glomeruli, loss of tubules, and fibrosis of the interstitium are present and extend from the capsule into the medulla. Small cellular infiltrates are often present in the subcapsular areas of these scars.

ADRENAL GLAND: The surrounding adipose tissue is markedly depleted. There is hyaline material deposition at the corticomedullary interface. Occasionally, clusters of cortical cells contain large, clear vacuoles.

LIVER: There is marked Ito cell hyperplasia and widespread freeze artifact. Focally a fibrinoid aggregate with entrapped neutrophils is attached to the capsule.

LUNG: There is diffuse flooding of the air spaces with homogenous, eosinophilic material.

SUMMARY OF GROSS AND MICROSCOPIC FINDINGS

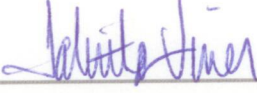
Emaciation
Skin ulcer and band of hair thinning, right hind leg
Healed fracture of right foreleg
Gastric parasites in nodules (likely *Cylicospirura felineus*)
Intestinal nematodes (likely *Toxascaris* sp.)
Fibrinoid necrosis of small vessels, disseminated
Disseminated intravascular coagulation (DIC)
Chronic renal scarring

PROXIMATE CAUSE OF DEATH

TRAUMA-TRAP LEG HOLD/SNARE SUSPECT

DISPOSITION OF EVIDENCE:

All evidence item(s) were transferred to the Evidence Unit pending return to the submitting agency.



Tabitha C. Viner, DVM DACVP
Supervisory Veterinary Pathologist

10 Aug 2012

Date

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United States Department of the Interior

FISH AND WILDLIFE SERVICE

Office of Law Enforcement

Clark R. Bavin

National Fish and Wildlife Forensics Laboratory

1490 East Main Street

Ashland, Oregon 97520

July 12, 2012

CHEMISTRY EXAMINATION REPORT

Agency:

USFWS/LE, Duluth
515 West First Street, Room 228
Federal Building
Duluth, MN 55802

Lab Case #: 12-000180**Examiner:** Kirms**Agency Case #:** 2012303126**Investigator:** (b) (6), (b) (7) (C)**Suspects:****Case Title:** Armstrong Lake Lynx
Mortality**EVIDENCE RECEIVED:**

The following evidence was transferred to the undersigned examiner on June 28, 2012:

LAB-1C: Stomach contents from LAB-1

EXAMINATION CONDUCTED:

LAB-1C: The evidence item was analyzed for the presence of carbamates employing high performance liquid chromatography and for the presence of organophosphates employing gas chromatography and gas chromatography/mass spectrometry. Additionally, the evidence item was analyzed for the presence of *Strychnine* employing gas chromatography.

EXAMINATION CONCLUSIONS:

LAB-1C: Results from the analyses conducted did not reveal the presence of any carbamates, organophosphates, or *Strychnine*.

DISPOSITION OF EVIDENCE:

The evidence item was transferred to the Evidence Unit pending return to the submitting agency.

Mark A. Kirms
Senior Forensic Scientist