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Smithsonian Institution

Office of General Counsel

VIA ELECTRONIC MAIL

October 31, 2019

Re: Your Request for Smithsonian Records (request number 49512)

This responds to your request, dated October 2, 2017, and received in this Office on October 6, 2017, for "a copy of each autopsy/necropsy report at the National Zoological Park during the time period February 1, 2017 to October 1, 2017."

The Smithsonian responds to requests for records in accordance with Smithsonian Directive 807 – Requests for Smithsonian Institution Information (SD 807) and applies a presumption of disclosure when processing such requests. The policy is posted on our website at http://www.si.edu/OGC/Records-Requests.

Enclosed are 342 pages of material. Please be advised that personal information, such as names of third parties, have been redacted consistent with SD 807 under Exemption 6, where disclosure of such information would constitute a clearly unwarranted invasion of the personal privacy of a third party with no overriding public interest.

This concludes the Smithsonian's response to your request.

Sincerely,

Jessica Sanet
Assistant General Counsel

Enclosures

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You have the right to appeal a partial or full denial of your request. Your appeal must be in writing, addressed to the Smithsonian Institution Office of General Counsel at the address below, and made within sixty days from the date of this response letter. Your letter must explain your reason(s) for the appeal. The Smithsonian Under Secretary for Finance and Administration will decide your appeal and will respond to you in writing. You also have the right to seek dispute resolution services from the Office of Government Information Services, within the National Archives and Records Administration.

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Pathology Module - Final Pathology Report
NATIONAL ZOOLOGICAL PARK

PATH # N2017-0020

Death Date: 1/31/2017
Necropsy Date: 2/1/2017

TRAGULUS NAPU (no subsp)
Greater Malayan chevrotain
Name: Brandon

Gender: Male
Age: 4Y 0M 2D
Chip: 012*360*629

Accession No.: 115129
Birth: 29 Jan 2013
Acquired: 16 Oct 2014
Removed: 31 Jan 2017

On loan from NEW YORK ZOOLOGICAL PARK, BRONX

SEX: Male | AGE: 4Y 0M 2D | WEIGHT: 2.61 kg | STAY: > 30 Days

MANNER OF DEATH: Found Dead
TIME OF DEATH: 21::30
DEATH LOCATION: WHS
SUBMITTOR: KLH
OWNER/ANIMAL DEPT: DOM - SMH

INTERVAL: 6-24 hours
XRAYED: False
DISPOSITION: INCINERATE
PROSECTOR: Cartoceti

HISTORY AND CLINCICAL OBSERVATIONS:

KEEPER OBSERVATIONS: On By

CLINICIAN OBSERVATIONS: On 2/2/2017 By KLH

1/20: presented with mild chemosis and purulent discharge along ventral right eyelid. Treated with topical solutions, meloxicam, and long acting ceftiofur.

1/25: examined for large abscess below right eye, and severe conjunctivitis, corneal edema and corneal ulcerations. abscess was flushed, eye was treated with subconjunctival antibiotics, and was able to place a tarsorrhaphy on 1/26 in effort to preserve eye. Radiographs and investigation of abscess did not clearly indicate dental disease as primary cause. Oral exam was WNL. Injectable antibiotics, antiinflammatories given. Oral antibiotics (doxycycline, enrofloxacin) and analgesics were attempted for 2 days with poor compliance. Appetite decreased and stool became soft. As of 1/29, animal stopped passing stool and although he was still interested in eating he was dropping lots of food in water bowl . Fluids and injectable analgesics were given

1/31: Exam under anesthesia--animal was noted to be hunched when walking prior to procedure. At exam, eye still edematous, but improving, and chemosis nearly resolved. Oral exam revealed the last molar in each upper arcade was loose and removed. Radiographs showed full rumen, and moderate amount of gas in intestines. Animal received fluids, antibiotics, metoclopramide, and was tubed with conspecific fecal slurry.
Blood work showed increased white cell count (25,000), hypoglycemia (17), increased BUN (72) and increased CK (3000). Recovery was prolonged and poor--animal reanesthetized to administer additional fluids, dextrose, antibiotics, steroids, oral peptobismol. Placed an IO catheter in left tibia and set up on IO LRS+2.5% dextrose drip. PM blood work showed worsening renal values, severe increase in CK (23,000). At last check at 5:30PM, animal was eating some and seemed more appropriate, though still lying down. At 9PM animal found deceased.

GROSS DESCRIPTION: On 2/2/2017 By ANC

Received is a 2.61 kilogram, adult, male Greater Malayan chevrotain (Avid Transponder 012360629) for necropsy on 1 February 2016 after being found dead following recovery from an anesthetic procedure. Also submitted are the left and right maxillary teeth in formalin. The carcass is in good postmortem condition and fair nutritional state with well-fleshed musculature but minimal subcutaneous or intra-abdominal adipose stores. There is an intravenous catheter in the left cephalic vein and an intraosseous catheter in the left tibia. There are patches of shaved skin on the left antebrachium, left hip, left stifle, right periocular skin, right ventral neck and right ventral abdomen. Bilaterally, the hind hooves are slightly overgrown, curling dorsally. The hoof wall of the right and left medial hind digits are irregularly eroded/worn.

The cranial third of the right cranial lung lobe is dark red and slightly rubbery (~5 to 10% of total lung volume). The lumen of the trachea contains scant fibrous green ingesta and the tracheal mucosa is diffusely mildly hyperemic with injected vessels. Few strands of fibrin are loosely attached to the cranial surface of the right and left ventricular epicardium.

The oral cavity and esophagus are filled with large amounts of moderately-coarse, fibrous, green material (ingesta). The last maxillary molar is absent on the right and left and the adjacent gingiva is mildly reddened and swollen. The molars and premolars have even wear and a small amount of dental calculus. The rumen and reticulum contain abundant, moderately coarse, dark to pale green, fibrous ingesta. The abomasum contains a moderate amount of pale tan, fine, fibrous ingesta mixed with mucus. The fundic mucosa has dozens of 1-2 mm diameter, dark red discolorations. The small intestine is multifocally dilated and filled with small amounts of pasty to watery, thin, dark brown fluid. The cecum is filled with abundant, thick, pasty green feces. The colon contains scant soft, pale green, unformed feces. The urinary bladder is filled with ~50 mL of clear, dark yellow urine.

The right eyelids are sutured closed and there is a 2 mm diameter puncture wound in the skin of the lower lid (lanced abscess site). The palpebral and bulbar conjunctiva of the right eye is slightly wet and swollen. A small amount of friable pale tan to red material lines the inner and outer aspects of the ventral portion of the bony orbit. The adjacent masseter muscle is slightly reddened. The cornea is

diffusely cloudy. In the subcutis along the bridge of the nose, there is a ~5 x 3 cm area of acute hemorrhage. The right and left dorsal nasal turbinates are discolored brown (presumptive regurgitation).

The remaining organs are grossly unremarkable.

GROSS DIAGNOSIS: By ANC

Eye (right): Moderate, diffuse corneal edema with conjunctivitis and periocular cellulitis
Lung (right cranial): Mild, acute, cranioventral pneumonia (presumptive aspiration)
Trachea: Diffuse mucosal hyperemia with intraluminal feed material (presumptive aspiration)
Abomasum: Mild, multifocal, acute, mucosal petechial hemorrhage
Pericardial sac: Mild acute fibrin exudation
Subcutis (dorsorostral skull): Mild to moderate, focal, acute hemorrhage
Fair body condition with minimal adipose stores

LABORATORY STUDIES:

TISSUE STATUS:

SHELVED:	False
TRIMMED:	True
FROZEN:	False
ULTRAFROZEN:	True

Tissues Ultrafrozen: Lung, liver, kidney, small intestine, colon

SPECIAL REQUESTS: On By

HISTOLOGY: On 3/9/2017 By ANC

1. BRAIN, CEREBRUM, BRAINSTEM; PITUITARY GLAND: There are multiple small mineral concretions in the pars distalis.
2. BRAIN, CEREBRUM, THALAMUS: WNL.
3. BRAIN, HIPPOCAMPAL, MIDBRAIN: WNL.
4. BRAIN, MIDBRAIN: WNL.
5. BRAIN, CEREBELLUM, BRAINSTEM: WNL.
6. LUNG, RIGHT CRANIAL, ACCESSORY: Many bronchi and bronchioles are filled with neutrophils, fewer macrophage, erythrocytes, mixed bacteria, keratinized squamous epithelium and foreign plant material. Surrounding alveoli are flooded with neutrophils, macrophages and proteinaceous fluid. Respiratory epithelium in affected airways is multifocally denuded. Alveolar septal capillaries are congested and interlobular septa have increased clear space (interlobular edema).
7. LUNG, RIGHT CAUDAL, LEFT CRANIAL, LEFT CAUDAL: Small amounts of foreign plant material are present in airways accompanied by inflammation as previously described.
8. KIDNEY; ADRENAL GLANDS: The mesangium of many glomerular tufts is segmentally expanded by homogeneous pale eosinophilic material. Rare glomerular tufts are shrunken and sclerotic and few tubules are dilated and filled with protein casts.
9. LIVER; GALLBLADDER; SPLEEN: In the liver, many hepatocytes have small amounts of pale brown cytoplasmic pigment. Few lymphocytes infiltrate portal tracts.
10. HEART: Epicardial adipocytes are atrophic.
11. RUMEN; RETICULUM: The lamina propria contains small mineral concretions and few scattered lymphocytes.
12. ABOMASUM; DUODENUM; PANCREAS: WNL.
13. JEJUNUM; ILEUM: WNL.
14. CECUM; SPIRAL COLON: WNL.
15. URINARY BLADDER; ACCESSORY SEX GLANDS; URETHRA; TESTIS: There is active spermatogenesis and mature spermatids in the epididymis.
16 A. EYELIDS, RIGHT: The palpebral conjunctival epithelium is broadly ulcerated and the underlying stroma is thickened due to deposition of granulation tissue. Granulation tissue is infiltrated by large numbers of neutrophils and fewer macrophages, lymphocytes and plasma cells and has widespread hemorrhage. The exposed stroma is overlain by necrotic cell debris, viable and degenerate neutrophils, streaming nuclear debris and mixed bacteria. The surrounding palpebral conjunctiva is infiltrated by neutrophils. Blood vessels are often cuffed by many lymphocytes and plasma cells. The epidermis of the palpebra is multifocally necrotic and infiltrated by neutrophils.
16 B. TONGUE; TRACHEA; ESOPHAGUS; THYROID: The tracheal mucosa is variably absent, edematous or infiltrated by few neutrophils. The lumen contains neutrophils, mucus, cellular debris and foreign plant material.
17. EYE, RIGHT: The superficial corneal stroma lacks artifactual clefting and is infiltrated by neutrophils, fewer macrophages, karyorrhectic debris and spindloid to stellate cells. Peripherally, the corneal stroma contains small caliber blood vessels. Segmentally, the corneal epithelium is attenuated or absent. The adjacent conjunctiva is multifocally infiltrated by neutrophils. Blood vessels in the iris leaflets are occasionally surrounded by few plasma cells.
18. EYE, LEFT: WNL.
19. MAXILLARY MOLAR TOOTH, LEFT (EXTRACTED): There is only a small section of dense fibrous connective tissue and gingival epithelium.
20. MAXILLARY MOLAR TOOTH, RIGHT (EXTRACTED): WNL.
21. NASAL TURBINATES: WNL.

22. RIGHT MAXILLARY MOLAR: Dorsal, medial and lateral to the maxillary alveolar bone, large numbers of macrophage, lymphocytes, plasma cells and fewer neutrophils infiltrate edematous and hemorrhagic fibrous connective tissue and skeletal muscle. Dorsal to this, there is a layer of inflamed granulation tissue as described in the periocular tissues. Focally, there is a dense aggregate of epithelioid macrophages and intact and degenerate neutrophils surrounded by lymphocytes and plasma cells within the medullary cavity of the maxillary bone and abut the dentin of a tooth. The cortical alveolar bone adjacent to inflamed regions often has resorption or periosteal new bone formation. There is hemorrhage surrounding large blood vessels adjacent to the periodontal ligament.
23. RIGHT MAXILLARY MOLAR: There is similar but less intense inflammation as previously described within the soft tissues surrounding the alveolar bone
24. RIGHT MAXILLARY MOLAR: An empty alveolus (tooth extraction site) is filled with fragments of necrotic bone and gingival, hemorrhage, foreign plant debris, bacteria and mixed inflammatory cells (predominantly neutrophils). The adjacent periodontal ligament, alveolar bone and surrounding soft tissues are inflamed as previously described. There is marked new periosteal bone formation on the adjacent maxillary bone and gingival hyperplasia.

MORPHOLOGIC DIAGNOSIS:

1) Maxilla, right: Moderate, focally extensive, chronic, pyogranulomatous osteomyelitis, cellulitis and myositis with bone remodelling and granulation
2) Palpebra, lower right: Moderate, chronic, suppurative conjunctivitis and cellulitis with ulceration, granulation tissue and abscessation
3) Eye, right: Moderate, chronic, diffuse keratitis with erosion and ulceration
4) Eye, right: Mild, chronic, plasmacytic anterior uveitis
5) Lung: Moderate, multifocal, acute, suppurative bronchopneumonia with intraluminal plant material (aspiration pneumonia)
6) Trachea: Mild, acute, suppurative tracheitis with intraluminal plant material (aspiration)
7) Kidney: Mild, multifocal tubular proteinosis
8) Kidney: Mild, focal, segmental mesangial glomerulopathy

REMARKS: On 3/9/2017 By ANC

3/9/17: Examination of the right maxilla revealed marked chronic inflammation that involved the tooth root and surrounding alveolar bone. Based on the chronicity of this lesion and the associated bone remodelling, an ascending tooth root infection is likely to have preceded and subsequently caused the periocular abscessation. Histology confirmed aspiration of feed material as the cause of pneumonia. Based on the acute nature of inflammation in the lungs, aspiration likely occurred closer to the second, more recent anesthetic event. Death is attributed to a combination of maxillary and periocular infection and aspiration pneumonia. The results of blood and lung culture are suggestive of sepsis; however, there is little histologic evidence (multisystemic hemorrhage, thrombosis, necrosis) to support this.

Cartoceti	CARTOCETI	3/9/2017
PROSECTOR	PATHOLOGIST	DATE COMPLETED

Printed on: 3/9/2017 10:56:45 AM CARES-MED v2.119

Pathology Module - Final Pathology Report
NATIONAL ZOOLOGICAL PARK

PATH # N2017-0021

Death Date: 2/1/2017
Necropsy Date: 2/1/2017

PHOCA VITULINA (no subsp)
Harbor seal
Name: Squeegee

Gender: Male
Age: 31Y 11M 0D

Accession No.: 114859
Birth: 01 Mar 1985
Acquired: 16 Oct 2012
Removed: 01 Feb 2017

SEX: Male | AGE: 31Y 11M 0D | WEIGHT: 119.545 kg | STAY: > 30 Days

MANNER OF DEATH:Died
TIME OF DEATH:03:15P
DEATH LOCATION:American Trail
SUBMITTOR:KLH
OWNER/ANIMAL DEPT:DOM - Beaver Valley

INTERVAL:0-6 hours
XRAYED:False
DISPOSITION:INCINERATE
PROSECTOR:Cartoceti

HISTORY AND CLINCICAL OBSERVATIONS:

KEEPER OBSERVATIONS: On By

CLINICIAN OBSERVATIONS: On 2/1/2017 By KLH

Geriatric seal with 1 month history of hematuria, 1 year history of nail bed infections on front flippers, and chronic ocular disease (controlled glaucoma).
Anesthesia today for diagnostic work up. Animal was stable throughout anesthesia, but had prolonged recovery that was progressing (increased tone and mild responsiveness), but after about 45 minutes animal became bradycardic. Atropine and additional reversals administered and animal responded appropriately. Blood gas values at that point indicated respiratory acidosis. Continued positive pressure ventilation with continuous breaths, and heat and additional fluids administered as well. Acupuncture, dopram, and additional reversals given, and after about 4 hours animal woke fairly quickly and displayed rhythmic excitatory side to side movements for a few minutes. Then calmed down and was breathing intermittently on his own, but did not regain vision and continued to have less frantic side to side movements. After another few minutes, he relaxed and was observed to be breathing for about 5 minutes, at which point he took a few shorter breaths and then appeared to arrest. Cardiopulmonary resuscitation was instituted immediately with several rounds of IM, IV, and intratracheal epinephrine, atropine, and dopram, but animal did not recover.

GROSS DESCRIPTION: On 2/2/2017 By ANC

Received is a 119.5 kilogram, intact male, adult harbor seal for necropsy on 1 February 2017 following death during recovery from an anesthetic procedure. Also submitted are portions of nail in formalin. The carcass is in good postmortem condition and good nutritional state with well-fleshed muscles and abundant subcutaneous adipose. The blubber layer measures 4 cm thick over the spine of the scapula, 3.5 cm over the dorsal thoracic spine, 4 cm over the ribs, 3.5 cm over the hip joint and 2.2 cm over the tail base. Multifocally in the blubber layer, there are linear tracts of red to white discoloration of the fat (presumptive injection sites). There are multiple circular to linear tracts of alopecia and slightly thickened, irregular, raised skin along the ventral abdomen (dermal scars). The keratin layer of the digits of the forelimbs is variably cracked and flaking, exposing the underlying nailbed.

A small amount of mucus is present in the larynx and there are bilaterally symmetric foci of red discoloration with central pallor along the medial aspects of the right and left arytenoid cartilages (presumptive intubation artifact). The tracheal mucosa is moderately hyperemic and there are small amounts of slightly cloudy mucus (presumptive intubation artifact) in the lumen. Multifocally in the lungs, there is subpleural gas accumulation (presumptive resuscitation artifact). Several lobules along the periphery of lung lobes are pale pink and the remaining pulmonary parenchyma is red to dark red. The tracheobronchial lymph node is darkly pigmented. The heart is subjectively enlarged, with dilated and flaccid right and left ventricular free walls and a rounded apex. The valve circumferences are 18 cm tricuspid valve, 14 cm mitral valve, 10.5 cm aortic valve and 12 cm pulmonic valve.

Within both kidneys, the calyces of many lobules are dilated and filled with one or more, round to oblong, smooth-contoured, pale tan liths. The largest lith measures ~1.5 cm x 0.5 cm in diameter, is branching and spans adjacent renal calyces. The urinary bladder contains ~12 mL of dark red, watery urine. The mucosa of the urethra at the level of the pelvic flexure is mildly reddened.

The stomach contains a small amount of orange-brown mucus and squid beaks. The small intestine contains scant, pasty, grey ingesta. The colon contains scant, soft, pale brown feces.

The right and left corneas are diffusely mildly translucent white with few small caliber blood vessels. There is a central depression in the cornea of one eye (presumed left). The lenses of both eyes have irregular branching white opacities.

Throughout the dura mater, there are innumerable, <1 to 2 mm diameter, firm, pale tan nodules (presumptive meningeal fibrosis).

There is mild to moderate wear of the incisor and canine teeth.

The remaining organs are grossly unremarkable.

GROSS DIAGNOSIS: By ANC

Kidneys: Moderate, bilateral, multifocal renolithiasis with hematuria
Eyes: Moderate, bilateral, chronic keratitis
Eyes: Moderate, bilateral lenticular cataracts
Digits, forelimbs: Moderate, multifocal paronychia (presumptive)

LABORATORY STUDIES:

TISSUE STATUS:

SHELVED:	False
TRIMMED:	True
FROZEN:	False
ULTRAFROZEN:	True

Tissues Ultrafrozen: Liver (2), kidney, lung, toenail, tracheobronchial lymph node, heart, urine

SPECIAL REQUESTS: On By

HISTOLOGY: On 3/13/2017 By ANC

1. BLUBBER: Multifocally, groups of adipocytes are replaced by granular eosinophilic material admixed with erythrocytes and clear cholesterol clefts.
2. LYMPH NODE, TI(?); URINARY BLADDER; PROSTATE: In the lymph node, macrophages in medullary cords have abundant black cytoplasmic granules. Medullary sinuses contain erythrocytes.
3. TONSILS: WNL.
4. HEART, RIGHT AV VALVE, INTERVENTRICULAR SEPTUM, LEFT AURICLE: WNL.
5. HEART, LEFT PAPILLARY MUSCLE: WNL.
6. HEART, LEFT AV VALVE: WNL.
7. HEART, INTERVENTRICULAR SEPTUM: WNL.
8. HEART, INTERVENTRICULAR SEPTUM, LEFT PAPILLARY MUSCLE: WNL.
9. HEART, SA NODE SECTION: WNL.
10. LUNG: Multifocally, there are large empty cystic spaces in the subpleural connective tissue (presumed resuscitation artifact). Interlobular septa have increased clear space (edema). Many alveolar capillaries are congested. Small numbers of lymphocytes surround medium caliber blood vessels adjacent to bronchi and bronchioles. Scattered perivascular macrophages contain black, granular, cytoplasmic pigment.
11. LUNG: WNL.
12. THYROID; PARATHYROID; LYMPH NODE, AXILLARY: In the thyroid, many follicles lack colloid and are lined by cuboidal epithelium. Multifocally, there are small, well-demarcated, unencapsulated nodules that subtly compress the surrounding tissue and are composed of enlarged follicles of varying size lined by cuboidal epithelium that occasionally folded forming papillary projections into the lumen (multinodular hyperplasia).
13. LYMPH NODE, TRACHEOBRONCHIAL; LUNG: Macrophages in subcapsular sinuses and medullary cords contain abundant black, granular cytoplasmic pigment. The lung is as described previously. There is a dense focus of mineral surrounded by thin rim of fibrous connective tissue.
14. ESOPHAGUS; STOMACH, CARDIA: WNL.
15. TESTIS; EPIDIDYMIS: There is active spermatogenesis and mature spermatids in the epididymis.
16. TRACHEA: The tracheal mucosa is focally ulcerated and the exposed stroma is infiltrated by neutrophils. The ulceration is overlain with mucus admixed with neutrophils.
17. LARYNX: The mucosa is multifocally eroded and infiltrated by neutrophils.
18. LIVER; GALL BLADDER: In the liver, many hepatocytes and Kupffer cells contain small amounts of granular, pale brown pigment (presumptive hemosiderin). Few hepatocytes have lipid type vacuolation. Few lymphocytes, macrophages and plasma cells infiltrate some portal tracts.
19. SPLEEN; ADRENAL: In the adrenal gland, there are two foci of acute hemorrhage in the zona fasciculata. Focally, there are cords and acini of cortical epithelium embedded within the adrenal capsule. Many red pulp macrophages contain abundant granular, pale brown pigment (presumptive hemosiderin).
20. KIDNEY WITH LITH: Urinary spaces of calyces are expanded with clear space or contain laminar concretions of mineral. The transitional epithelium lining calyces varies from 4 cells thick to absent and the underlying connective tissue is expanded by clear space. Few erythrocytes are occasionally present in the urinary space, epithelium or subepithelial stroma (hemorrhage). Collecting ducts at the renal papillae are occasionally replaced by granular mineral. Rare glomeruli are obsolescent.
21. KIDNEY WITHOUT LITH: As described previously.
22. URETHRA; URETERS: Small numbers of lymphocytes and fewer plasma cells infiltrate the urethral mucosa.
23. STOMACH: Segmentally, there is a band of diffuse eosinophilia and loss of differential staining within the superficial gastric mucosa (autolysis?). In this area, surface and glandular epithelium is predominantly absent.
24. STOMACH; COLON: The stomach is as described previously in four discrete foci. In the colon, blood vessels in the mucosa and submucosa are often dilated and contain rafts of fibrin with enmeshed neutrophils in their lumina.
25. DUODENUM; PANCREAS; BILE DUCT; LYMPH NODE, PERIPANCREATIC; ILEUM: In the wall of the common bile duct, sacculi of Beale and periductal glands are numerous and are surrounded by abundant fibrous connective tissue and smooth muscle that is multifocally infiltrated by lymphocytes.
26. COLON; CECUM; LYMPH NODE, MESENTERIC: In the colon, few lymphocytes and plasma cells infiltrate below crypts.
27. PITUITARY GLAND; DURA MATER: Multifocally, the dura mater is thickened by excess dense, mature, fibrillar collagen.

28. BRAIN, CEREBRUM: There is widespread scattered microhemorrhages in the grey matter and less so in the white matter tracts (agonal hemorrhage). Few psammoma bodies are present in the leptomeninges.
29. BRAIN, CEREBRUM, THALAMUS: As previously described.
30. BRAIN, CEREBRUM, THALAMUS: As previously described.
31. BRAIN, CEREBRUM THALAMUS: As previously described. Hemorrhage is more severe in the cerebrum.
32. BRAIN: As previously described.
33. BRAIN: As previously described.
34. BRAIN: As previously described.
35. BRAIN: As previously described.
36. BRAIN: As previously described.
37. BRAIN: As previously described.
38. BRAIN: As previously described.
39. BRAIN: As previously described.
40. EYE, LEFT: In the vitreous, there are many small aggregates of granular basophilic material (asteroid hyalosis). The superficial corneal stroma contains small blood vessels, increased numbers of spindloid cells. Centrally, the corneal stroma is thinned. The corneal epithelium is multifocally folded. Few plasma cell infiltrate near the limbus. Few lymphocytes and plasma cells surround blood vessels in the bulbar conjunctiva. There is an empty capsular bag in the vitreous.
41. EYE, RIGHT: As described in the left eye. There are small aggregates of plasma cells in the iridocorneal drainage angle beneath the trabecular meshwork. There is an empty capsular bag between the iris leaflets.
42. LENS, LEFT AND RIGHT: The lens lacks an obvious capsule or epithelium. Lens fibers are histologically unremarkable.
43. NAIL: The slide contains only small fragments of compact, orthokeratotic keratin that are occasionally lined by granular basophilic debris and few erythrocytes.
44. NAILBED: Within the subepithelial connective tissue of the nailbed and surrounding skin, blood vessels are surrounded by loose fibrous connective tissue that is infiltrated by many lymphocytes, plasma cells and fewer macrophages.
45. NAIL BED: As previously described. Foclly in the nailbed sulcus, there are aggregates of fragmented keratin colonized by non-parallel walled fungal hyphae with large bulbous projections. The adjacent epidermis is eroded and infiltrated by many neutrophils.
46. ETHMOID TURBINATES: WNL.

MORPHOLOGIC DIAGNOSIS:

1) Kidneys: Moderate, multifocal, renolithiasis with transitional cell hyperplasia and ulceration and hematuria
2) Eyes: Moderate, bilateral, chronic keratitis
3) Nailbeds, forelimbs: Moderate, multifocal, chronic-active, suppurative, perionychitis with keratin fragmentation and intralesional fungal hyphae
4) Kidneys: Mild, multifocal glomerular obsolescence
5) Urethra: Mild, chronic, lymphoplasmacytic urethritis
6) Adipose, blubber layer: Mild, multifocal, acute fat necrosis and hemorrhage
7) Lung, tracheobronchial lymph node: Anthracosilicosis
8) Larynx, trachea: Mild, multifocal, acute catarrhal and neutrophilic tracheitis and laryngitis with ulceration (presumed endotracheal intubation)
9) Common bile duct: Mild, multifocal, chronic, lymphocytic choledochitis
10) Eye, right: Minimal, chronic, plasmacytic anterior uveitis

REMARKS: On 3/13/2017 By ANC

3/13/17: Histology did not reveal any additional underlying diseases that might have contributed to poor anesthetic recovery. Aside from hemorrhage into the urinary space, renolithiasis appears to have elicited minimal inflammation or degeneration within the kidneys. Renoliths are 100% ammonium urate. The lenses in both eyes were quite abnormal, consisting of shrunken, orange lens fibers that were still intact and not cataractous (i.e. still transparent). This may represents the unresorbed nuclear center of previously cataractous lenses. Oddly, this remnant lens fiber material was found separate from an empty capsular bag in each eye. Capsular rupture typically results in both severe uveitis and cataract formation, so this finding is likely artifactual. Fungal infection of the nailbeds was confirmed; morphologically fungi appear to be of the Zygomycota type. Acute blubber necrosis and hemorrhage is suspected to be due to either agonal trauma or injections. The remaining diagnoses are considered mild and less clinically significant.

Cartoceti	CARTOCETI	3/13/2017
PROSECTOR	PATHOLOGIST	DATE COMPLETED

Printed on: 3/13/2017 1:48:40 PM CARES-MED v2.119

Pathology Module - Final Pathology Report
NATIONAL ZOOLOGICAL PARK

PATH # N2017-0022

Death Date: 2/2/2017
Necropsy Date: 2/2/2017

ELAPHODUS CEPHALOPHUS CEPHALOPHUS Gender: Female
Tufted deer Age: 24Y 7M 23D
Name: MORTICIA

Accession No.: 111527
Birth: 10 Jun 1992
Acquired: 02 Nov 1994

On loan from SAN DIEGO ZOOLOGICAL GARDEN, SAN DIEGO

SEX: Female AGE: 24Y 7M 23D WEIGHT: 19.5 kg STAY: > 30 Days
MANNER OF DEATH:Euthanasia INTERVAL:0-6 hours
TIME OF DEATH:09:30a XRAYED:False
DEATH LOCATION:Rivinus Barn DISPOSITION:INCINERATE
SUBMITTOR:Priscilla Joyner PROSECTOR:Cartoceti
OWNER/ANIMAL DEPT:DCM

HISTORY AND CLINCICAL OBSERVATIONS:

KEEPER OBSERVATIONS: On By

CLINICIAN OBSERVATIONS: On 2/2/2017 By PJ

Individual is aged with chronic bilateral hypermature cataracts and overgrown hooves. History of dental disease. Abnormal hindlimb gait developed in recent weeks, treated with meloxicam, tramadol and gabapentin but no improvement. Today animal had wide based stance, high stepping bilateral hindlimbs and mild ataxia in hind end. Suspected severe spondylosis based on presentation and history of collection. Because we are no longer able to keep this individual comfortable euthanasia was planned.

Wt 19 kg. Induced anesthesia with medetomidine, butorphanol, azaperone and ketamine prior to euthanasia with Euthasol 5 ml given IV. Radiographs confirmed severe spondylosis of lumbar vertebra.

GROSS DESCRIPTION: On 2/3/2017 By ANC

Received is a 19.5 kilogram, intact female, tufted deer for necropsy on 2 February 2012 following euthanasia. The carcass is in good postmortem condition and good nutritional condition with well-fleshed muscles and adequate subcutaneous and abundant intra-abdominal adipose stores. The left ear has one dorsal notch, one ventral notch and a red tag that reads "0003." The right ear has one dorsal notch and a tattoo that is no longer legible. A microchip cannot be found. Over the left hip, there is a region of shaved skin with a central ~1 cm square of absent skin (genetic testing).

Multifocally, the omentum is firmly adhered to the body wall along the left flank and midline. Both kidneys have an irregularly pitted cortical surface. There are multiple 1-3 mm diameter white discolorations and fluid filled cysts along the corticomedullary junction. The caudal portion of ventral sac of the rumen is conical, contracted and tapers to a dark brown, ~1 cm diameter, blunted end with a circumferential firm white band. The rumen contains coarse, fibrous, green ingesta. There are dozens of bulbous outpouchings in the wall of the duodenum; the largest is ~3 cm in diameter. The small intestine contains pasty, green ingesta. The descending colon contains formed feces.

There is severe, uneven wear of all maxillary and mandibular cheek teeth with lingual points on the left mandibular teeth and buccal points on the maxillary and right mandibular teeth. The hooves are overgrown; most severely overgrown is the right medial digit which is elongated and curves dorsally. All appendicular joints examined (shoulders, elbows, carpi, hips, stifles, tarsi) have mild to severe roughening, fibrillation and eburnation of articular cartilage. Cartilage eburnation is most severe along the medial femoral condyle and corresponding medial tibial plateau of both stifle joints. In the right medial tibial plateau, there is a 2 mm diameter white discoloration with central reddening (presumptive bone necrosis). There is periarticular, hard, bony proliferation covered by articular cartilage (osteophyte proliferation) along the margins of both glenohumeral joints. The right stifle joint contains a ~3 x 2 x 1 mm free floating osteophyte in the joint space. Along the ventral aspect of the thoracic and lumbar vertebral bodies, there is irregular, hard, bony proliferation that distorts the normal vertebral shape. At the L3-4 and L4-5 joints, bone proliferation is most severe and forms a ~1.5 cm bony projection that bridges adjacent vertebral bodies.

The lenses of both eyes are diffusely translucent to opaque white.

Addendum (2/3/17): The reproductive tract was delivered intact to P. Commizzoli. Following return of the tract, the vaginal lumen was found to be filled with ~15 mL of thick, pasty, pale brown exudate (cytology = abundant squamous epithelial cells). At the entrance to the vagina, just cranial to the urethral opening, there is ~1 cm wide band of circumferential thickened and firm vaginal wall that causes constriction of the lumen.

The remaining organs are grossly unremarkable.

GROSS DIAGNOSIS: By ANC

Joints (stifles): Moderate to severe, chronic, degenerative joint disease with intra-articular osteophytosis and presumptive bone necrosis (right side only)
Vertebrae (thoracic, lumbar): Mild to severe, chronic, spondylosis with ventral body osteophytosis and

bridging
Joints (shoulders): Moderate, chronic, degenerative joint disease with periarticular osteophytosis
Joints (elbows, carpi, hips, tarsi): Mild, chronic, degenerative joint disease
Kidneys: Mild, chronic nephropathy (presumptive nephritis)
Eyes: Chronic bilateral cataracts
Duodenum: Moderate, multifocal diverticulosis
Teeth: Moderate to severe dental attrition

Addendum (2/3/17)
Vagina: Segmental mural stricture with mucovagina and inspissated epithelial cells

LABORATORY STUDIES:

TISSUE STATUS

SHELVED:	False
TRIMMED:	True
FROZEN:	False
ULTRAFROZEN:	True

Tissues Ultrafrozen: Lung, liver, kidney

SPECIAL REQUESTS: On 2/2/2017 By PJ

1 cm square skin sample from left hip obtained for researcher B. Pukazhenthi.
Repro tract for researcher P. Comizzoli

HISTOLOGY: On 3/2/2017 By ANC

1. LUNG: Multifocally, alveoli and airway lumina contain large, ciliated protozoa (postmortem regurgitation). The margin of one section is thickened by excess pleural connective tissue.
2. THYROID; PARATHYROID; ADRENAL; URINARY BLADDER: The lamina propria of the bladder is infiltrated by few lymphocytes which sometimes form small nodular aggregates. In the thyroid glands, rare follicles are dilated and filled with grey homogeneous material. Within the parathyroid glands, there are multiple cross sections through ducts lined by squamous epithelium and filled with keratin and granular eosinophilic debris (presumptive ultimobranchial duct cysts).
3. LIVER: Multifocally, there are small sinusoidal aggregates of lymphocytes and fewer macrophages as well as scattered foci of extramedullary hematopoiesis.
4. KIDNEY; SPLEEN: In the kidney, tubules/collecting ducts in the renal papilla are often dilated and filled with proteinaceous fluid or are mineralized. The surrounding intersitium is thickened by hyalinized eosinophilic material. In the cortex, there are radiating wedges of small, condensed tubules filled with protein casts and lined by attenuated epithelium. The surrounding intersitium is mildly thickened by increased fibrous connective tissues and infiltrates of lymphocytes that sometimes form nodular aggregates. The corresponding capsular surface is indented. Glomerular density is increased and glomeruli are often surrounded by small amounts of fibrous connective tissue and have hypertophied parietal epithelium.
5. KIDNEY: As previously described.
6. HEART; LEFT PAPILLARY, INTERVENTRICULAR SEPTUM: There are small aggregates of mineral within the fibrous insertion of the cordae tendinae.
7. HEART; LEFT ATRIUM and AV VALVE: WNL.
8. TRACHEA; ESOPHAGUS; TONGUE: In the lamina propria and mucosal epithelium of the trachea there are scattered neutrophils.
9. RUMEN: The lumen contains many cilliated protozoa. Segmentally the tunica mucosa thins and becomes absent in the wall (diverticulum), and submucosal blood vessels are surrounded by few lymphocytes and plasma cells.
10. RETICULUM; OMASUM; ABOMASUM: In the lamina propria of gastric pits and superficial gastric glands, there are few infiltrating lymphocytes, plasma cells and fewer eosinophilic granular cells.
11. ABOMASUM; DUODENUM; PANCREAS: The abomasum is as described previously. In the duodenum, the tunica muscularis is multifocally discontinuous and the submucosa and muscularis mucosa directly abut the serosa (pseudodiverticula). Few eosinophilic granular cells infiltrate the duodenal mucosa.
12. DUODENUM; COLON: The duodenum is as described previously.
13. JEJUNUM; ILEUM; SPIRAL COLON: In the small intestine, eosinophils infiltrate the lamina propria. Segmentally in the spiral colon, lymphocytes and plasma cells occasionaly aggregate in the muscularis mucosa, subtly elevating crypts.
14. CECUM; SCIATIC NERVE: In the cecal lamina propria, there are few eosinophils and scattered aggregates of pigment-laden macrophages.
15. VAGINA; VESTIBULE: At the level of the urethral orifice, the vaginal/vestibular epithelium (stratified squamous) and underlying stroma are infiltrated by few neutrophils and lymphocytes. The subepithelial stroma consists of abundant dense mature fibrillar collagen with many embedded small caliber blood vessels. Segmentally, the vaginal epithelium becomes simple columnar with some ebmedded glands (remnant of vas deferens?).
16. OVARY; UTERINE HORNS AND BODY: There is occasional cystic dilation of endometrial glands. Uterine arteries are thickened and hyalinized.
17. VESTIBULE: The vestibular mucosa is inflamed as previously described.
18. LYMPH NODES, RETROPHARYNGEAL; TONSILS: Sinuses in the lymph node are filled with macrophages, that often form aggregates containing particulate material within their cytoplasm. Medullary cords contain many plasma cells.
19. BRAINSTEM, OBEX: WNL.
20. BRAIN, CEREBRUM: Focally, there is a small region of neuropil replaced by hemorrhaged erythrocytes,

multinucleated giant cells and pigment laden macrophages surrounded by fibrillary astroctyes and astrogiosis.
21. BRAIN, CEREBRUM, THALAMUS: WNL.
22. BRAIN, CEREBRUM, THALAMUS, HIPPOCAMPUS: WNL.
23. BRAIN, CEREBRUM, THALAMUS, HIPPOCAMPUS: In the piriform lobe, there are two similar foci of inflammation and gliosis as previously described.
24. BRAIN, MIDBRAIN: WNL.
25. BRAIN, CEREBELLUM, LONGITUDINAL: WNL.
26. BRAIN, CEREBELLUM, TRANSVERSE: Blood vessels within the white matter tracts have mineralized walls.
27. BRAIN, CEREBELLUM, TRANSVERSE; BRAINSTEM: WNL.
28. SPINAL CORD, CERVICAL: Ventrally, there is mineralization along in the inner aspect of the dura mater.
29. SPINAL CORD, LUMBAR: Ventrally and ventrolaterally, there is mineralization along in the inner aspect of the dura mater.
30. EYE, LEFT: In the superficial anterior lens stroma, there is loss of fiber definition and scattered epithelial cells within lakes of eosinophilic to pale basophilic material.
31. EYE, RIGHT: Lens fibers are as described in the left eye.

MORPHOLOGIC DIAGNOSIS:

1) Joints (shoulders, elbows, carpi, hips, stifles, tarsi): Mild to severe, chronic, degenerative joint disease (gross diagnosis)
2) Vertebrae (thoracic, lumbar): Mild to severe, chronic, spondylosis with ventral body osteophytosis and bridging (gross diagnosis)
3) (A) Kidneys: Moderate, multifocal, chronic, lymphocytic interstitial nephritis with interstitial fibrosis, tubular proteinosis and mineralization
3) (B) and periglomerular fibrosis (chronic infarcts)
4) Duodenum: Pseudodiverticulosis
5) Vestibule: Mild, segmental, chronic, lymphocytic and neutrophilic vestibulitis
6) Vagina: Segmental mural stricture with mucovagina and inspissated epithelial cells (gross diagnosis)
7) Urinary bladder: Mild, diffuse, chronic, lymphocytic cystitis
8) Brain: Mild, multifocal, chronic, granulomatous encephalitis with hemorrhage and astrocytosis
9) Eyes: Bilateral cataracts

REMARKS: On 3/2/2017 By ANC

3/2/17: Histologic lesions were not identified in the spinal cord or sciatic nerves and, as such, this animal's abnormal gait/posture are suspected to be due to pain associated with advanced degenerative joint disease in the axial and appendicular skeleton. Renal lesions are consistent with age-related degeneration and vascular infarcts. Duodenal diverticula are histologically represented by herniation of the mucosa due to multifocal absence of the tunica muscularis, a condition that is referred to as acquired diverticula/pseudodiverticulosis. This is an uncommon disease that has been reported in humans, equids, pigs, sheep, an elk and a cat and is often clinically insignificant unless it results in intestinal perforation and peritonitis (not present in this tufted deer). Histology of the vagina/vestibule revealed mild chronic inflammation in the mucosa but obvious scarring was not evident in the region of vaginal stricture; however, trauma to the vagina during previous dystocia is still considered the most likely etiology of mucovagina. Foci of granulomatous inflammation in the cerebrum are suspicious for prior parasite migration tracts.

Cartoceti	Andrew Cartoceti	3/2/2017
PROSECTOR	PATHOLOGIST	DATE COMPLETED

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Pathology Module - Final Pathology Report
NATIONAL ZOOLOGICAL PARK

PATH # N2017-0031

Death Date: 2/21/2017
Necropsy Date: 2/21/2017

ATELOPUS ZETEKI
Panamanian golden frog
Name:

Gender: Female
Age: 11Y 7M 17D

Accession No.: 307642
Birth: 04 Jul 2005
Acquired: 13 Sep 2016
Removed: 21 Feb 2017

On loan from BALTIMORE ZOO, BALTIMORE

SEX: Female | AGE: 11Y 7M 17D | WEIGHT: 6.1 gm | STAY: > 30 Days

MANNER OF DEATH: Found Dead
TIME OF DEATH: 10:30A
DEATH LOCATION: Room 5 basement of RDC
SUBMITTOR: Matt Evans
OWNER/ANIMAL DEPT: DOH

INTERVAL: 0-6 hours
XRAYED: False
DISPOSITION: FORMALIN
PROSECTOR: Andrew Cartoceti

HISTORY AND CLINCICAL OBSERVATIONS:

KEEPER OBSERVATIONS: On 2/21/2017 By ME

This female Panamanian golden frog was found dead today in tank 7 within basement room 5 of RDC. She lived with 6 other female golden frogs in tank 7. She is an adult roughly 10 years old. This frog is autolyzed, most likely died over the weekend. She has some sloughing skin and areas around her face and chin are sunken in. All other frogs in this tank look and are acting normal.

CLINICIAN OBSERVATIONS: On By

GROSS DESCRIPTION: On 2/21/2017 By ANC

Received is a 6.1 gram, adult, female Panamanian golden frog for necropsy on 21 February 2017. The carcass is in poor postmortem condition with a putrid odor, sloughing of the skin and fragility of the coelomic organs. Sphagnum moss and thick, mucoid, pale pink-tan material is loosely adhered to the ventrum and legs. Fat bodies cannot be assessed due to autolysis. The eyes and intermandibular skin is deeply sunken. The ovaries contain dozens of vitellogenic follicles, few of which are ruptured. The heart, liver, kidneys and intestines are grossly unremarkable.

Impression smears of the ventrum and feet revealed abundant bacteria, fungal-like hyphae and few squamous epithelial cells (presumptive autolysis).

GROSS DIAGNOSIS: By ANC

No significant gross lesions identified
Advanced autolysis

LABORATORY STUDIES:

CYTOLOGY: Ventrum and feet impression smears (DiffQuick) = abundant bacteria, fungal-like hyphae and few squamous epithelial cells (presumptive autolysis).

TISSUE STATUS:

SHELVED:	False
TRIMMED:	True
FROZEN:	False
ULTRAFROZEN:	True

Tissues Ultrafrozen: Liver, hindfoot

SPECIAL REQUESTS: On By

HISTOLOGY: On 3/23/2017 By ANC

1. HEART; TONGUE; LIVER; SPLEEN, KIDNEY; OVARY; FAT BODY; GASTROINTESTINAL TRACT: There is diffuse eosinophilia, loss of differential staining and overgrowth of bacteria (autolysis) of many organs. Adipocytes in the fat body are robust. Few renal tubules contain casts of pale brown material. An ovarian follicle is collapsed, lack yolk protein and is infiltrated by foamy macrophages (follicular atresia/resorption). The intestinal lumen contains many round, ~30-50 um diameter, basophilic single celled organisms with a prominent circular nucleus and nucleolus (suspect protozoa or amoeba).

2. HEAD, EYES, BRAIN, SKELETAL MUSCLE, SKULL: There is diffuse eosinophilia, loss of differential staining and overgrowth of skin by bacteria and fungal-like organisms (autolysis) of most all sections.

3. FEET; HINDLIMB: There is diffuse eosinophilia, loss of differential staining and overgrowth of skin by bacteria and fungal-like organisms (autolysis) of all sections.

MORPHOLOGIC DIAGNOSIS:

1) Advanced autolysis with overgrowth of bacteria and fungal-like hyphae
2) Intestines: Intraluminal single-celled organisms (suspect cilliates or amoeba)

REMARKS: On 3/23/2017 By ANC

3/23/17: There were no histologic lesions to suggest a cause of death; however, considerable postmortem autolysis precluded a more detailed histologic evaluation. Adipocytes within fat bodies were still robust suggesting an acute decline. Intestinal organisms are likely incidental/commensal. Growth of hyphal elements within the skin most likely represents postmortem colonization of water mold (i.e. Saprolegnia sp.) based on the lack of an obvious inflammatory response; however, the possibility of an early antemortem infection cannot be completely ruled out. The condition of the skin did not allow for adequate assessment for chytrid organisms.

Andrew Cartoceti	Andrew Cartoceti	3/23/2017
PROSECTOR	PATHOLOGIST	DATE COMPLETED

Printed on: 3/23/2017 11:52:09 AM CARES-MED v2.119

Pathology Module - Final Pathology Report
NATIONAL ZOOLOGICAL PARK

PATH # N2017-0032

Death Date: 2/21/2017
Necropsy Date: 2/22/2017

ATELOPUS ZETEKI
Panamanian golden frog
Name:

Gender: Unknown Sex
Age:

Accession No.: 307126
Birth:
Acquired: 28 Jun 2005
31 Dec 2016

SEX: Unknown Sex AGE: ADULT WEIGHT: 2.4 gm STAY:

MANNER OF DEATH: Found Dead
TIME OF DEATH: 16:00
DEATH LOCATION: EML 14
SUBMITTOR: Lando McCall
OWNER/ANIMAL DEPT: DOA

INTERVAL: 6-24 hours
XRAYED: False
DISPOSITION: FORMALIN
PROSECTOR: MCP

HISTORY AND CLINCICAL OBSERVATIONS:

KEEPER OBSERVATIONS: On 2/21/2017 By LM

Observed one deceased Panamanian Golden frog in front right water feature of tank EML 14. Recovered and placed in bag. Will go to Pathology in AM. Specimen recovered in good condition. No decay.

CLINICIAN OBSERVATIONS: On By

GROSS DESCRIPTION: On 2/23/2017 By ANC

Received is a 2.4 gram, adult, sex pending histology, Panamanian golden frog for necropsy on 22 February 2017 after being found dead. The carcass is in fair postmortem condition and poor nutritional condition with generalized muscle atrophy (spindly legs, prominent skeletal prominences) and minimal adipose tissue. The coelomic cavity contains abundant brown to red-tinged watery fluid.

GROSS DIAGNOSIS: By ANC

Hemorrhagic coelomic effusion (presumptive)
Poor body condition with minimal adipose stores generalized muscle atrophy

LABORATORY STUDIES:

TISSUE STATUS:

SHELVED:	False
TRIMMED:	True
FROZEN:	False
ULTRAFROZEN:	True

Tissues Ultrafrozen: Liver, foot

SPECIAL REQUESTS: On By

HISTOLOGY: On 3/23/2017 By ANC

1. HEART; LUNG; LIVER; KIDNEY; TESTES; LARYNX; GASTROINTESTINAL TRACT: Many renal tubular epithelial cells contain granular pale brown pigment and glomerular tufts have few melanomacrophages. In the lumen of the intestine (colon?), there are moderate numbers of flagellates and scrolls of epidermis. There is diffuse eosinophilia, loss of differential staining and/or overgrowth of bacteria (autolysis) of the lung, heart, liver, intestine and larynx.
2. HEAD, EYES, BRAIN, SKELETAL MUSCLE, SKULL: WNL.
3. FEET; HINDLIMB: There is diffuse eosinophilia, loss of differential staining and overgrowth of skin by bacteria and fungal-like organisms (autolysis) of some sections.

MORPHOLOGIC DIAGNOSIS:

1) Body as a whole: Poor body condition
2) Intestine: Intraluminal flagellated protozoa

REMARKS: On 3/23/2017 By ANC

3/23/17: There were no histologic lesions to suggest a cause of death or the origin of hemorrhagic coelomic effusion; however, advanced autolysis precluded a more detailed histologic evaluation of several organs as this frog was more decomposed than it appeared grossly. This frog was identified as a male via histology. Intestinal flagellates are likely incidental/commensal. Growth of hyphal elements within the skin most likely represents postmortem colonization of water mold (i.e. Saprolegnia sp.) based on the lack of an obvious inflammatory response; however, the possibility of an early antemortem infection cannot be completely ruled out.

MCP	Andrew Cartoceti	3/23/2017
PROSECTOR	PATHOLOGIST	DATE COMPLETED

Printed on: 3/23/2017 11:48:49 AM CARES-MED v2.119

Pathology Module - Final Pathology Report
NATIONAL ZOOLOGICAL PARK

PATH # N2017-0033

Death Date: 2/23/2017
Necropsy Date: 2/23/2017

FELIS CATUS
Domestic cat (breed unspecified)
Name: Thumbprint

Gender: Male
Age: 15Y 11M 3D

Accession No.: UMBPRI
Birth: 20 Mar 2001
Acquired: 20 Feb 2005
Removed: 23 Feb 2017

SEX: Male
AGE: 15Y 11M 3D
WEIGHT: 5.088 kg
STAY: > 30 Days

MANNER OF DEATH: Euthanasia
TIME OF DEATH:
DEATH LOCATION: Hospital
SUBMITTOR: Diana Boon
OWNER/ANIMAL DEPT: DCM

INTERVAL: 0-6 hours
XRAYED: True
DISPOSITION: INCINERATE
PROSECTOR: Andrew Cartoceti

HISTORY AND CLINCICAL OBSERVATIONS:

KEEPER OBSERVATIONS: On By

CLINICIAN OBSERVATIONS: On 2/23/2017 By DB

Dx with abdominal neoplasia. On prednisone PO for maintenance. Recent slow decline in clinical status. Euthanized.
PM Radiographs indicated increased opacity caudal dorsal lung fields, very enlarged liver.

GROSS DESCRIPTION: On 2/24/2017 By ANC

Received is an adult, male neutered, 5.088 kg, domestic shorthair cat for necropsy on 23 February 2017 following euthanasia. The carcass is in good postmortem condition and good body condition with well-fleshed musculature and abundant subcutaneous and intra-abdominal adipose stores. A green tattoo on the inside of the left pinna reads "C226" and a tattoo on the inside of the right pinna reads "4 (within a circle) 1." There is mild thinning of the fur along the caudolateral portions of the right and left thighs. The ventral thorax and abdomen is shaved with partial regrowth of fur (presumptive ultrasonography).

In the pharynx, just cranial to the arytenoid cartilages, the mucosa is bilaterally thickened and bulges slightly into the pharyngeal lumen (presumed tonsilar lymphoid hyperplasia). The pericardial sac contains slightly increased amounts of watery, clear, pale yellow fluid and small strands of fibrin. On the epicardial surface of the left auricle, there is a ~0.5 cm diameter region of reddening. The lungs are diffusely soft and mottled pink to red.

The liver is 184 grams (with bile) representing 3.6% of body weight. The liver is diffusely red-brown with an enhanced pale tan reticular pattern and small, soft, pale yellow and dark red foci scattered throughout the lobes. At the level of the junction of the common hepatic duct and the cystic duct (beginning of the common bile duct), there is a ~3 x 2 x 2 cm, firm, multinodular, white mass that encompasses and effaces the ducts. Two similar smaller masses expand the parenchyma of the nearby left lateral (~1 cm diameter) and right medial (~0.5 cm diameter) liver lobes. The common hepatic duct, cystic duct and neck of the gallbladder are dilated and tortuous and the gall bladder is distended by gelatinous, dark green bile. Bile cannot be expressed into the duodenal papilla. The adjacent hepatic lymph node is enlarged (~1.5 x 1 x 1 cm). Throughout both lobes of the pancreas, there are are many, up to 1 cm diameter, firm, white nodules (presumed nodular exocrine hyperplasia). At the mid-hilus of the spleen, the adjacent adipose is focally firm and discolored white to yellow-tan. The left adrenal gland has a finely nodular capsular surface that resembles the normal cortical tissue on cut section. The kidneys are small (left more than right), have a bosselated capsular surface and white streaking in the medullas. There is soft, gelatinous, dark red material in the left renal pelvis. The cortex of the right kidney contains few, up to 7 mm diameter cysts filled with clear yellow to pale red, watery fluid. The urinary bladder contains ~15 mL of clear yellow urine with few flecks of clotted blood. The bladder mucosa is 1-2 mm thick and has irregular white streaking.

The molars and premolars have small amounts of calculus. The stomach contains abundant soft kibble and mucus. The small intestine contains small amounts of pasty, pale tan ingesta and the colon contains abundant formed feces.

The brain, pituitary gland, trigeminal nerves, thyroid glands, eyes, trachea, esophagus, diaphragm, stifle joints, gastrointestinal tract, skeletal muscles and right sciatic nerve are grossly unremarkable.

GROSS DIAGNOSIS: By ANC

Bile duct: Cholangiocarcinoma (presumptive) with intrabiliary metastasis (right medial and left lateral liver lobes) and extrahepatic biliary obstruction
Kidneys: Moderate to severe, bilateral, chronic nephropathy (presumptive chronic nephritis) with pelvic hemorrhage (left) and cortical cysts (right)
Lymph node, hepatic: Lymphadenomegaly
Adipose, peripancreatic: Focal adipose necrosis and saponification (presumptive)
Pancreas: Multifocal nodular hyperplasia (presumptive)

LABORATORY STUDIES:

TISSUE STATUS:

SHELVED:	False
TRIMMED:	True
FROZEN:	False
ULTRAFROZEN:	True

Tissues Ultrafrozen: Liver, liver with mass, lung, kidney

SPECIAL REQUESTS: On By

HISTOLOGY: On 4/7/2017 By ANC

1. LUNG: Multifocally, alveolar septa are expanded by fibrin, few neutrophils and macrophages and rare lymphocytes, creating small hypercellular aggregates. The adjacent alveolar lumina contains fibrin, many alveolar macrophages and few neutrophils. Focally, a larger area (up to ~3 mm diameter) of alveoli are affected and there is type II pneumocytes hyperplasia and many foamy macrophages. There are few megakaryocytes. BROWN & HOPPS, WARTHIN STARRY, GIEMSA: Scattered throughout inflamed and normal areas, there are few individualized mixed bacteria within alveolar lumina. FITES ACID FAST, GMS: No acid-fast organisms or fungal elements are evident. PTAH: Minimal fibrin is evident (poor stain quality).

2. ADRENAL GLAND; THYROID GLANDS; PARATHYROID GLANDS; SPLEEN; ADIPOSE; LYMPH NODE, HEPATIC: Many adrenal cortical cells in the glomerulosa and outer fasciculata layers have clear cytoplasmic vacuolation. In both glands, there are nests of cortical cells within and exterior to the adrenal capsule. At the corticomedullary junction of one gland, the cortex is expanded by a large (~3 mm diameter) lake of erythrocytes and fibrin that is circumscribed by a thick rim of lamellar fibrin that is partially mineralized and infiltrated by plump fibroblasts and hemosiderin-laden macrophages. An adjacent blood vessel is surrounded by a lake of serum. In both thyroid lobes, there are scattered cystic follicles. In the spleen, periarteriolar lymphoid sheaths are sparse. There are few megakaryocytes in the red pulp. In the lymph node, expanding and replacing the normal architecture is a densely cellular neoplastic mass composed of elliptical to columnar cells that forms cords lining thin fibrovascular stroma. The mass is partially subdivided by larger fibrous trabeculae. Individual cells are columnar with indistinct cell borders, small amounts of granular eosinophilic cytoplasm and oval to cigar-shaped nucleus with granular chromatin and indistinct nucleoli. Mitotic figures average 3 per 400x field and there is mild anisocytosis and anisokaryosis. Occasionally, neoplastic cells form dense sheets instead of cords. In the adipose, there is multifocal coagulative and lytic necrosis and saponification of hepatocytes. Affected areas are surrounded by many foamy macrophage, fewer multinucleated giant cells and increased fibrous connective tissue.

3. LIVER: The hepatic parenchyma is infiltrated by a neoplastic mass as described above. Neoplastic cells form large nests instead of cords and occasionally surround large sinusoids filled with blood, serum and fibrin. Ito cells are numerous and hepatocytes are occasionally vacuolated (lipid-type). Midzonal sinusoids are mildly dilated and congested. Kupffer cells have golden yellow granular pigment (hemosiderin). In portal tracts there are increased numbers of bile ductules. Larger bile ducts are surrounding by mildly increased amounts of fibrous connective tissue with few infiltrating lymphocytes and plasma cells.

4. LIVER; GALL BLADDER; COMMON BILE DUCT: The muscular layer of the common bile duct is expanded and effaced by a large, densely cellular mass as previously described. In one section of gall bladder, the lumen is filled with mucinous material and the mucosa consists of single layer of proliferating columnar cells that form papillary fronds projecting into the lumen.

5. KIDNEY: In the mid-medulla, there is a band of tubular mineralization. At the corticomedullary junction, tubules are dilated and lined by attenuated epithelium. Throughout the cortex, tubules are dilated and filled with protein. Tubular epithelium is vacuolated. The interstitium is infiltrated by many aggregates of lymphocytes, plasma cells, macrophages and fewer neutrophils. There is peritubular and periglomerular fibrosis and the capsular surface is undulating.

6. HEART, LEFT AURICLE, LEFT PAPILLARY, RIGHT ATRIUM AND VENTRICLE: In the left auricle, there is regional epicardial hemorrhage and multifocal myocardial interstitial hemorrhage with few hemosiderin laden macrophages.

7. ESOPHAGUS; STOMACH; DUODENUM; TRACHEA: WNL.

8. DUODENUM; PANCREAS; JEJUNUM: In the pancreas, there are many hyperplastic nodules of exocrine cells that have slightly more pale tinctorial properties than surrounding glands. Few lymphocytes are scattered throughout exocrine glands. In the peripancreatic fat, there is multifocal necrosis and infiltration by neutrophils and macrophages.

9. ILEUM; CECUM; COLON; URINARY BLADDER: WNL.

10. BRAIN, CEREBRUM: WNL.

11. BRAIN, CEREBRUM, THALAMUS: WNL.

12. BRAIN, CEREBRUM, HIPPOCAMPUS: Focally at the junction of the hippocampus and the cerebrum, the neuropil is vacuolated and infiltrated by pigment-laden macrophages and gemistocytic astrocytes.

13. BRAIN, MIDBRAIN, CEREBELLUM: WNL.

14. BRAIN, CEREBELLUM, BRAINSTEM: In the grey matter of the brainstem, few blood vessels are cuffed by lymphocytes.

MORPHOLOGIC DIAGNOSIS:

1) Liver, gall bladder, hepatic lymph node: Neuroendocrine carcinoma
2) Kidneys: Moderate, multifocal, chronic, interstitial nephritis with interstiial fibrosis and tubular proteinosis, ectasia and mineralization
3) Gallbladder: Mucocele
4) Adipose: Moderate, chronic, granulomatous and necrotizing steatitis with saponification and fibrosis
5) Lung: Moderate, multifocal, subacute, neutrophilic, histiocytic and fibrinous interstitial pneumonia with alveolar histiocytosis
6) Brain: Mild, focal, chronic encephalomalacia with astrogliosis and hemosiderosis
7) Brain: Mild, focal, chronic, lymphocytic encephalitis
8) Liver: Mild, multifocal, chronic, lymphoplasmacytic portal hepatitis with mild biliary hyperplasia and peribiliary fibrosis
9) Heart, left auricle: Mild, multifocal, subacute, epicardial and myocardial hemorrhage
10) Adrenal gland: Focal, subacute, cortical hemorrhage

REMARKS: On 4/7/2017 By ANC

4/7/17: Histology revealed the gall bladder tumor to be a neuroendocrine carcinoma. Based on the size and location of tumors, it appears the neoplasm arose in the wall of the common bile duct and metastasized to the liver and hepatic lymph node. Gallbladder mucocele formation is presumably secondary to the compressive effect of the bile duct tumor, as this is known to occur in humans. Chronic nephritis and steatitis with saponification were also confirmed. Hemorrhages in the adrenal gland and heart as well as focal encephalomalacia (which is suggestive of a prior hemorrhage) may be due to a coagulopathy related to chronic renal disease (i.e. antithrombin-losing nephropathy). Interstitial pneumonia, consistent with the radiographic findings, does not have a clear etiology but appears to be oriented towards pulmonary capillaries and may also be related to coagulopathy. Extensive special staining of the lungs for infectious agents revealed only mixed bacteria within both affected and non-affected regions; based on the morphology and distribution of bacteria and nature of inflammation, bacteria are interpreted as postmortem contaminants/overgrowth. The remaining lesions are considered mild and less clinically significant.

Andrew Cartoceti	Andrew Cartoceti	4/7/2017
PROSECTOR	PATHOLOGIST	DATE COMPLETED

Printed on: 4/7/2017 10:22:46 AM CARES-MED v2.119

Pathology Module - Final Pathology Report
NATIONAL ZOOLOGICAL PARK

PATH # N2017-0038

Death Date: 3/6/2017
Necropsy Date: 3/6/2017

PYGOCENTRUS NATTERERI
Red piranha
Name:

Gender: Unknown Sex
Age:

Accession No.: 500806
Birth:
Acquired: 12 Dec 2013

SEX: Unknown Sex AGE: ADULT WEIGHT: 965 gm STAY: > 30 Days

MANNER OF DEATH: Euthanasia
TIME OF DEATH: 13::30
DEATH LOCATION: Amazonia
SUBMITTOR: KB
OWNER/ANIMAL DEPT: DOA

INTERVAL: 0-6 hours
XRAYED: False
DISPOSITION: INCINERATE
PROSECTOR: MCP

HISTORY AND CLINCICAL OBSERVATIONS:

KEEPER OBSERVATIONS: On By

CLINICIAN OBSERVATIONS: On 3/6/2017 By KB

This animal had a 2-3 day history of appearing more pale than tank mates and having an intermittently elevated respiratory rate. On visual exam today, this animal was diffusely more pale than other tank mates, had an elevated respiratory rate, and had a mildly distended coelom. On catch-up and on restraint for diagnostic tests, this animal was noted to be markedly lethargic and began to have buoyancy abnormalities following restraint. Skin scrape and gill clip were negative for parasites. Due to poor prognosis, euthanasia was elected. Euthanasia was performed with an overdose of a buffered MS-222 bath.

GROSS DESCRIPTION: On 3/7/2017 By MCP

An adult, female, 965 g, 27 cm long (full length, 25 cm fork length) and 15 cm in girth, Red-bellied Piranha is necropsied on 6 March 2017 following euthanasia. There is minimal autolysis, with abundant adipose tissue and adequate musculature.

All organs and tissues examined are grossly within normal limits.

GROSS DIAGNOSIS: By MCP

1. Whole body: Minimal autolysis

LABORATORY STUDIES:

TISSUE STATUS:

SHELVED:	False
TRIMMED:	True
FROZEN:	False
ULTRAFROZEN:	True

Tissues Ultrafrozen: Liver and kidney

SPECIAL REQUESTS: On By

HISTOLOGY: On 10/5/2017 By ANC

1. HEART
2. GILL
3. LIVER
4. ANTERIOR KIDNEY; OVARY
5. ANUS
6. SPLEEN; SWIM BLADDER; ADIPOSE
7. GASTROINTESTINAL TRACT
8. GASTROINTESTINAL TRACT
9. SPINE; POSTERIOR KIDNEY
10. SPINE; POSTERIOR KIDNEY
11. EYES
12. EYES
13. EYES; ROSTRUM; JAW
14. OLFACTORY ORGAN
15. JAW
16. CRANIUM; BRAIN

SPECIAL STAINS
9. Ziehl-Neelsen Acid Fast: Acid-fast organisms are not evident within granulomas.

MORPHOLOGIC DIAGNOSIS:

1) Kidney, spleen, adipose: Granulomatosis
2) Gill: Moderate, diffuse chronic, branchitis with lamellar fusion, atrophy and necrosis
3) Heart: Mild, multifocal, chronic-active, myocarditis with myocyte loss and replacement fibrosis
4) Ovary: Multiple atretic follicles and mild, chronic, lymphohistiocytic and granulocytic oophoritis
5) Liver: Diffuse hepatocellular cytoplasmic protein inclusions
6) Adipose (mesenteric, bone marrow, head): Multiple chronic granulomas with central amorphous, refractile material
7) Olfactory organ: Regionally extensive, acute hemorrhage (presumed perimortem)
8) Bone marrow (maxilla): Mild, multifocal, chronic, lymphocytic myelitis with protein exudation

REMARKS: On 10/5/2017 By ANC

10/5/17: Granulomatous disease in the kidney and spleen are suggestive of chronic mycobacteriosis; however, acid-fast organisms were not evident on special staining (not uncommon in chronic mycobacteriosis). An unexpected histologic finding was chronic bronchitis, consistent with the clinical sign of increased respiratory rate. Although this is a non-specific finding, gill parasitism (no parasites seen histologically) and water quality are commonly implicated causes. Cardiac lesions are indicative of chronic and ongoing damage to the myocardium, the cause of which is not evident. The presence of atretic follicles and mild inflammation in the ovary suggests that the abundance of ovarian follicles could be indicative of egg binding, although there was no evidence of any active yolk coelomitis. The remaining findings are considered mild and/or incidental.

MCP	Andrew Cartoceti	10/5/2017
PROSECTOR	PATHOLOGIST	DATE COMPLETED

Printed on: 10/5/2017 1:49:28 PM CARES-MED v2.119

Pathology Module - Final Pathology Report
NATIONAL ZOOLOGICAL PARK

PATH # N2017-0039

Death Date: 3/7/2017
Necropsy Date: 3/8/2017

LITORIA CAERULEA
White's tree frog
Name:

Gender: Unknown Sex
Age:

Accession No.: 307065
Birth:
Acquired: 29 Apr 2004

SEX: Unknown Sex AGE: ADULT WEIGHT: 53 gm STAY: > 30 Days

MANNER OF DEATH: Euthanasia
TIME OF DEATH: 16::30
DEATH LOCATION: WHS
SUBMITTOR: KLH
OWNER/ANIMAL DEPT: DOH

INTERVAL: 6-24 hours
XRAYED: False
DISPOSITION: ALL IN FORMALIN
PROSECTOR: MCP

HISTORY AND CLINCICAL OBSERVATIONS:

KEEPER OBSERVATIONS: On By

CLINICIAN OBSERVATIONS: On 3/7/2017 By KLH

Proc: Euthanasia
Frog presented late in afternoon after being found upside down in tank, failure of righting reflex, and increased skin secretions. prior history of cloacal prolapses, and possibly ocular disease. Animal is 21 years old.
On exam, the right lower eyelid is protracted over the eye, but the eye itself appears WNL. Animal is minimally responsive, and had slight escape reflex on back but did not right itself. front right foot was curled weakly and frog was not placing digits normally with front feet. Discussed with assistant curator that we could try antibiotics, calcium, ringers. Given animal's age and acute presentation of metabolic and/or neurologic disease, with longer history of additional medical concerns, humane euthanasia was elected.
Animal was euthanized in buffered MS-222. After ~15 minutes, intracoelomic and intracardiac MS-222 administered as well. Cardiac arrest confirmed and submitted for necropsy.

GROSS DESCRIPTION: On 3/8/2017 By MCP

An adult, male, 53 g, White's Tree Frog is necropsied on 8 March 2017 following euthanasia. There is moderate autolysis with minimal adipose tissue (small fat bodies) and adequate musculature. The left eye is slightly less prominent (sunken) than the right eye.

There is a 5 x 4 x 4 mm, white, multinodular mass located in the mesentery of the duodenum. The left kidney contains a 2 mm in diameter, white nodule.

All other organs and tissues examined are grossly within normal limits.

GROSS DIAGNOSIS: By MCP

1. Kidney: Neoplasia vs focal granuloma
2. Coelomic mass: Neoplasia vs focal granuloma vs pancreatic hyperplasia

LABORATORY STUDIES:

TISSUE STATUS:

SHELVED:	False
TRIMMED:	False
FROZEN:	False
ULTRAFROZEN:	True

Tissues Ultrafrozen: Liver, kidney, periduodenal mass.

SPECIAL REQUESTS: On By

HISTOLOGY: On 9/13/2017 By ANC

1. HEART; LIVER; GALLBLADDER
2. KIDNEY; ADRENAL; FAT BODY; TESTIS
3. LUNG
4. DIGESTIVE TRACT
5. HEAD, NASAL CAVITY, EYE
6. HEAD; EYE, BRAIN
7. HEAD; SPINAL COLUMN

MORPHOLOGIC DIAGNOSIS:

1) Kidney: Severe, diffuse, chronic, lymphoplasmacytic interstitial nephritis with interstitial fibrosis, tubular ectasia with protein and cellular casts
2) Heart, liver, intestine: Moderate, multifocal, chronic, lymphohistiocytic and granulocytic serositis/coelomitis with fibrin exudation and fibroplasia
3) Ureter: Moderate, diffuse, chronic, lymphocytic ureteritis with intraluminal bacteria
4) Cloaca: Moderate, diffuse, chronic, neutrophilic and lymphohistiocytic cloacitis
5) Eye: Mild, multifocal, chronic, lymphoplasmacytic, conjunctivitis
6) Liver: Melanomacrophage hyperplasia
7) Fat body: Diffuse adipose atrophy
8) Testis: Spermatogenesis

REMARKS: On 9/19/2017 By ANC

9/19/17: The most significant finding in this frog is urinary tract disease consisting of renal inflammation that is at or approaching end-stage disease and an ascending bacterial infection of the ureter. Serositis may be due to extension of bacterial infection into the coelomic cavity and/or coelomic effusion related to altered renal fluid metabolism, although coelomic fluid was not noted at the time of necropsy. The renal mass seen grossly is due to a region of marked inflammation and does not represent neoplasia Two small foci of chronic inflammation were present in the palpebral conjunctiva of one eye. An etiology is not evident, but discomfort associated with this inflammation may be the cause for the reported blepharospasm/enophthalmos.

MCP	CARTOCETI	9/19/2017
PROSECTOR	PATHOLOGIST	DATE COMPLETED

Printed on: 9/19/2017 10:34:52 AM CARES-MED v2.119

Pathology Module - Final Pathology Report
NATIONAL ZOOLOGICAL PARK

PATH # N2017-0041

Death Date: 3/12/2017
Necropsy Date: 3/13/2017

GEOTHLYPIS TRICHAS
Common yellowthroat
Name:

Gender: Female
Age: 0Y 8M 25D

Accession No.: 216547
Birth: 15 Jun 2016
Acquired: 13 Sep 2016
Removed: 12 Mar 2017

SEX: Female AGE: 0Y 8M 25D WEIGHT: 7.1 gm STAY: > 30 Days

MANNER OF DEATH: Found Dead
TIME OF DEATH: 14:55
DEATH LOCATION: BH10
SUBMITTOR: Jordana Todd
OWNER/ANIMAL DEPT: DOO

INTERVAL: 6-24 hours
XRAYED: False
DISPOSITION: FORMALIN
PROSECTOR: Andrew Cartoceti

HISTORY AND CLINCICAL OBSERVATIONS:

KEEPER OBSERVATIONS: On 3/12/2017 By JT

Found dead in BH10 during PM feeds. She had been hospitalized the night before for a chronic health condition that worsened. She was put on oxygen and returned to BH this afternoon. She was found dead in exhibit a few hours later. Indoor exhibit with 1.0 ovenbird and one other 1.0 common yellowthroat.

CLINICIAN OBSERVATIONS: On By

GROSS DESCRIPTION: On 3/13/2017 By ANC

Received is 7.1 gram, adult, female Common yellowthroat for necropsy on 13 March 2017 after being found dead. The carcass is in good postmortem condition and fair nutritional state with well-fleshed pectoral muscles but minimal subcutaneous or intra-coelomic adipose stores. There is urate staining in the feathers surrounding the vent. The air sacs are thin and transparent and the lungs are soft, pink and float in formalin. The small intestine and colon are filled with pale to dark brown, pasty ingesta. The brain, eyes, oral cavity, trachea, esophagus, proventriculus, ventriculus, spleen, liver, kidneys, adrenal glands and ovary are grossly unremarkable.

GROSS DIAGNOSIS: By ANC

Fair body condition with minimal adipose stores

LABORATORY STUDIES:

TISSUE STATUS:

SHELVED:	False
TRIMMED:	True
FROZEN:	False
ULTRAFROZEN:	True

Tissues Ultrafrozen: Lung, liver, kidney

SPECIAL REQUESTS: On By

HISTOLOGY: On 4/6/2017 By ANC

1. LIVER; SPLEEN; KIDNEY; ADRENAL; OVARY; LUNG: Microfilaria are present in the peripheral blood of the liver, lung and kidney.

2. BRAIN: WNL.

3. TRACHEA; ESOPHAGUS; SMALL INTESTINE; LARGE INTESTINE; CLOACA: Serosal adipocytes are atrophic.

4. HEART; PROVENTRICULUS; VENTRICULUS: Epicardial adipocytes are atrophic.

5. HEAD, EYES, NASAL CAVITY: The palatine mucous glands and glands lateral to the nasal cavity (presumed lacrimal?) are bilaterally dilated, filled with lamellar keratin and lined by stratified squamous epithelium. The subepithelial stroma surrounding ducts is diffusely infiltrated by few heterophils, lymphocytes and plasma cells, and focally by macrophages and multinucleate giant cells that surround free lamellar keratin.

MORPHOLOGIC DIAGNOSIS:

1) Palatine/nasal mucous glands: Moderate, diffuse, chronic squamous metaplasia and hyperkeratosis with focal rupture and granulomatous periadenitis
2) Peripheral blood: Microfilariasis

REMARKS: On 4/18/2017 By ANC

4/18/17 (ADDENDUM): There was an insufficient amount of liver to perform vitamin A analysis. This concludes all diagnostic testing.

4/10/17: Histology revealed squamous metaplasia and impaction of the mucous glands and lacrimal ducts surrounding the nasal cavity, which is presumed to be the cause of this bird's head flicking behavior. Squamous metaplasia can be caused by hypovitaminosis A or any process resulting in irritation to the normal glandular epithelium (inflammation, infection, repeated trauma, etc). The glands/ducts do not appear to be infected and periductal inflammation is likely secondary to rupture of an obstructed duct. Squamous metaplasia was not observed in other locations. Vitamin A analysis of the liver is being pursued. Microfilariasis is likely incidental.

Andrew Cartoceti	Andrew Cartoceti	4/18/2017
PROSECTOR	PATHOLOGIST	DATE COMPLETED

Pathology Module - Final Pathology Report
NATIONAL ZOOLOGICAL PARK

PATH # N2017-0042

Death Date: 3/13/2017
Necropsy Date: 3/13/2017

LANIUS LUDOVICIANUS MIGRANS
Loggerhead shrike
Name:

Gender: Female
Age: 5Y 8M 6D

Accession No.: 216036
Birth: 07 Jul 2011
Acquired: 16 Dec 2011
Removed: 13 Mar 2017

SEX: Female AGE: 5Y 8M 6D WEIGHT: 50 gm STAY: > 30 Days

MANNER OF DEATH: Found Dead
TIME OF DEATH: 07:40A
DEATH LOCATION: SAF
SUBMITTOR: Diana Boon
OWNER/ANIMAL DEPT: DCM

INTERVAL: 0-6 hours
XRAYED: False
DISPOSITION: SCBI
PROSECTOR: Diana Boon

HISTORY AND CLINCICAL OBSERVATIONS:

KEEPER OBSERVATIONS: On 3/13/2017 By CC

-Housed outdoors adjacent to 1.0 loggerhead shrike (216279) at time of death but was with male in pens S-A and S-B from 3/7/17 until 3/11/17. Separated on 3/11/17 at onset of illness. Nest building had been noted prior to separation.
-Weather cold (low of 21 degrees F overnight).
-Found lying sternal on the ground under favored perch in back of the pen. No obvious trauma and no rigor present yet.

-On 3/11/17 bird displayed neurological symptoms at PM check. Landed on a perch upside down with wings out and then flew into the walls and landed on the ground. Did not appear that she could keep her head steady. Caught and taken to hospital. Bird was not very responsive to having its feet touched and had a weak grip. Vocalization slightly weak/raspy. Vet staff administered Baytril and fluids and immediately placed in high oxygen isolette.

-On 3/12/17 behaved more lively in AM, bit keeper and demonstrated a stronger grip. More vocal. Felt thin; weighed 49g. Previous weight on 17 Feb was 53g. Vent still looked clean. Did not appear that she ate anything overnight. AM Exam: Given fluids and Baytril injection. Force fed 3 pieces of chopped pinkie w/ Itraconazole. PM Exam: force fed 4 pieces of choppied pinkie w/ Itraconazole. Returned to home enclosure (S-B) and closed howdy window so that there was no access to mate in S-A.

CLINICIAN OBSERVATIONS: On 3/13/2017 By DB

Patient presented as emergency neurological on 11 Mar 2017. She was unable to perch, fly, grip or posture correctly and showed an intermittent head tilt. Transferred to hospital and provided emergency supportive care (oxygen, fluids, enrofloxacin) and allowed to stay in isolette. Clinical status improved overnight with improved perching. Started oral itraconazole, force feeding, meloxicam and continued enrofloxacin, SQ fluids, and oxygen therapy. Based on temperment of species, elected to return her to enclosure but separated from male. She was force fed prior to move and had access to heat lamp and nest box. Found frozen on ground at AM check (cold overnight ambient temperatures).

Pired with male 216279, who lost two paired females during last year's breeding season (216034 - severe aspergillosis and 216372 - egg yolk coelomitis with pulmonary hemorrhage.)

Birds were starting to nest build. No aggression noted between pair and animal care noted that very soon after introduced, the male was offering food and showing appropriate feeding behaviors.

GROSS DESCRIPTION: On 3/13/2017 By DB

External exam: no wounds identified, feathers & skin good condition. Tag/Band: metal 2491-02409 left leg.
Internal exam: unable to determine if small amount of free fluid present due to carcass being frozen, no areas of pooled fluid or blood, no masses, air sacs appear clear. Intracoelomic fat present as well as SQ fat in neck.

Heart / great vessels: No gross lesions, did not incise the heart. Veins appear to have large clots around heart base and within pulmonary parenchyma.
Lungs: pink, inflated, no lesions detected.
Liver: ventral portion very friable (thawing quickly), no lesions detected.
GI tract: no gross lesions, ice crystals within cloaca
Kidneys: dark red, no lesions detected.
Ovary: follicular development, no indication of trauma to oviduct
Spleen: appears slightly enlarged and elongated, dark red
Eyes: frozen, no lesions noted pre-mortem
Skull: hemorrhage present over skull caudal dorsal left side, two circular focal areas just off midline left side ~2mm diameter each, approx. 3mm apart, no fracture appreciated
Neuromuscular: no gross lesions

GROSS DIAGNOSIS: By DB

Focal hemorrhage, occipital skull

LABORATORY STUDIES:
CULTURE: Antemortem choanal swab

TISSUE STATUS:

SHELVED:	False
TRIMMED:	True
FROZEN:	False
ULTRAFROZEN:	True

Tissues Ultrafrozen: Liver, lung, kidney

SPECIAL REQUESTS: On By

HISTOLOGY: On 4/21/2017 By ANC

1. LUNG; LIVER; SPLEEN; KIDNEY: Portal tracts are often infiltrated by lymphocytes and plasma cells. Focally, there is an aggregate of pulmonary mineralization.

2. HEART; SKELETAL MUSCLE: Epicardial adipocytes are robust.

3. TRACHEA; ESOPHAGUS; PROVENTRICULUS; VENTRICULUS: WNL.

4. SMALL INTESTINE; PANCREAS; LARGE INTESTINE; OVARY: There is normal follicular development in the ovary.

5. BRAIN: WNL.

6. HEAD, EYES: Bilaterally and multifocally, small to moderate numbers of granulocytes (presumptive heterophils) infiltrate the palpebral and bulbar conjunctival epithelium and underlying stroma, especially in the inferior/ventral fornices.

MORPHOLOGIC DIAGNOSIS:

1) Skull, occipital: Mild, focal, acute hemorrhage (gross diagnosis)
2) Conjuctiva, OU: Mild, multifocal, acute, heterophilic conjunctivitis
3) Liver: Minimal, multifocal, chronic, lymphoplasmacytic portal hepatitis

REMARKS: On 4/21/2017 By ANC

4/21/17: In the absence of other significant histologic findings, acute head trauma remains the presumptive cause of calvarial hemorrhage, neurologic signs and death. Possible causes of mild conjunctivitis include mechanical or chemical irritation or early infection, although microorganisms were not evident on H&E stains. The nature of conjunctivitis (heterophilic) is not typical of mycoplasmosis. There was no evidence of squamous metaplasia in the glandular/ductular epithelium of oral and nasal cavities as has been noted in other shrikes from this collection.

Diana Boon	Andrew Cartoceti	4/21/2017
PROSECTOR	PATHOLOGIST	DATE COMPLETED

Pathology Module - Final Pathology Report
NATIONAL ZOOLOGICAL PARK

PATH # N2017-0043

Death Date: 3/15/2017
Necropsy Date: 3/15/2017

MUSTELA NIGRIPES
Black-footed ferret
Name: Dusty

Gender: Male
Age: 6Y 9M 13D
Chip: 041-005-363

Accession No.: 114743
Birth: 02 Jun 2010
Acquired: 18 Jul 2014
Removed: 15 Mar 2017

SEX: Male AGE: 6Y 9M 13D WEIGHT: 775.5 gm STAY: > 30 Days

MANNER OF DEATH:Euthanasia
TIME OF DEATH:08:00A
DEATH LOCATION:Whs
SUBMITTOR:KLK
OWNER/ANIMAL DEPT:DOM - SMH

INTERVAL:0-6 hours
XRAYED:False
DISPOSITION:FROZEN
PROSECTOR:Andrew Cartoeti

HISTORY AND CLINCICAL OBSERVATIONS:

KEEPER OBSERVATIONS: On By

CLINICIAN OBSERVATIONS: On 3/15/2017 By KLH

History of polydipsia with mildly increased liver enzymes, treated with denamarin.
3/7: exam at FHA for abdominal ultrasound and blood work and urinalysis. Ultrasound noted hepatic cyst and a small cyst in the mesentery of the right upper quadrant. Blood work was WNL. UA indicated some casts and bacteria in urine--cultured enterococcus.
3/10: Animal presented with 3-day history of anorexia and hiding since exam. Dehydrated with moderate azotemia and isosthenuria, hyponatremia, relative neutrophilia, mild anemia, pyuria and bacteriuria. Treated with fluids, antibiotics, antinausea, iron dextran, appetite stimulants
3/13: repeat exam showed improved kidney values, electrolytes, and PCV, but moderate to severe elevations in liver enzymes and total bilirubin, and ongoing isosthenuria. Additionally, ascites and a small amount of pleural effusion noted. Metronidazole and additional feeding strategies were employed along with ongoing treatments, but animal continued to decline.
3/15: collected repeat blood and urine samples (in house tests, urine culture, and bank), repeated abdominal ultrasound (prominent gall bladder and small amount of persistent ascites in upper left quadrant), and euthanized with 1ml euthasol IV via left jugular vein. Post mortem rads indicate worsening pleural effusion (mild-moderate), and enlarged pericardial silhouette (r/o pericardial effusion)

GROSS DESCRIPTION: On 3/16/2017 By ANC

Received is a 775.5 gram, adult, neutered male, black-footed ferret for necropsy on 15 March 2017 following euthanasia. A subcutaneous transponder reads "041-005-363." The carcass is in good postmortem condition and good body condition with adequate subcutaneous and intra-abdominal adipose stores. Several proximal coccygeal vertebrae are fused at an acute angle, giving the tail a kinked posture. There is suffusive hemorrhage in the subcutis along the ventral neck (euthanasia artifact) and left flank/lumbar region (fluid administration). The footpads are mildly thickened with dry, pale brown, fine papillary projections. A front and hind footpad and the surrounding fur are gold stained.

The mucus membranes, sclera, footpads and subcutis are yellowed. The pleural and peritoneal cavities have mildly increased (~1 ml), clear, yellow fluid and rare strands of fibrin. The lungs are soft, pink and float in formalin. In the epicardial surface of the left ventricular free wall, there is a ~3 x 5 mm focus of pale yellow discoloration. In the septal leaflet of the mitral valve, there is a ~3 mm diameter, pale yellow, soft nodule. The stomach is empty, the small intestines contain scant watery pale yellow fluid and the colon contains pasty brown-green feces. The vasculature of the intestinal tract, gall bladder and urinary bladder is injected. In the mesenteric serosa of duodenum, there is a 4 mm diameter, cyst filled with clear watery fluid. At the angle of the gastric and duodenal limbs of the pancreas, there are two ~7 mm diameter, red nodules with a finely granular/nodular surface (presumed pancreatic hyperplasia). The liver is dark red with subtle areas of more pale red mottling. Within the caudate lobe and right lateral lobe, there is a 2 mm diameter cyst filled with pale yellow watery fluid. The gallbladder, cystic duct, hepatic duct and common bile duct are filled with friable, semi-solid, dark green bile which cannot be express through the duodenal papilla. The bile ducts are dilated up to 4 mm in diameter and the walls of the ducts and gallbladder are thickened (1-2 mm thick). The parenchyma of both kidneys is yellow tinged. In the cortex of the left kidney, there are two stellate, ~5 mm diameter, dark red, capsular depressions that extend to the corticomedullary junction (chronic infarcts). On cut section, there is red mottling in the cortices, and white-yellow streaking in the medulla of both kidneys. The urinary bladder contains ~10 ml of clear, dark yellow urine.

The left maxillary canine tooth is fractured and has a blunt end. The right maxillary canine tooth is absent (previous extraction). There is moderate wear and mild calculus on most teeth.

GROSS DIAGNOSIS: By ANC

Gall bladder, bile ducts: Cholecystitis and choledochitis (presumptive) with cholestasis
Body as a whole: Jaundice
Pleural, peritoneal cavities: Effusion
Kidney: Bilateral nephropathy (presumptive nephritis) with chronic infarcts (left only)
Pancreas: Multiple masses (presumptive exocrine hyperplasia)
Liver, right lateral, caudate lobes: Multiple cysts

Mitral valve: Focal mass (fibrin thrombus vs. endocardiosis vs. endocarditis)
Duodenum: Focal cyst
Footpads: Hyperkeratosis
Teeth: Attrition with moderate wear and mild dental calculus

LABORATORY STUDIES:
CULTURE: Liver, bile
OTHER: musle tendon and trachea for cytogenetics

TISSUE STATUS:

SHELVED:	False
TRIMMED:	True
FROZEN:	False
ULTRAFROZEN:	True

Tissues Ultrafrozen: liver (2), kidney. foot, lung, spleen, colon, urine, bile

SPECIAL REQUESTS: On By

HISTOLOGY: On 4/18/2017 By ANC

1. KIDNEY, LEFT: Focally, there is a capsular depression and the corresponding cortex consists of condensed, shrunken, sclerotic glomeruli surrounded by fibrous connective tissue (chronic infarct). Many tubules are dilated, lined by attenuated epithelium and filled with proteinaceous fluid. Moderate numbers of neutrophils infiltrate the renal papilla, renal interstitium and tubule walls (medulla>cortex), which are often degenerate or necrotic and contain casts of sloughed cells and neutrophils. There is scattered interstitial hemorrhage and infiltration of few lymphocytes and plasma cells. Most glomeruli have moderately increased amounts of homogeneous eosinophilic matrix material. BROWN & HOPPS, WARTHIN STARRY: No bacteria are evident. CONGO RED: Thickened mesangium is congophilic but not birefringent. TRICHROME, PAS, PAMS: There is mild thickening of glomerular mesangium, but no spike, holes or splitting of the basement membranes to suggest immunoglobulin deposition.

2. KIDNEY, RIGHT; LIVER: The kidney is inflamed as previously described. In the liver, large bile ducts are dilated, filled with bile and proteinaceous fluid and surrounded by edema. The biliary epithelium is multifocally necrotic or regenerating and smaller ducts often contain neutrophils and fewer macrophages, streaming nuclear debris and small colonies of bacteria. Portal tracts are often infiltrated by few neutrophils (especially around affected bile ductules), lymphocytes, plasma cells, hematopoietic precursor cells and few megakaryocytes (extramedullary hematopoiesis). Sinusoids are congested and hepatocytes are small. Ito cells are numerous.

3. LIVER; BILE DUCTS; GALLBLADDER; PANCREAS; DUODENUM; LYMPH NODE, HEPATIC: The liver is inflamed as previously described. The adipose and connective tissue surrounding extrahepatic bile ducts is expanded by hemorrhage, proteinaceous fluid, few neutrophils and plump spindloid cells. Focally, there is an aggregate of hemosiderin laden macrophages. The wall of the gallbladder and extrahepatic bile ducts are infiltrated by neutrophils, necrotic cellular debris and hemorrhage and the mucosal epithelium is multifocally absent (necrotic). The lumen is filled with erythrocytes, fibrin, fewer neutrophils and bile. Few duodenal crypts are dilated, filled with degenerate neutrophils and lined by attenuated enterocytes. BROWN & HOPPS: There are rare Gram-positive cocci within affected bile duct lumina.

4. HEART, LEFT ATRIUM, MITRAL VALVE, LEFT VENTRICLE: Adhered to the mitral valve leaflet is a large coagulum of fibrin with embedded erythrocytes, neutrophils and colonies of cocci. The base of the leaflet is infiltrated by neutrophils, plump spindloid cells and fewer macrophages and lymphocytes. Focally in the left ventricle, a group of myofibers is necrotic and few macrophages infiltrate the interstitium. BROWN & HOPPS: Bacteria within the coagulum are predominantly individualized Gram-positive cocci.

5. LUNG: WNL.

6. LIVER; SPLEEN: The liver is inflamed as previously described. There is trilineage development of hematopoietic cells in the splenic red pulp.

7. HEART, RIGHT ATRIUM AND VENTRICLE, INTERVENTRICULAR SEPTUM: WNL.

8. ADRENAL; THYROID; PANCREAS; DUODENUM; LYMPH NODES, PERIPANCREATIC: In the adrenal sinusoids, there are scattered hematopoietic cells. Along the mesenteric serosa of the duodenum, there is a cyst lined by simple cuboidal ciliated epithelium and a thin fibrous connective tissue wall. Lymph node sinuses are cystically dilated and contain proteinaceous fluid, polymerized fibrin and erythrocytes mixed with lymphoid cells. Medullary sinuses contain extramedullary hematopoiesis.

9. URINARY BLADDER; TRACHEA; ESOPHAGUS: WNL.

10. STOMACH: In the cardia and fundus, many gastric glands are dilated and filled with proteinaceous fluid while others are lined by variably disorganized, attenuated, degenerate or hyperplastic epithelium. Rarely, there is nesting of glands surrounded by a thin rim of fibrous connective tissue. Scattered lymphocytes infiltrate the lamina propria and muscularis mucosa, often forming nodular aggregates. WARTHIN STARRY: Spiral bacteria are not evident.

11. FOOTPADS: Multifocally, there is excess basophilic to eosinophilic, lamellar, anucleate keratin that lines the surface of epidermal papilla and fills and dilates the infundibula of compound hair follicles.

12. SMALL INTESTINE; LARGE INTESTINE: Serosal blood vessels are often congested.

13. BRAIN, CEREBRUM, THALAMUS: Multifocally, there is discrete, clear vacuolation of the neuropil along the deep aspect of the cortical grey matter.

14. BRAIN, CEREBRUM, THALAMUS, MIDBRAIN: Multifocally, there is discrete, clear vacuolation of the neuropil along the deep aspect of the cortical grey matter. A small blood vessel within the cortical white matter is occluded by a fibrin thrombus with embedded neutrophils and karyorrhectic debris.

15. BRAIN, CEREBELLUM, BRAINSTEM: Multifocally in the white matter of the cerebellum, there is mineralization of the blood vessel walls as well as nodular aggregates of mineral in the surrounding neuropil. Few pigment-laden macrophages surround some affected vessels.

MORPHOLOGIC DIAGNOSIS:

1) Heart, mitral valve: Severe, focally extensive, subacute, suppurative endocarditis with intralesional coccoid bacteria
2) Gallbladder, extrahepatic bile ducts: Severe, diffuse, subacute, hemorrhagic and suppurative cholecystitis and cholangitis
3) Liver: Moderate, diffuse, acute, necrosuppurative cholangiolitis with intrabiliary bacteria
4) Kidneys: Moderate, multifocal, acute, suppurative tubulointerstitial nephritis with tubular degeneration, regeneration, necrosis and ectasia
5) Stomach: Moderate, diffuse, chronic, lymphoplasmacytic gastritis with gland ectasia, necrosis and regeneration
6) Heart: Focal, acute myocardial necrosis
7) Brain: Focal vascular thrombus
8) Duodenum: Mild, multifocal, acute, necrotizing enteritis
9) Kidney: Diffuse, global mesangial glomerulopathy
10) Kidney (left): Multifocal, chronic, cortical atrophy and fibrosis (chronic infarcts)
11) Brain: Mild, laminar, cerebral cortical vacuolation
12) Liver: Mild, diffuse, chronic portal hepatitis and extramedullary hematopoiesis
13) Duodenum: Focal serosal cyst
14) Footpads: Mild, multifocal, orthokeratotic hyperkeratosis

REMARKS: On 4/18/2017 By ANC

4/18/17: Histology confirmed endocarditis, cholangiohepatitis and cholecystitis due to infection with a Gram-positive coccoid bacteria. Culture of the bile and liver yielded no growth, but infection with Enterococcus faecalis (previously cultured from the urine) is possible. The site of initial infection is unclear; however, the distribution of inflammation within the kidneys is not suggestive of ascending pyelonephritis. A primary bacterial endocarditis or cholangitis progressing to sepsis is more likely. Myocardial necrosis, vascular thrombosis in the brain, necrotizing duodenitis and suppurative tubulointerstitial nephritis are likely sequelae of disseminated bacterial infection and sepsis, although bacteria could not be demonstrated in the kidneys on special stains. Mesangial glomerulopathy is similar to that seen in other animals from the Rock Creek and Front Royal collections; further work-up for antibody deposition disorders requires transmission electron microscopy. Gastritis is reminiscent of Helicobacter infection; however spiral organisms were not visible on H&E or silver stains. Gastritis may be stress-related secondary to severe systemic baterial infection. Footpad hyperkeratosis resembles vitamin A-responsive dermatosis, primary seborrhea and nasodigital/ear margin hyperkeratosis in dogs. In dogs, these conditions can have many causes, including any inflammatory dermatoses, hyperthyroidism, gonadal hormone aberrations, dietary fat deficiency, malabsorption or maldigestion, none of which appear likely in this ferret. The remaining diagnoses are considered less clinically significant.

Andrew Cartoeti	Andrew Cartoceti	4/18/2017
PROSECTOR	PATHOLOGIST	DATE COMPLETED

PATH # N2017-0043

Death Date: 3/15/2017
Necropsy Date: 3/15/2017

MUSTELA NIGRIPES
Black-footed ferret
Name: Dusty

Gender: Male
Age: 6Y 9M 13D
Chip: 041-005-363

Accession No.: 114743
Birth: 02 Jun 2010
Acquired: 18 Jul 2014
Removed: 15 Mar 2017

SEX: Male AGE: 6Y 9M 13D WEIGHT: 775.5 gm STAY: > 30 Days

MANNER OF DEATH:Euthanasia
TIME OF DEATH:08:00A
DEATH LOCATION:Whs
SUBMITTOR:KLK
OWNER/ANIMAL DEPT:DOM - SMH

INTERVAL:0-6 hours
XRAYED:False
DISPOSITION:FROZEN
PROSECTOR:Andrew Cartoeti

HISTORY AND CLINCICAL OBSERVATIONS:

KEEPER OBSERVATIONS: On By

CLINICIAN OBSERVATIONS: On 3/15/2017 By KLH

History of polydipsia with mildly increased liver enzymes, treated with denamarin.
3/7: exam at FHA for abdominal ultrasound and blood work and urinalysis. Ultrasound noted hepatic cyst and a small cyst in the mesentery of the right upper quadrant. Blood work was WNL. UA indicated some casts and bacteria in urine--cultured enterococcus.
3/10: Animal presented with 3-day history of anorexia and hiding since exam. Dehydrated with moderate azotemia and isosthenuria, hyponatremia, relative neutrophilia, mild anemia, pyuria and bacteriuria. Treated with fluids, antibiotics, antinausea, iron dextran, appetite stimulants
3/13: repeat exam showed improved kidney values, electrolytes, and PCV, but moderate to severe elevations in liver enzymes and total bilirubin, and ongoing isosthenuria. Additionally, ascites and a small amount of pleural effusion noted. Metronidazole and additional feeding strategies were employed along with ongoing treatments, but animal continued to decline.
3/15: collected repeat blood and urine samples (in house tests, urine culture, and bank), repeated abdominal ultrasound (prominent gall bladder and small amount of persistent ascites in upper left quadrant), and euthanized with 1ml euthasol IV via left jugular vein. Post mortem rads indicate worsening pleural effusion (mild-moderate), and enlarged pericardial silhouette (r/o pericardial effusion)

GROSS DESCRIPTION: On 3/16/2017 By ANC

Received is a 775.5 gram, adult, neutered male, black-footed ferret for necropsy on 15 March 2017 following euthanasia. A subcutaneous transponder reads "041-005-363." The carcass is in good postmortem condition and good body condition with adequate subcutaneous and intra-abdominal adipose stores. Several proximal coccygeal vertebrae are fused at an acute angle, giving the tail a kinked posture. There is suffusive hemorrhage in the subcutis along the ventral neck (euthanasia artifact) and left flank/lumbar region (fluid administration). The footpads are mildly thickened with dry, pale brown, fine papillary projections. A front and hind footpad and the surrounding fur are gold stained.

The mucus membranes, sclera, footpads and subcutis are yellowed. The pleural and peritoneal cavities have mildly increased (~1 ml), clear, yellow fluid and rare strands of fibrin. The lungs are soft, pink and float in formalin. In the epicardial surface of the left ventricular free wall, there is a ~3 x 5 mm focus of pale yellow discoloration. In the septal leaflet of the mitral valve, there is a ~3 mm diameter, pale yellow, soft nodule. The stomach is empty, the small intestines contain scant watery pale yellow fluid and the colon contains pasty brown-green feces. The vasculature of the intestinal tract, gall bladder and urinary bladder is injected. In the mesenteric serosa of duodenum, there is a 4 mm diameter, cyst filled with clear watery fluid. At the angle of the gastric and duodenal limbs of the pancreas, there are two ~7 mm diameter, red nodules with a finely granular/nodular surface (presumed pancreatic hyperplasia). The liver is dark red with subtle areas of more pale red mottling. Within the caudate lobe and right lateral lobe, there is a 2 mm diameter cyst filled with pale yellow watery fluid. The gallbladder, cystic duct, hepatic duct and common bile duct are filled with friable, semi-solid, dark green bile which cannot be express through the duodenal papilla. The bile ducts are dilated up to 4 mm in diameter and the walls of the ducts and gallbladder are thickened (1-2 mm thick). The parenchyma of both kidneys is yellow tinged. In the cortex of the left kidney, there are two stellate, ~5 mm diameter, dark red, capsular depressions that extend to the corticomedullary junction (chronic infarcts). On cut section, there is red mottling in the cortices, and white-yellow streaking in the medulla of both kidneys. The urinary bladder contains ~10 ml of clear, dark yellow urine.

The left maxillary canine tooth is fractured and has a blunt end. The right maxillary canine tooth is absent (previous extraction). There is moderate wear and mild calculus on most teeth.

GROSS DIAGNOSIS: By ANC

Gall bladder, bile ducts: Cholecystitis and choledochitis (presumptive) with cholestasis
Body as a whole: Jaundice
Pleural, peritoneal cavities: Effusion
Kidney: Bilateral nephropathy (presumptive nephritis) with chronic infarcts (left only)
Pancreas: Multiple masses (presumptive exocrine hyperplasia)
Liver, right lateral, caudate lobes: Multiple cysts
Mitral valve: Focal mass (fibrin thrombus vs. endocardiosis vs. endocarditis)
Duodenum: Focal cyst
Footpads: Hyperkeratosis
Teeth: Attrition with moderate wear and mild dental calculus

LABORATORY STUDIES:

CULTURE:	Liver, bile
OTHER:	musle tendon and trachea for cytogenetics

TISSUE STATUS:

SHELVED:	False
TRIMMED:	True
FROZEN:	False
ULTRAFROZEN:	True

Tissues Ultrafrozen: liver (2), kidney. foot, lung, spleen, colon, urine, bile

SPECIAL REQUESTS: On By

HISTOLOGY: On 4/18/2017 By ANC

1. KIDNEY, LEFT: Focally, there is a capsular depression and the corresponding cortex consists of condensed, shrunken, sclerotic glomeruli surrounded by fibrous connective tissue (chronic infarct). Many tubules are dilated, lined by attenuated epithelium and filled with proteinaceous fluid. Moderate numbers of neutrophils infiltrate the renal papilla, renal interstitium and tubule walls (medulla>cortex), which are often degenerate or necrotic and contain casts of sloughed cells and neutrophils. There is scattered interstitial hemorrhage and infiltration of few lymphocytes and plasma cells. Most glomeruli have moderately increased amounts of homogeneous eosinophilic matrix material. BROWN & HOPPS, WARTHIN STARRY: No bacteria are evident. CONGO RED: Thickened mesangium is congophilic but not birefringent. TRICHROME, PAS, PAMS: There is mild thickening of glomerular mesangium, but no spike, holes or splitting of the basement membranes to suggest immunoglobulin deposition.

2. KIDNEY, RIGHT; LIVER: The kidney is inflamed as previously described. In the liver, large bile ducts are dilated, filled with bile and proteinaceous fluid and surrounded by edema. The biliary epithelium is multifocally necrotic or regenerating and smaller ducts often contain neutrophils and fewer macrophages, streaming nuclear debris and small colonies of bacteria. Portal tracts are often infiltrated by few neutrophils (especially around affected bile ductules), lymphocytes, plasma cells, hematopoietic precursor cells and few megakaryocytes (extramedullary hematopoiesis). Sinusoids are congested and hepatocytes are small. Ito cells are numerous.

3. LIVER; BILE DUCTS; GALLBLADDER; PANCREAS; DUODENUM; LYMPH NODE, HEPATIC: The liver is inflamed as previously described. The adipose and connective tissue surrounding extrahepatic bile ducts is expanded by hemorrhage, proteinaceous fluid, few neutrophils and plump spindloid cells. Focally, there is an aggregate of hemosiderin laden macrophages. The wall of the gallbladder and extrahepatic bile ducts are infiltrated by neutrophils, necrotic cellular debris and hemorrhage and the mucosal epithelium is multifocally absent (necrotic). The lumen is filled with erythrocytes, fibrin, fewer neutrophils and bile. Few duodenal crypts are dilated, filled with degenerate neutrophils and lined by attenuated enterocytes. BROWN & HOPPS: There are rare Gram-positive cocci within affected bile duct lumina.

4. HEART, LEFT ATRIUM, MITRAL VALVE, LEFT VENTRICLE: Adhered to the mitral valve leaflet is a large coagulum of fibrin with embedded erythrocytes, neutrophils and colonies of cocci. The base of the leaflet is infiltrated by neutrophils, plump spindloid cells and fewer macrophages and lymphocytes. Focally in the left ventricle, a group of myofibers is necrotic and few macrophages infiltrate the interstitium. BROWN & HOPPS: Bacteria within the coagulum are predominantly individualized Gram-positive cocci.

5. LUNG: WNL.

6. LIVER; SPLEEN: The liver is inflamed as previously described. There is trilineage development of hematopoietic cells in the splenic red pulp.

7. HEART, RIGHT ATRIUM AND VENTRICLE, INTERVENTRICULAR SEPTUM: WNL.

8. ADRENAL; THYROID; PANCREAS; DUODENUM; LYMPH NODES, PERIPANCREATIC: In the adrenal sinusoids, there are scattered hematopoietic cells. Along the mesenteric serosa of the duodenum, there is a cyst lined by simple cuboidal ciliated epithelium and a thin fibrous connective tissue wall. Lymph node sinuses are cystically dilated and contain proteinaceous fluid, polymerized fibrin and erythrocytes mixed with lymphoid cells. Medullary sinuses contain extramedullary hematopoiesis.

9. URINARY BLADDER; TRACHEA; ESOPHAGUS: WNL.

10. STOMACH: In the cardia and fundus, many gastric glands are dilated and filled with proteinaceous fluid while others are lined by variably disorganized, attenuated, degenerate or hyperplastic epithelium. Rarely, there is nesting of glands surrounded by a thin rim of fibrous connective tissue. Scattered lymphocytes infiltrate the lamina propria and muscularis mucosa, often forming nodular aggregates. WARTHIN STARRY: Spiral bacteria are not evident.

11. FOOTPADS: Multifocally, there is excess basophilic to eosinophilic, lamellar, anucleate keratin that lines the surface of epidermal papilla and fills and dilates the infundibula of compound hair follicles.

12. SMALL INTESTINE; LARGE INTESTINE: Serosal blood vessels are often congested.

13. BRAIN, CEREBRUM, THALAMUS: Multifocally, there is discrete, clear vacuolation of the neuropil along the deep aspect of the cortical grey matter.

14. BRAIN, CEREBRUM, THALAMUS, MIDBRAIN: Multifocally, there is discrete, clear vacuolation of the neuropil along the deep aspect of the cortical grey matter. A small blood vessel within the cortical white matter is occluded by a fibrin thrombus with embedded neutrophils and karyorrhectic debris.

15. BRAIN, CEREBELLUM, BRAINSTEM: Multifocally in the white matter of the cerebellum, there is mineralization of the blood vessel walls as well as nodular aggregates of mineral in the surrounding neuropil. Few pigment-laden macrophages surround some affected vessels.

MORPHOLOGIC DIAGNOSIS:

1) Heart, mitral valve: Severe, focally extensive, subacute, suppurative endocarditis with intralesional coccoid bacteria
2) Gallbladder, extrahepatic bile ducts: Severe, diffuse, subacute, hemorrhagic and suppurative cholecystitis and cholangitis
3) Liver: Moderate, diffuse, acute, necrosuppurative cholangiolitis with intrabiliary bacteria

4) Kidneys: Moderate, multifocal, acute, suppurative tubulointerstitial nephritis with tubular degeneration, regeneration, necrosis and ectasia
5) Stomach: Moderate, diffuse, chronic, lymphoplasmacytic gastritis with gland ectasia, necrosis and regeneration
6) Heart: Focal, acute myocardial necrosis
7) Brain: Focal vascular thrombus
8) Duodenum: Mild, multifocal, acute, necrotizing enteritis
9) Kidney: Diffuse, global mesangial glomerulopathy
10) Kidney (left): Multifocal, chronic, cortical atrophy and fibrosis (chronic infarcts)
11) Brain: Mild, laminar, cerebral cortical vacuolation
12) Liver: Mild, diffuse, chronic portal hepatitis and extramedullary hematopoiesis
13) Duodenum: Focal serosal cyst
14) Footpads: Mild, multifocal, orthokeratotic hyperkeratosis

REMARKS: On 4/18/2017 By ANC

4/18/17: Histology confirmed endocarditis, cholangiohepatitis and cholecystitis due to infection with a Gram-positive coccoid bacteria. Culture of the bile and liver yielded no growth, but infection with Enterococcus faecalis (previously cultured from the urine) is possible. The site of initial infection is unclear; however, the distribution of inflammation within the kidneys is not suggestive of ascending pyelonephritis. A primary bacterial endocarditis or cholangitis progressing to sepsis is more likely. Myocardial necrosis, vascular thrombosis in the brain, necrotizing duodenitis and suppurative tubulointerstitial nephritis are likely sequelae of disseminated bacterial infection and sepsis, although bacteria could not be demonstrated in the kidneys on special stains. Mesangial glomerulopathy is similar to that seen in other animals from the Rock Creek and Front Royal collections; further work-up for antibody deposition disorders requires transmission electron microscopy. Gastritis is reminiscent of Helicobacter infection; however spiral organisms were not visible on H&E or silver stains. Gastritis may be stress-related secondary to severe systemic baterial infection. Footpad hyperkeratosis resembles vitamin A-responsive dermatosis, primary seborrhea and nasodigital/ear margin hyperkeratosis in dogs. In dogs, these conditions can have many causes, including any inflammatory dermatoses, hyperthyroidism, gonadal hormone aberrations, dietary fat deficiency, malabsorption or maldigestion, none of which appear likely in this ferret. The remaining diagnoses are considered less clinically significant.

Andrew Cartoeti	Andrew Cartoceti	4/18/2017
PROSECTOR	PATHOLOGIST	DATE COMPLETED

Printed on: 4/18/2017 4:16:59 PM CARES-MED v2.119

Pathology Module - Final Pathology Report
NATIONAL ZOOLOGICAL PARK

PATH # N2017-0044

Death Date: 3/16/2017
Necropsy Date: 3/16/2017

CALLITHRIX GEOFFROYI
White-fronted marmoset
Name: Pequena

Gender: Female
Age: 11Y 9M 27D
Chip: 081*011*352

Accession No.: 115437
Birth: 17 May 2005
Acquired: 14 Nov 2016
Removed: 16 Mar 2017

SEX: Female AGE: 11Y 9M 27D WEIGHT: 408.4 gm STAY: > 30 Days

MANNER OF DEATH: Euthanasia
TIME OF DEATH: 10:15A
DEATH LOCATION: WHS
SUBMITTOR: JCS/JSW
OWNER/ANIMAL DEPT: DOM - SMH

INTERVAL: 0-6 hours
XRAYED: False
DISPOSITION: INCINERATE
PROSECTOR: Andrew Cartoceti

HISTORY AND CLINCICAL OBSERVATIONS:

KEEPER OBSERVATIONS: On By

CLINICIAN OBSERVATIONS: On 3/16/2017 By

11yo F marmoset presented on emergency 3/12 for 3d hx of diarrhea, decreased appetite, lethargy, and weight loss. Clinical findings over past few days include severe azotemia that had resolved with fluid therapy, elevated liver enzymes (ALP, GGT, total bilirubin, and AST. Marmoset was being treated with maropitant, famotidine, clavamox, ciprofloxacin, mirtazapine, denosyl, and benebac. Mild to moderate improvement in appetite and behavior, but recheck exam today 3/16 showed worsening liver enzymes, left shift with toxic changes on CBC, possible partial biliary obstruction with hyperechoic gallstone. Chronic changes seen on ultrasound with both kidneys. Due to concerns for quality of life euthanasia was performed via IV injection of euthasol in the left femoral vein. Leptospirosis urinary PCR and serology pending. Suspect liver disease due to severe intermittent cholestasis and associated cholangiohepatitis.

GROSS DESCRIPTION: On 3/16/2017 By ANC

Received is a 408.4 gram, adult, intact female, white-fronted marmoset for necropsy on 16 March 2017 following euthanasia. The carcass is in good postmortem condition and poor body condition with generalized muscle atrophy and minimal subcutaneous and intra-abdominal adipose stores. The mucus membranes, sclera, skin and subcutis are yellowed. There is an area of alopecia in over the right hip and the skin is discolored purple. The subcutis of the right flank has suffusive hemorrhage (presumed fluid administration).

The heart has a rounded shape and the myocardium is segmentally thinned and dark red along the junction of the right and left free walls cranially. The epicardial surface of the right ventricular free wall has a ~2 mm diameter depression. The lungs are pink, soft and float in formalin.

The liver is diffusely yellow-brown with a finely granular/nodular capsular surface, multifocal red discoloration and rounded edges to some lobes. On cut section, bile ducts are prominent and have thickened walls. The gallbladder contains viscous dark green bile and there is a <1 mm diameter, soft, pale brown aggregate of material at the insertion of the common bile duct on the duodenum. The walls of the bile ducts and gallbladder are mildly thickened (1 mm thick). Bile can be expressed into the duodenum. The vasculature of the gallbladder, gastrointestinal tract, urinary bladder and uterus are prominent and injected. The kidneys measure ~2 cm long by 1.3 cm in diameter and there is subtly pale yellow mottling in the cortices.

The stomach is empty, the small intestine contains scant watery to mucoid pale orange fluid and the colon contains pasty to granular green feces.

There is moderate to severe wear of the teeth, with multiple fractures and moderate amounts of dental calculus.

GROSS DIAGNOSIS: By ANC

Liver, gallbladder, bile ducts: Presumptive cholangiohepatitis and choledochitis with focal cholelith/bile aggregate
Body as a whole: Jaundice
Teeth: Moderate to severe dental attrition and calculus

LABORATORY STUDIES:

CULTURE: Bile, liver

TISSUE STATUS:

SHELVED: False

TRIMMED: True

FROZEN: False

ULTRAFROZEN: True

Tissues Ultrafrozen: Liver (2), kidney, spleen, lung, bile

SPECIAL REQUESTS: On By

HISTOLOGY: On 4/4/2017 By ANC

1. LUNG: WNL.

2. LIVER: Within portal tracts, there are increased cross-sections of small bile ductules which, along with larger bile ducts, are often surrounded by concentric rings of dense mature collagen. Multifocally, collagen tendrils extend along and bridge adjacent portal tracts and surround rounded, nodular hepatic lobules that lack central veins (hepatic regeneration). Portal tracts and fibrotic tracts, especially around bile ducts, are infiltrated by neutrophils, which sometimes extend into the hepatic sinusoids, and fewer pigment-laden macrophages, lymphocytes and plasma cells. The space of Disse in sinusoids is markedly expanded by eosinophilic extracellular material (presumptive amyloid). In most severely affected areas, amyloid widely separates hepatic cords, which are atrophied. The hepatic capsule is undulating.

3. LIVER; GALLBLADDER: The liver is affected as previously described. Scattered neutrophils infiltrate the mucosa and subepithelial stroma of the gallbladder and extrahepatic bile ducts. The walls of the gallbladder and extrahepatic bile ducts is mildly thickened by excess collagenous connective tissue with scattered infiltrating lymphocytes.

4. BILE DUCTS, EXTRAHEPATIC; LYMPH NODE, HEPATIC; DUODENUM; PANCREAS: The subepithelial stroma of bile ducts is infiltrated by variable numbers of lymphocytes, neutrophils and fewer macrophages; lymphocytes occasionally form dense nodular aggregates. Lymph node sinuses are flooded by erythrocytes and the cortices have many follicles with germinal centers. Focally in the pancreas, there is nodule of proliferative, elongate, neuroendocrine cells forming small nests or cords that palisade around fibrovascular cores. The nodule compresses the surrounding exocrine pancreatic cells.

5. KIDNEY; SPLEEN: Presumptive amyloid multifocally expands the red pulp, sometimes outlining lymphoid aggregates. The glomerular mesangium of most glomeruli is segmentally expanded by homogeneous eosinophilic material (possible amyloid). Scattered tubules in the cortex and medulla are markedly dilated, filled with granular to homogeneous pale eosinophilic to golden brown material admixed with few cells and are lined by attenuated epithelium. Multifocally the interstitium is infiltrated by neutrophils and fewer lymphocytes, plasma cells and macrophages that separate and surround tubules. Some inflamed areas have increased interstitial connective tissue, condensation of glomeruli and indention of the capsular surface. Rare tubules are dilated.

6. HEART; ADRENAL; LYMPH NODE, MESENTERIC: In both glands, sinuses of the inner adrenal cortex are multifocally expanded by presumptive amyloid. In one gland, there is infiltration of neutrophils and fewer lymphocytes and plasma cells within regions of presumptive amyloid deposition and in the interstitium of the medulla. Nodal sinuses are flooded with erythrocytes.

7. TRACHEA; ESOPHAGUS; THYMUS; THYROID; STOMACH; DUODENUM; PANCREAS; URINARY BLADDER: There is a proliferative endocrine nodule in the pancreas, as previously described.

8. SMALL INTESTINE; LARGE INTESTINE: The lamina propria of villous tips is expanded by presumptive amyloid. Diffusely, few eosinophils and neutrophils infiltrate the lamina propria between crypts.

9. ILEOCECAL JUNCTION; LARGE INTESTINE: There is proprial amyloid (presumptive) in the small intestine. Eosinophils infiltrate the small and large intestinal lamina propria. Multifocally, the serosal adipose of the large intestine is infiltrated by neutrophils.

10. OVARY; OVIDUCT; UTERINE BODY; CERVIX: There is normal follicular development in both ovaries. Few blood vessels in the muscularis of the oviduct are surrounded by few neutrophils.

11. BRAIN; CEREBRUM; MIDBRAIN; CEREBELLUM; BRAINSTEM: WNL

12. BRAIN; CEREBRUM: WNL.

13. BRAIN; CEREBRUM, MIDBRAIN: WNL.

ADDENDUM: SPECIAL STAINS (4/18/17):

3. CONGO RED: Extracellular material within sinusoids is congophilic and emits green birefringence. STEINER: There are no argyrophilic bacteria evident. BROWN & HOPPS: There are no bacteria evident.

5. HALL'S: Renal tubular casts are negative for bile/bilirubin staining. CONGO RED: Extracellular material within the red pulp, splenic arteries, renal interstitium and glomerular mesangium is congophilic and emits green birefringence. STEINER: There are no argyrophilic bacteria evident. BROWN & HOPPS: There are no bacteria evident.

MORPHOLOGIC DIAGNOSIS:

1) (A) Liver: Moderate, multifocal, chronic-active cholangiohepatitis with biliary hyperplasia, peribiliary and portal bridging fibrosis

1) (B) and hepatocellular regeneration (biliary cirrhosis)
2) Gallbladder, bile ducts: Moderate, chronic-active, diffuse, neutrophilic and lymphocytic cholecystitis and cholangitis with cholelithiasis
3) Liver: Moderate to severe, diffuse, sinusoidal amyloidosis (presumptive) with hepatocellular atrophy
4) Spleen, adrenal gland, small intestine: Mild to moderate amyloidosis (presumptive)
5) Kidney: Moderate, multifocal, chronic-active, neutrophilic and lymphoplasmacytic interstitial nephritis with tubular ectasia and casts
6) Kidney: Moderate, diffuse, segmental, membranous glomerulopathy (suspect amyloidosis)
7) Adrenal gland: Mild, locally extensive, unilateral, chronic-active neutrophilic and lymphoplasmacytic adrenal adenitis
8) Intestine: Mild, diffuse eosinophilic enterotyphlocolitis with intraluminal large intestinal nematodes (presumptive Oxyurids)
9) Pancreas: Neuroendocrine adenoma

REMARKS: On 4/4/2017 By ANC

4/18/17 (ADDENDUM): Amyloidosis in the hepatic sinusoids, splenic red pulp and arteries and renal interstitium and glomeruli was confirmed on special staining. Bacteria were not identified on special stains of the liver and kidneys, and renal tubular casts were negative for bile/bilirubin. This concludes all diagnostic testing.

4/4/17: Histology revealed inflammation, hyperplasia and fibrosis of the biliary tree that is strongly suggestive of chronic obstructive cholestasis, but these changes can also be produced as a response to prior severe hepatocellular injury (toxic or infectious), biliary tract infection or hypoxia. Cholestasis is presumed to be due to cholelithiasis of the distal common bile duct, which was detected on imaging and gross examination. Speculatively, chronic intermittent biliary obstruction may have been compensated for through biliary hyperplasia/cholehepatic bile recirculation until this mechanism became overwhelmed causing the animal to present with acute biliary failure. Additionally, severe hepatic amyloidosis was also contributing to hepatobiliary dysfunction. Aerobic cultures of the liver and bile yielded no growth. Presumptive amyloidosis was also detected in the spleen, adrenal gland, intestines and renal glomeruli and is likely secondary to chronic inflammation in the urinary and biliary tracts. Chronic-active nephritis was also confirmed, the cause of which is unknown at this time. Many dilated renal tubules contained yellow-brown casts that are suspicious for bile and "bile cast nephropathy" secondary to severe liver dysfunction is possible. There were no significant diseases or structural abnormalities in the reproductive tract to explain this animal's inability to reproduce. The ovaries had normal follicular development. Special stains for amyloid, infectious agents and bile are pending.

Andrew Cartoceti	Andrew Cartoceti	4/4/2017
PROSECTOR	PATHOLOGIST	DATE COMPLETED

Printed on: 4/18/2017 3:48:05 PM CARES-MED v2.119

Pathology Module - Final Pathology Report
NATIONAL ZOOLOGICAL PARK

PATH # N2017-0045

Death Date: 3/15/2017
Necropsy Date: 3/16/2017

CARDUELIS CUCULLATA
Red siskin
Name:

Gender: Female
Age: 1Y 11M 0D

Accession No.: 216575
Birth: 15 Apr 2015
Acquired: 14 Mar 2017
Removed: 15 Mar 2017

SEX: Female AGE: 1Y 11M 0D WEIGHT: 10.2 gm STAY: <= 30 Days

MANNER OF DEATH: Found Dead
TIME OF DEATH: 17:30
DEATH LOCATION: SCBI Vet Hospital: C-117A
SUBMITTOR: Diana Boon
OWNER/ANIMAL DEPT: DCM

INTERVAL: 6-24 hours
XRAYED: False
DISPOSITION: FORMALIN
PROSECTOR: Cartoceti

HISTORY AND CLINCICAL OBSERVATIONS:

KEEPER OBSERVATIONS: On 3/16/2017 By ER

-Housed indoors with 0.1 conspecifics
-No cage mate aggression observed after arrival to SCBI. Cage mate aggression in previous location unknown.
-No known health problems. In quarantine, bird was offered seed diet utilized by private aviculturist (bird's origin) in addition to seed diet utilized at SCBI.

Found lying supine on the floor in the back of her quarantine enclosure at 1515. Was observed at 1130 and appeared BAR. No rigor present. No obvious trauma. Feathers appeared to be intact.

1.4 Red siskins arrived on 14 March 2017 at 1600 and were examined briefly by veterinary staff upon arrival. Birds were driven from private aviculturist in Imlay City, Michigan (10 hours) and then released into quarantine enclosures at the veterinary hospital at SCBI. Upon arrival all birds appeared to be under conditioned and flight ability appeared to be weak. Birds were previously housed in small enclosures (approximately 12" x 8" x 8"). There is no medical history available for this individual.

CLINICIAN OBSERVATIONS: On 3/16/2017 By DB

Bird arrived into Quarantine on 3/14/17. Slightly weak, ventrum damp. Appeared clinically normal until found dead.

GROSS DESCRIPTION: On 3/16/2017 By ANC

Received is a 10.2 gram (wet), adult, female, red siskin for necropsy on 16 March 2017 after being found dead on 15 March 2017. The carcass is in fair to good postmortem condition and fair body condition with well-fleshed pectoral muscles but no appreciable subcutaneous or intra-coelomic adipose stores. The left leg has a red band that reads "USA COM 15 410." There is mild feather loss at the commissures of the beak. The oral cavity and esophagus at the level of the thoracic inlet contain few millet seeds. The lungs are pale pink, soft and float in formalin. The proventriculus and ventriculus are empty. The liver is mottled red to pale brown. The ovary contains many non-vitellogenic follicles. The duodenum contains dark brown-green watery ingesta and the colon contains dark green pasty feces. The brain, oral cavity, trachea, esophagus, thyroid glands, heart, spleen and kidneys are grossly unremarkable.

GROSS DIAGNOSIS: By ANC

Fair body condition with no adipose stores

LABORATORY STUDIES:

TISSUE STATUS:

SHELVED:	False
TRIMMED:	True
FROZEN:	False
ULTRAFROZEN:	True

Tissues Ultrafrozen: spleen, feather/skin

SPECIAL REQUESTS: On By

HISTOLOGY: On 4/26/2017 By ANC

1. SPLEEN; LIVER; KIDNEY; LUNG: Diffusely, there is marked eosinophilia, loss of differential staining and overgrowth of bacilli (postmortem autolysis).

2. BRAIN; INTESTINES; CLOACA: Diffusely, there is marked eosinophilia, loss of differential staining and overgrowth of bacilli (postmortem autolysis).

3. HEART; PROVENTRICULUS; VENTRICULUS; TRACHEA; ESOPHAGUS: Diffusely, there is marked eosinophilia, loss of differential staining and overgrowth of bacilli (postmortem autolysis).

4. HEAD; EYES; PECTORAL MUSCLE: Diffusely, there is marked eosinophilia, loss of differential staining and overgrowth of bacilli (postmortem autolysis). In the epidermis of the side of the head, there are two intra-corneal aggregates of degenerate heterophils.

5. PECTORAL MUSCLE; LIVER; KIDNEY; SMALL INTESTINE; BRAIN; LUNG; TRACHEA; ESOPHAGUS: Perivisceral adipocytes are atrophic.

CYTOLOGY: LUNG IMPRESSIONS: WNL. Hemoparasites are not evident.

MORPHOLOGIC DIAGNOSIS:

1) Body as a whole: Poor body condition with adipocyte atrophy
2) Skin, head: Mild, multifocal, heterophilic dermatitis

REMARKS: On 4/26/2017 By ANC

4/26/17: Histology revealed atrophy of adipose stores confirming this bird's poor body condition. In the absence of other observable gross or histologic disease, under-conditioning and transport-associated stress are presumed to be the primary factors likely contributing to this bird's death.

Cartoceti	Andrew Cartoceti	4/26/2017
PROSECTOR	PATHOLOGIST	DATE COMPLETED

Printed on: 4/26/2017 9:05:02 AM CARES-MED v2.119

Pathology Module - Final Pathology Report
NATIONAL ZOOLOGICAL PARK

PATH # N2017-0053

Death Date: 4/5/2017
Necropsy Date: 4/5/2017

PIPA PARVA
Sabana Surinam toad
Name:

Gender: Unknown Sex
Age:

Accession No.: 307594
Birth:
Acquired: 12 May 2016

SEX: Unknown Sex AGE: ADULT WEIGHT: 4.6 gm STAY: > 30 Days

MANNER OF DEATH: Found Dead
TIME OF DEATH: 09:00A
DEATH LOCATION: BLS #4
SUBMITTOR: Saffoe
OWNER/ANIMAL DEPT: DOA

INTERVAL: 0-6 hours
XRAYED: False
DISPOSITION: FORMALIN
PROSECTOR: Andrew Cartoceti

HISTORY AND CLINCICAL OBSERVATIONS:

KEEPER OBSERVATIONS: On 4/5/2017 By CS

Animal was found dead in tank. It was hung up on a branch in the tank and the abdomen appeared to be open.

CLINICIAN OBSERVATIONS: On By

GROSS DESCRIPTION: On 4/5/2017 By ANC

Received is a 4.6 gram, adult, unknown sex, dwarf surinam toad for necropsy on 5 April 2017 following being found dead. There is moderate postmortem autolysis with sloughing of the skin, putrid odor and friability of coelomic organs. Fat bodies are not identified. Both corneas are diffusely cloudy. In the body wall of the right flank, there is a full-thickness ~1.5 cm long laceration with herniation of the stomach, small intestine and left lung but no associated hemorrhage (presumed postmortem). The skin and muscle of the left hind leg are absent, with only bone remaining. The heart, lungs, spleen, kidneys and gastrointestinal tract are grossly unremarkable.

GROSS DIAGNOSIS: By ANC

Possible postmortem scavenging/trauma

LABORATORY STUDIES:

TISSUE STATUS:

SHELVED:	True
TRIMMED:	False
FROZEN:	False
ULTRAFROZEN:	True

Tissues Ultrafrozen: Liver

SPECIAL REQUESTS: On By

HISTOLOGY: On 4/26/2017 By ANC

1. HEART; LIVER; LUNG: There is marked autolysis, characterized by sloughing of epithelial linings, diffuse eosinophilia, loss of differential staining with retention of tissue architecture and overgrowth of bacilli. There is a aggregate of coarse granular mineral in the lungs. One central airway contains a small amount of keratin debris.

2. GASTROINTESTINAL TRACT; LIVER; KIDNEY; TESTES: There is marked autolysis, as previously described. The mesentery/serosa of an intestinal loop contains an aggregate of coarse granular mineral.

3. HEAD, BRAIN; LARYNX: There is marked autolysis, as previously described.

4. LIMBS: There is marked autolysis, as previously described.

MORPHOLOGIC DIAGNOSIS:

1) Body as a whole: No significant histolologic lesions identified, marked autolysis

REMARKS: On 4/26/2017 By ANC

4/26/17: There were no histologic lesions to suggest a cause of death; however, advanced postmortem autolysis precluded a more detailed histologic evaluation and may have obscured subtle lesions.

Andrew Cartoceti	A. Cartoceti	4/26/2017
PROSECTOR	PATHOLOGIST	DATE COMPLETED

Printed on: 4/26/2017 9:59:00 AM CARES-MED v2.119

Pathology Module - Final Pathology Report
NATIONAL ZOOLOGICAL PARK

PATH # N2017-0054

Death Date: 4/6/2017
Necropsy Date: 4/6/2017

RINELORICARIA LANCEOLATA
Lanceolate whiptail catfish
Name:

Gender: Unknown Sex
Age:

Accession No.: 500862
Birth:
Acquired: 15 Sep 2015
31 Dec 2016

SEX: Unknown Sex AGE: ADULT WEIGHT: 5.6 gm STAY: > 30 Days

MANNER OF DEATH: Found Dead
TIME OF DEATH: 08:00A
DEATH LOCATION: FSA3
SUBMITTOR: Hilary Colton
OWNER/ANIMAL DEPT: DOA

INTERVAL: 0-6 hours
XRAYED: False
DISPOSITION: FORMALIN
PROSECTOR: Andrew Cartoceti

HISTORY AND CLINCICAL OBSERVATIONS:

KEEPER OBSERVATIONS: On 4/6/2017 By HC

0.0.1 Lanceolata whiptail catfish found dead during water change. Specimen in good condition, no sloughing skin. Somewhat bloated, pectoral fins sticking out at near-90* angles. Tankmates all BAR, exhibit tank is 79*F.

CLINICIAN OBSERVATIONS: On By

GROSS DESCRIPTION: On 4/6/2017 By ANC

Received is a 5.6 gram, sex pending histology, adult whiptail catfish for necropsy on 6 April 2017 following being found dead. The carcass has a total length of 9.2 cm and is in fair postmortem condition. There is generalized reddening of the skin, skeletal muscles and coelomic organs. Small fat droplets surround coelomic organs. The eyes, fins and intestinal tract are grossly unremarkable. Cytology of skin scrapes and fin clips are unremarkable.

GROSS DIAGNOSIS: By ANC

Body as a whole: Generalized reddening

LABORATORY STUDIES:

TISSUE STATUS:

SHELVED:	False
TRIMMED:	True
FROZEN:	False
ULTRAFROZEN:	True

Tissues Ultrafrozen: Intestine with liver

SPECIAL REQUESTS: On By

HISTOLOGY: On 5/4/2017 By ANC

1. LIVER; SPLEEN; GASTROINTESTINAL TRACT; TESTES: In the spleen, small arteriole walls are thickened by hyalinized eosinophilic extracellular matrix. Larger arteries are often surrounded or infiltrated (adventitia) by pigment-laden macrophages (presumed hemosiderin). The stomach contains an arthropod and the intestinal lumen contains plant debris. There is marked autolysis of some sections of intestinal tract, characterized by sloughing of epithelial linings, diffuse eosinophilia, loss of differential staining with retention of tissue architecture and overgrowth of bacilli. Perivisceral adipocytes are replete with lipid. In a large locally extensive region of the testes, normal seminiferous lobules are disrupted by anastomosing trabecular of homogeneous eosinophilic material (serum?) that separates variably sized sheets of large round cells that lack obvious sperm development.

2. HEAD, MOUTH, EYES, BRAIN; GILLS, HEART; ESOPHAGUS, ANTERIOR KIDNEY: An arthropod is lodged between two primary gill lamellae. The sarcoplasm of scattered muscle fibers in the head is fragmented, vacuolated and lack striations (necrotic).

3. BODY WALL, ANTERIOR and POSTERIOR KIDNEY; PEDUNCLE: Renal tubular epithelium contains eosinophilic protein droplets in the cytoplasm. The sarcoplasm of scattered muscle fibers are fragmented, vacuolated and lack striations (necrotic).

MORPHOLOGIC DIAGNOSIS:

1) Testis: Gonadal tumor (suspect seminoma or Sertoli cell tumor)

REMARKS: On 5/4/2017 By ANC

5/4/17: Histology revealed a gonadal tumor that could not be further classified to a cell of origin (suspected seminoma or Sertoli cell tumor) due to autolysis of the tissues. The significance of this tumor is unclear. Although it appears to be locally destructive within the testis, the animal appears to be in good body condition (replete lipid stores) and had recently eaten (ingesta in digestive tract). There were no other significant histologic findings.

Andrew Cartoceti	Andrew Cartoceti	5/4/2017
PROSECTOR	PATHOLOGIST	DATE COMPLETED

Printed on: 5/4/2017 8:47:50 AM CARES-MED v2.119

Pathology Module - Final Pathology Report
NATIONAL ZOOLOGICAL PARK

PATH # N2017-0056

Death Date: 4/7/2017
Necropsy Date: 4/8/2017

CHELODINA LONGICOLLIS
Australian snake-necked turtle
Name:

Gender: Male
Age: 24Y 10M 0D
Chip: 4B1372664F

Accession No.: 306200
Birth: 07 Jun 1992
Acquired:
Removed: 07 Apr 2017

SEX: Male AGE: 24Y 10M 0D WEIGHT: 487.5 gm STAY: > 30 Days

MANNER OF DEATH: Found Dead
TIME OF DEATH: 15:30
DEATH LOCATION: D3
SUBMITTOR: Michael Miller
OWNER/ANIMAL DEPT: DOH

INTERVAL: 6-24 hours
XRAYED: False
DISPOSITION: INCINERATE
PROSECTOR: Andrew Cartoceti

HISTORY AND CLINCICAL OBSERVATIONS:

KEEPER OBSERVATIONS: On 4/7/2017 By MM

Freshly deceased.

CLINICIAN OBSERVATIONS: On By

GROSS DESCRIPTION: On 4/10/2017 By ANC

Received is a 487.5 gram, adult, male, Eastern long-necked turtle for necropsy on 8 April 2017 after being found dead. A subcutaneous transponder in the left flank/thigh reads "FDX-A 4B1372664F." The carcass is in fair to good postmortem condition and good body condition with adequate amounts of subcutaneous and intra-coelomic adipose stores. The liver has an enhanced reticular pattern and red to pale tan to black with many small embedded gas bubbles (postmortem autolysis). The mucosa of the esophagus is expanded by many gas bubbles (postmortem autolysis). The stomach contains insect parts, the small intestines contain granular, soft, brown ingesta, and the colon contains soft, granular, brown, unformed feces. The urinary bladder is empty. The eyes, oral cavity, trachea, lungs, heart, spleen, kidneys, testes and penis are unremarkable.

GROSS DIAGNOSIS: By ANC

No significant gross lesions identified
Good body condition

LABORATORY STUDIES:

TISSUE STATUS:

SHELVED:	False
TRIMMED:	True
FROZEN:	False
ULTRAFROZEN:	True

Tissues Ultrafrozen: Liver, lung, kidney, colon

SPECIAL REQUESTS: On By

HISTOLOGY: On 5/10/2017 By ANC

1. LUNG; THYROID GLAND; SKELETAL MUSCLE: Subepithelial stroma in the bronchi and faveolae are infiltrated by few granulocytes and scattered aggregates of small lymphocytes. Bronchiolar epithelium is often denuded and sloughed into the lumen along with proteinaceous fluid and numerous bacilli (postmortem autolysis). Blood vessel lumina in the lung and skeletal muscle often contain numerous bacilli (postmortem autolysis) and fewer ~5 x 2 um, thin elliptical organisms with a distinct thin wall, clear cytoplasm and a 1-2 um diameter, deeply basophilic polar body.

2. LUNG; TRACHEA; BRONCHI; THYMUS; PARATHYROID GLAND: The lungs and bronchi are as previously described. Blood vessel lumina contain bacilli and elliptical organisms as previously described. Scattered granulocytes infiltrate the thymic lobules and interlobular septa.

3. LIVER; SPLEEN; KIDNEY: Hepatic sinusoids are often filled with bacilli and many elliptical organisms, which often form large dense sheets. Melanomacrophage centers are enlarged and heavily pigmented (hyperplasia). Many clear cystic spaces dilate the hepatic parenchyma (postmortem gas production). Scattered renal tubules are mineralized and there are small dense aggregates of granulocytes in the renal interstitium.

4. KIDNEY; TESTIS: The kidneys are as previously described. There is active spermatogenesis in the

testis. Blood vessel lumina contain bacilli and elliptical organisms as previously described.

5. HEART; AORTA: Blood vessel lumina and heart chambers contain small colonies of large bacilli and elliptical organisms as previously described.

6. ESOPHAGUS; STOMACH; SMALL INTESTINE: There is marked autolysis of digestive tract sections, characterized by diffuse eosinophilia, loss of differential staining, sloughing of enterocytes and overgrowth of bacilli. Many large gas bubbles expand the esophageal mucosa (postmortem gas production). Blood vessel lumina contain bacilli and elliptical organisms as previously described.

7. LARGE INTESTINE; CLOACA; URINARY BLADDER: Blood vessel lumina contain bacilli and elliptical organisms as previously described. In the cloaca, few granulocytes infiltrate the mucosal epithelium and underlying stroma.

8. HEAD, NASAL CAVITY, EYES: Focally, in the skin ventral to the eye, there is a small region of epidermal necrosis overlain by a crust of serum and keratin that is colonized by few fungal hyphae.

9. HEAD, BRAIN: There are two foci of epidermal necrosis and fungal colonization, as previously described.

10. HEAD, BRAIN: WNL.

11. HEAD, BRAIN, MIDDLE EAR: WNL.

SPECIAL STAINS:
3. ZEIHL-NEELSEN, BROWN & HOPPS, WARTHIN STARRY, GIEMSA: Ellipitcal intravascular organisms are Gram-positive, highlighted by Giemsa and have an acid-fast and argyrophilic, eccentric nucleus/polar body.

MORPHOLOGIC DIAGNOSIS:

1) Blood vessels: Abundant elliptical organisms (suspect protozoa) and bacilli (presumptive postmortem autolysis)
2) Skin, head: Mild, acute, focal epidermal necrosis with superficial fungal colonization
3) Liver: Diffuse melanomacrophage hyperplasia
4) Kidneys: Mild to moderate, multifocal tubular mineralization
5) Cloaca: Mild, segmental, granulocytic cloacitis
6) Body as a whole: Good body condition

REMARKS: On 6/6/2017 By ANC

6/5/17: Special staining of the intravascular organisms is not indicative of microsporidia or any particular protozoa. After consultation with several other pathologists, algae were also considered as possible microorganism. Regardless, these are believed to be represent postmortem overgrowth and cause of death remains undetermined.

5/10/17: A definitive cause of death was not identified as all histologic diagnoses are interpreted as mild and less clinically significant. The animal's good body condition at the time of death suggest that it was unlikely to be suffering from chronic disease. Unusual and yet unidentified organisms (special stains pending) were present in the lumina of many blood vessels. Speculatively, these organisms seem most likely to be protozoa or microsporidia; however, they incite no appreciable host response and their significance is unknown. Bacteria were also widespread throughout the vascular system, but are interpreted as postmortem overgrowth.

Andrew Cartoceti	Andrew Cartoceti	6/6/2017
PROSECTOR	PATHOLOGIST	DATE COMPLETED

Pathology Module - Final Pathology Report
NATIONAL ZOOLOGICAL PARK

PATH # N2017-0057

Death Date: 4/8/2017
Necropsy Date: 4/8/2017

LEONTOPITHECUS CHRYSOMELAS
Golden-headed lion tamarin
Name: Zikki

Gender: Female
Age: 17Y 6M 15D
Chip: 049 069 282

Accession No.: 113804
Birth: 24 Sep 1999
Acquired: 06 May 2003
Removed: 08 Apr 2017

SEX: Female AGE: 17Y 6M 15D WEIGHT: 769.3 gm STAY: > 30 Days

MANNER OF DEATH: Euthanasia
TIME OF DEATH: 11:00
DEATH LOCATION: WHS
SUBMITTOR: Jess Siegal-Willott
OWNER/ANIMAL DEPT: DOM - SMH

INTERVAL: 0-6 hours
XRAYED: False
DISPOSITION: INCINERATE
PROSECTOR: Andrew Cartoceti

HISTORY AND CLINCICAL OBSERVATIONS:

KEEPER OBSERVATIONS: On By

CLINICIAN OBSERVATIONS: On 4/8/2017 By JSW

~18yo F GHLT with chronic history of diabetes mellitus until Oct 2014, cholestasis (with cholecystotomy in 2015 & removal of mucolith), splenomegaly and hepatomegaly with elevated hepatobiliary enzymes; more recent history of multiple tail tip amputations (3 total - 2/10/17, 2/22/17, 4/1/17), and severe chemosis OD since 3/31/17 unresponsive to PO antibiotics and anti-inflammatories. Diagnostic exam today failed to reveal cause for chemosis; metabolic disease largely unchanged; thoracic RADs revealed increased soft tissue opacity in L caudal lung fields on VD view (r/o atelectasis vs cardiac disease vs primary pulmonary disease vs other). Given multiple underlying conditions and overall poor quality of life, elected euthanasia. Euthanasia solution adminsitered IV via L femoral vein.

GROSS DESCRIPTION: On 4/10/2017 By ANC

Received is a 769.3 gram, adult, female, Golden-headed lion tamarin for necropsy on 8 April 2017. A subcutaneous transponder read "AVID 049*069*282." The carcass is in good postmortem condition and good body condition with well-fleshed muscles and abundant subcutaneous and intra-abdominal adipose stores. The tail is ~16 cm long and the distal 8 cm are sparsely haired. The distal end of the tail is amputated and the surgical site is dry and black and closed with nylon sutures.

All lung lobes are soft, mottled pink to dark red and float in formalin. The liver is diffusely enlarged with rounded lobe margins and an irregular, finely nodular capsular surface. All lobes are red-brown with fine, pale tan and dark red mottling. On cut section, many small bile ducts are prominent. The gall bladder is filled with mucoid, cloudy yellow-brown bile. Lymph nodes surrounding the extrahepatic bile ducts and pancreas are prominent and one is ~0.6 cm in diameter and dark red. The spleen is markedly enlarged (~10 cm long by 2 cm in diameter) and meaty with an irregular, finely nodular capsular surface with anastomosing trabeculae of firm white tissue (presumed fibrosis). Within the pancreas, at the junction of the gastric and duodenal limbs, there is an 0.8 cm diameter, soft to firm, well-demarcated mass that is mottled pale tan to red on cut section. In the corticomedullary junction of both kidneys, there are small cysts containing watery red fluid and the medulla is multifocally discolored pale tan, occasionally with a red rim of tissue or a central depression. The left renal pelvis is subjectively dilated. The stomach and small intestines contain scant mucus, the cecum contains soft, green, unformed feces with small (1-1.5 cm x <0.1 cm diameter), dark brown, twisted worms.

All teeth have moderate amounts of calculus and are irregularly pitted. The mandibular bone between the roots of the first and second right incisor teeth has a 1-2 mm diameter, hard, white swelling. The eyelids and conjunctiva of the right eye are mildly swollen, causing the eyelids to remain closed. There is a small, V-shaped, unpigmented notch in the medial aspect of the right superior eyelid. The right cornea is slightly cloudy and has an irregular surface with a subtle central depression. The pituitary gland is enlarged (0.4 cm diameter) causing it to bulge from the hypophyseal fossa and subtly compress the suprajacent thalamus.

The oral cavity, thyroid glands, trachea, esophagus, heart, diaphragm, adrenal glands, ovaries and uterus are grossly unremarkable.

GROSS DIAGNOSIS: By ANC

Diffuse hepatopathy (suspect cholangitis/cholangiohepatitis)
Splenomegaly with capsular fibrosis
Bilateral nephropathy (suspect chronic nephritis)
Pancreatic mass
Enlarged pituitary gland
Chemosis and corneal opacity, right eye
Cecal nematodiasis
Moderate dental calculus
Tail amputation

LABORATORY STUDIES:

OTHER: Bile swab refrigerated

TISSUE STATUS:

SHELVED:	False
TRIMMED:	True
FROZEN:	False
ULTRAFROZEN:	True

Tissues Ultrafrozen: Liver, lung, spleen, kidney,

SPECIAL REQUESTS: On By

HISTOLOGY: On 5/9/2017 By ANC

1. PITUITARY GLAND: The pars nervosa and distalis are crowded out by densely cellular, well-demarcated, expansile neoplastic mass that is composed of cords and nests of neoplastic cells surrounded by thin fibrovascular septa. Neoplastic cells occasionally palisade around blood vessels, forming pseudorosettes. Individual cells have indistinct borders, are polygonal to elongate, have moderate amounts of granular amphophilic cytoplasm and an oval nucleus with finely stippled chromatin and inapparent nucleoli. Anisocytosis and anisokaryosis are moderate; there is approximately 1 mitotic figure per 400x field. Fibrous trabeculae throughout the mass are often infiltrated by pigment-laden macrophages and few lymphocytes.

2. BRAIN, CEREBRUM; CEREBELLUM; BRAINSTEM: Multifocally, there are nodules of hyperplastic meningothelial cells. Focally in the grey matter of the brainstem, there is a small aggregate of pigment-laden macrophages and gliosis.

3. BRAIN, CEREBRUM, THALAMUS: The space that held the pituitary gland is enlarged. Within the hypothalamus dorsal to the gland and the piriform lobes lateral to the gland, there are aggregates of pigment-laden macrophages. A similar aggregate is present in the cerebellar white matter.

4. BRAIN, CEREBRUM; MIDBRAIN: WNL.

5. LUNG: Many alveoli are flooded with proteinaceous fluid (presumed postmortem artifact). Alveolar septa contain scattered megakaryocytes (extramedullary hematopoiesis). There is a small focus of osseous metaplasia in the parenchyma. Pulmonary arteries are congested and surrounded by small numbers of pigment-laden macrophages.

6. KIDNEY; HEART: Diffusely, the interstitium of the kidney is markedly infiltrated by a mixed population of leukocytes, including myeloid and erythroid precursors, band and segmented neutrophils (extramedullary hematopoiesis), and fewer macrophages, lymphocytes, plasma cells and extracellular brown pigment (presumptive hemosiderin). Infiltrates form dense sheets that separate and surround tubules and glomeruli and breech the renal capsule, where they are accompanied by pigment-laden macrophages and hyperplastic lymphoid aggregates. In the cortex, infiltrates are occasionally separated by collagen bundles. Many tubules are shrunken and atrophic or lined by attenuated epithelium and filled with protein casts and cellular casts. Glomeruli often have periglomerular fibrosis and the mesangium is segmentally expanded by homogeneous eosinophilic matrix. In the adipose adjacent to a large elastic artery, there are dense aggregates of lymphocytes that form vague follicles but lack an obvious capsular lining. Intervening between lymphoid tissue, there are populations of megakaryocytes and granulocyte precursors (extramedullary hematopoiesis), erythrocytes and fewer plasma cells and macrophages.

7. KIDNEY; HEART: The kidney is affected as previously described. Multifocally in the myocardium, there are groups of myofibers with hypereosinophilic sarcoplasm with contraction bands (terminal necrosis).

8. LIVER; SPLEEN: Diffusely in the liver, hematopoietic elements infiltrate, expand and accentuate portal tracts and extend into sinusoids where hepatic cords are often attenuated. Infiltrates occasionally surround rounded hepatic lobules that lack a central vein (regeneration). Portal tracts have increased fibrillar collagen and increased profiles of bile ductules, which are often dilated and contain proteinaceous fluid and rare bile plugs. There are few intracanalicular bile plugs and marked anisokaryosis of hepatocytes. Diffusely in the splenic red pulp, there are patchy aggregates of hematopoietic elements. As in the kidney, hematopoietic cells multifocally breech the capsule and accompanied by erythrocytes and extracellular and intra-macrophagic brown pigment.

9. LIVER; GALLBLADDER; BILE DUCTS; LYMPH NODE, HEPATIC; PANCREAS: The liver is as previously described. The hepatic capsule is undulated and segmentally fibrotic. Hematopoietic elements extend into the perihepatic adipose. The walls of the gallbladder and extrahepatic bile ducts are diffusely infiltrated by few lymphocytes, plasma cells and myeloid precursors. Multifocally within the wall of the gall bladder, there are small granulomas centered on bile concretions and granular mineral. The lumen of bile ducts and the gall bladder contain basophilic fluid (presumptive bile) in homogeneous laks and laminated concretions along with granular basophilic mineral. Lymph node sinuses have small numbers of hematopoietic elements. In the pancreas, many endocrine islets are markedly enlarged due to increased numbers of islets cells. Few enlarged islets (largest) are surrounded by a thin fibrous capsule and subtly compress the surrounding parenchyma (adenomas), although most are unencapsulated and not compressive (islet hyperplasia). Within the large adenoma, fibrous trabeculae are occasionally thickened by collagen bundles and hyalinized homogeneous eosinophilic matrix infiltrated by hemosiderin-laden macrophages, multinucleate giant cells and few lymphocytes. In some islets, blood vessels are dilated and congested. There are few aggregates of hematopoietic elements in endocrine islets.

10. SPLEEN; PANCREAS; DUODENUM; BILE DUCT; LYMPH NODE, PANCREATIC: The spleen is as previously described, with marked circumferential disruption of the capsule by hematopoietic elements. Pancreatic islets are enlarged and numerous as previously described. Pancreatic lymph node sinuses have scattered hematopoietic elements. Diffusely, few eosinophils infiltrate the duodenal lamina propria.

11. STOMACH; SMALL INTESTINE; ADRENAL GLANDS: There are scattered lymphocytes, plasma cells and eosinophils in the gastric mucosa. The small and large intestinal lamina propria has mild diffuse eosinophilic infiltrates.

12. ILEUM; CECUM; COLON; THYROID GLANDS; TRACHEA; ESOPHAGUS: The intestinal lamina propria is inflamed as previously described. In one thyroid lobe, there is a collection of variably sized follicles lined by plump epithelium and containing variable amounts of colloid. The nodule is surrounded by thin rim of fibrous tissue and subtly compress surrounding follicles.

13. OVARIES; UTERUS; VAGINA; URINARY BLADDER: The ovaries contain hematopoietic elements but no developing follicles. Few mucosal glands are cystically dilated in the vagina. Few neutrophils transmigrate the vaginal surface epithelium and few lymphocytes and plasma cell infiltrate the subtending stroma. In the urinary bladder, the subepithelial stroma is infiltrated by few neutrophils, lymphocytes and plasma cells.

14. EYELIDS, LEFT: There are rare plasma cells in the subepithelial stroma of the palpebral conjunctiva.

15. EYELIDS, RIGHT: Few neutrophils infiltrate the palpebral conjunctival epithelium and underlying stroma, along with few plasma cells.

16. EYE, LEFT: Within the anterior and vitreous chambers, there is foreign debris, nucleated erythrocytes and rafts of degenerate cells with embedded bacteria (board contamination).

17. EYE, RIGHT: A large central portion of the cornea is absent (sectioning artifact). The peripheral corneal epithelium is infiltrate by few to moderate numbers of neutrophils. Rostral scleral and conjunctival blood vessels are surrounded by few lymphocytes and plasma cells.

18. TAIL, AMPUTATION SITE: The distal tip is variably ulcerated, overlain by a serocellular crust and necrotic (both the epidermis and underlying dermal collagen). The epidermis bordering this site is hyperplastic. The deeper dermis, subcutis and perimysium are expanded by variably amounts of hemorrhage admixed with fibrin, many neutrophils, fewer macrophages, edema, necrotic cellular debris, devitalized collagen bundles and necrotic myofibers. Inflammation, edema and hemorrhage track proximally along the subcutis and fascia surrounding blood vessels, skeletal muscle, tendons and bone, for at least 3 cm (end of section). Marrow cavities in coccygeal vertebrae have ~10-20% hematopoietic elements with trilineage development.

19: TAIL: As previously described.

20: SKULL, NASAL CAVITY, ORBIT, TEETH (CRANIAL): In the nasal turbinates, scattered neutrophils infiltrate the surface epithelium, lamina propria and nasal gland lumina. The lamina propria has few plasma cells and lymphocytes. Similar infiltrates are scattered in paranasal sinuses, where gland are occasionally ectatic and contain proteinaceous fluid. Marrow cavities contain up to ~60% hematopoietic elements with trilineage development. In gingival sulci surrounding teeth, few neutrophils infiltrate the stratum corneum and underlying stroma is infiltrated by few neutrophils, plasma cells and lymphocytes.

21. SKULL, NASAL CAVITY, ORBIT, TEETH (MID-LEVEL); BRAIN, OLFACTORY BULB: As previously described.

22. SKULL, NASAL CAVITY, ORBIT, TEETH (CAUDAL): As previously described.

MORPHOLOGIC DIAGNOSIS:

1) Adipose, kidneys, liver, spleen, lymph nodes, pancreas, ovary: Extramedullary hematopoiesis (see comment)
2) Kidney: Moderate, multifocal, chronic, tubular atrophy with proteinaceous and cellular casts
3) Tail: Moderate, regionally extensive, subacute, necrotizing, hemorrhagic and suppurative dermatitis, cellulitis and myositis
4) Liver: Mild, multifocal, portal bridging fibrosis with biliary hyperplasia, cholestasis and nodular hepatic regeneration (biliary cirrhosis)
5) Gallbladder, bile ducts: Mild, chronic, diffuse cholecystitis and cholangitis with intraluminal bile concretions and intramural bile granulomas
6) Pituitary gland: Pars intermedia adenoma
7) Pancreas: Multiple islet cell adenomas and marked multifocal islet cell hyperplasia
8) Thyroid gland: Follicular adenoma
9) Kidney: Focal, segmental membranous glomerulopathy and periglomerular fibrosis
10) Eye, left: Mild, diffuse, subacute keratoconjunctivitis
11) Nasal turbinates, paranasal sinuses: Mild, multifocal to diffuse, acute, neutrophilic rhinitis and sinusitis with gland ectasia
12) Gingiva: Mild, multifocal, chronic gingivitis
13) Brain, thalamus, cerebrum: Mild, multifocal, chronic gliosis and hemosiderosis
14) Intestine: Mild, diffuse, eosinophilic enterocolitis

REMARKS: On 5/9/2017 By ANC

5/9/17: The clinically noted hepatic and splenic enlargement is due to marked proliferation of

hematopoietic cells, that was also occurring in several other organs. Hematopoietic elements consist of all three lineages with normal maturation, which, in conjunction with the absence of myelofibrosis, leukocytosis, polycythemia or thrombocythemia, suggests an exuberant but non-neoplastic process rather than chronic myeloproliferative disease/leukemia. However, in the liver and kidney, the proliferating cells appear to crowd out and cause atrophy of normal hepatic cords and renal tubules. Although this appears to be an exagerated and pathologic condition, it is also possible that hematopoiesis represents an appropriate physiologic response to chronic neutrophilic inflammation (likely due to chronic tail wound and cholangitis). There is one report of exuberant extramedullary hematopoiesis mimicking metastatic neoplasia in the liver and spleen of a Goeldi's monkey (1). Hepatobiliary changes are consistent with prior obstructive cholestasis, although disease was relatively mild at the time of death. Neuroendocrine adenomas were present in the pituitary gland, thyroid gland and pancreas, consistent with Multiple Endocrine Neoplasia (MEN). Pancreatic islet cell hyperplasia, congestion and hemosiderosis are suggestive of insulin-resistance, which, in some primates, may be related to high body weight and diabetes. Although the pituitary tumor seemed quite large at necropsy, histologic evidence of compression of the adjacent thalamus was limited to some mild chronic hemorrhage and there was no indication of optic nerve degeneration. Keratoconjunctivitis is suggestive of local irritation (mechanical/chemical); no infectious organisms were evident and there were no lesions within the extraocular tissues, bony orbit or maxillary tooth roots. The significance of membranous glomerulopathy is unknown; further work up of this lesion requires transmission electron microscopy. Despite looking relatively well-healed grossly, there was abundant inflammation and necrosis at the site of tail amputation that tracked several centimeters proximally along fascial planes, similar to the results of one previous tail biopsy (B17-0012).

1. Noiva, Rute Marina, et al. Extramedullary Hematopoiesis Mimicking a Neoplasm in a Goeldi's Monkey (Callimico goeldii). Journal of Life Sciences. December 2013, Vol. 7, No. 12, pp. 1228-1235.

Andrew Cartoceti	Andrew Cartoceti	5/9/2017
PROSECTOR	PATHOLOGIST	DATE COMPLETED

Pathology Module - Final Pathology Report
NATIONAL ZOOLOGICAL PARK

PATH # N2017-0058

Death Date: 4/10/2017
Necropsy Date: 4/10/2017

PARACHEIRODON AXELRODI
Cardinal tetra
Name:

Gender: Unknown Sex
Age:

Accession No.: 500808
Birth:
Acquired: 20 Oct 2014
31 Dec 2016

SEX: Unknown Sex AGE: ADULT WEIGHT: 0.4 gm STAY:

MANNER OF DEATH: Found Dead
TIME OF DEATH: 09:10A
DEATH LOCATION: FSA #6
SUBMITTOR: Dennis Charlton
OWNER/ANIMAL DEPT: DOA

INTERVAL: 0-6 hours
XRAYED: False
DISPOSITION: FORMALIN
PROSECTOR: Andrew Cartoceti

HISTORY AND CLINCICAL OBSERVATIONS:

KEEPER OBSERVATIONS: On 4/10/2017 By DC

0.0.1 cardinal tetra - found deceased in tank FSA #6. Appears thin. All other fish in tank are normal BAR.

Specimen submitted to pathology.

CLINICIAN OBSERVATIONS: On By

GROSS DESCRIPTION: On 4/10/2017 By ANC

Received is a 0.4 gram, adult, sex pending histology, Cardinal tetra for necropsy on 10 April 2017 after being found dead. The carcass is in good postmortem condition and has a total length of 3.6 cm. There is mild concavity to the ventral body wall. The fish is fixed whole to aid in histologic processing.

GROSS DIAGNOSIS: By ANC

No gross external lesions identified

LABORATORY STUDIES:

TISSUE STATUS:

SHELVED:	False
TRIMMED:	True
FROZEN:	False
ULTRAFROZEN:	False

Tissues Ultrafrozen:

SPECIAL REQUESTS: On By

HISTOLOGY: On 5/4/2017 By ANC

1. WHOLE BODY SECTIONS: There is mild to moderate autolysis with sloughing of the epidermis. One section of stomach contains plant debris in the lumen. Adipose stores are not identified.

MORPHOLOGIC DIAGNOSIS:

1) Body as a whole: Poor body condition

REMARKS: On 5/4/2017 By ANC

5/4/17: The only significant finding is poor body condition with a complete absence of adipose tissue. This fish is identified as a female on histology.

Andrew Cartoceti	Andrew Cartoceti	5/4/2017
PROSECTOR	PATHOLOGIST	DATE COMPLETED

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Pathology Module - Final Pathology Report
NATIONAL ZOOLOGICAL PARK

PATH # N2017-0063

Death Date: 4/18/2017
Necropsy Date: 4/18/2017

MUNGOS MUNGO (no subsp)
Banded mongoose
Name: Oak

Gender: Male
Age: 12Y 4M 20D
Chip: 462B0B1109

Accession No.: 114075
Birth: 29 Nov 2004
Acquired: 05 Jan 2006
Removed: 18 Apr 2017

SEX: Male AGE: 12Y 4M 20D WEIGHT: 1.33 kg STAY: > 30 Days

MANNER OF DEATH:Euthanasia
TIME OF DEATH:07:30A
DEATH LOCATION:WHS
SUBMITTOR:KLH
OWNER/ANIMAL DEPT:DOM - SMH

INTERVAL:0-6 hours
XRAYED:False
DISPOSITION:INCINERATE
PROSECTOR:Andrew Cartoceti

HISTORY AND CLINCICAL OBSERVATIONS:

KEEPER OBSERVATIONS: On By

CLINICIAN OBSERVATIONS: On 4/18/2017 By KLH

- Idiopathic pericardial effusion first diagnosed in 2014, intermittent clinical signs but generally asymptomatic. At most recent routine exam in December 2016, animal had 12ml of modified transudate tapped from pericardium, showing no other clinical signs of heart failure at that time. Presented with acute respiratory distress on 4/17/17. Tapped 30ml pericardial fluid, modified transudate (fluid analysis sent out to cornell). Ascites, pleural effusion, and pulmonary edema also present. Administered antibiotics, meloxicam and furosemide, and kept overnight in 40% oxyg
This morning, animal has increased respiratory effort and was lethargic. repeat films showed significant pulmonary edema (air bronchograms). Relatively small amount of pericardial effusion--unable to collect antemortem sample.

Animal was euthanized with 1.5ml euthasol IV.

Additional history: chronic hepatopathy, diabetes mellitus, spondylosis, alopecia

GROSS DESCRIPTION: On 4/18/2017 By ANC

Received is a 1330.5 gram, adult, male banded mongoose (transponder FDX-A 462B0B1109) for necropsy on 18 April 2017 following euthanasia. The carcass is in good postmortem condition and good body condition with well-fleshed musculature and adequate subcutaneous and intra-abdominal adipose stores. There is a ~7 x 5 cm area of shaved skin in the right thorax (ultrasonography/pericardiocentesis) and thinning of the fur along midline over the lumbar dorsum and cranial third of the tail.

The right jugular vein is thrombosed (euthanasia). The thoracic cavity contains ~20 - 30 mL of watery, slightly cloudy, red-brown fluid. Three sternal lymph nodes in the cranial mediastinum are prominent and pale tan with multiple red foci. The parietal and visceral pleura over the mediastinum, lungs, rib cage, pericardium and diaphragm is multifocally thickened and roughened by soft, raised, red to orange plaques and nodules. There are multiple thin fibrinous adhesions between the costal and pulmonary pleura and mediastinum. The pericardial sac and epicardium are diffusely thickened and translucent white. Multifocally, especially along the right ventricular free wall, there are dozens of coalescing, soft to firm, raised, nodular to plaque-like thickenings in the epicardium. The right atrium is dilated and filled with clotted blood. The lungs are diffusely reddened, rubbery and wet on cut section. The muscular portion of the diaphragm is thickened up to 3 cm thick.

The liver is subjectively large, but lobe margins are sharp. The hepatic parenchyma is red-brown with pinpoint pale yellow spotting and a slightly enhanced reticular pattern. The spleen is moderately enlarged and meaty. Both kidneys have a finely pitted capsular surface and linear streaking in the medullas. The urinary bladder contains ~1 mL of clear, yellow urine. The stomach contains abundant granular to pasty grey ingesta and meal worms. The small intestine contains scant pasty yellow ingesta and the colon has formed feces. There is moderate dental calculus and wearing of the teeth. The first and second left mandibular incisor teeth and the right maxillary canine tooth are absent.

The tongue, oral cavity, esophagus, trachea, thyroid gland, adrenal glands, mesenteric and cecal lymph nodes, brain, eyes, bone marrow, stifle joint and sciatic nerve are grossly unremarkable.

GROSS DIAGNOSIS: By ANC

Severe, diffuse, chronic pleuritis, pericarditis and epicarditis with pleural effusion
Moderate, diffuse, pulmonary edema
Right atrial dilation
Muscular hypertrophy, diaphragm
Diffuse hepatopathy
Splenomegaly
Multifocal alopecia, lumbar dorsum and tail
Moderate dental calculus and attrition

LABORATORY STUDIES:

TISSUE STATUS:

SHELVED:	False
TRIMMED:	True
FROZEN:	False
ULTRAFROZEN:	True

Tissues Ultrafrozen: Liver (2), kidney, pericardium, lung

SPECIAL REQUESTS: On By

HISTOLOGY: On 5/10/2017 By ANC

1. ADRENAL GLANDS; THYROID GLAND; THYMUS; LYMPH NODE, CRANIAL MEDIASTINAL, PERICARDIUM; URINARY BLADDER: The pericardium is multifocally and markedly thickened by multiple poorly-demarcated, densely cellular, non-encapsulated neoplastic masses. Masses are composed of dense sheets and clusters of variably sized, round cells that have a distinct cell margin with a brush border, large amounts of granular eosinophilic cytoplasm, one to three large round nuclei with finely stippled chromatin and one paracentral nucleolus. Anisocytosis and anisokaryosis are moderate to marked; mitotic figures are common (~1-3 per 400x field). Neoplastic cells often line and fill lymphatics in the pericardium and sinuses in the mediastinal lymph node. One mass in the lymph node is expanded by lakes of erythrocytes. Throughout the neoplastic populations and unaffected segments of the pericardium, there are many infiltrating lymphocytes, that often form dense follicles, pigment-laden macrophages, hemorrhage and fewer plasma cells. In the cortices of both adrenal glands, there are multiple, expansile, well-demarcated, non-encapsulated, neoplastic masses composed of well-differentiated adipocytes (lipomas). One thyroid follicle is greatly enlarged and filled with colloid. The pericardium is In the urinary bladder, rare submucosal blood vessels are surrounded by few lymphocytes and macrophages.

2. LUNG: The pleura is often thickened by papillary fronds of connective tissue lined by plump mesothelium (mesothelial hyperplasia), excess loose connective tissue that is variably edematous and infiltrated by scattered lymphocytes, pigment-laden macrophages, neutrophils, erythrocytes and mast cells, and fewer discrete nodules composed of dense sheets of neoplastic mesothelial cells (previously described). Pleural mesothelium is often plump (hypertrophic) and contains grey-brown cytoplasmic pigment (presumptive hemosiderin). Dense bands of plasma cells and lymphocytes infiltrate the subpleural pulmonary parenchyma. Alveoli are variably collapsed and filled with proteinaceous fluid (edema), increased numbers of macrophages, neutrophils and fewer erythrocytes. Few small aggregates of mineral expand alveolar septa. Alveolar and bronchiolar lumina rarely contain aggregates of granular to homogeneous basophilic material (possible inspissated surfactant). Medium caliber pulmonary arteries are occasionally surrounded by lymphocytes, plasma cells and pigment-laden macrophages. Alveolar capillaries contain rare megakaryocytes (extramedullary hematopoiesis).

3. TRACHEA; ESOPHAGUS; TONGUE; SCIATIC NERVE; SKELETAL MUSCLE, HINDLIMB: The adventitial surrounding the esophagus is multifocally expanded by neoplastic mesothelial nodules. Blood vessels in the superficial stroma of the tongue are surrounded by few lymphocytes, plasma cells and neutrophils.

4. HEART; RIGHT and LEFT FREE WALL, INTERVENTRICULAR SEPTUM: The epicardium of the right ventricular free wall is expanded by dense sheets of neoplastic mesothelium circumscribed by a thin fibrous capsule, dense sheets of lymphocytes and fibrosis. Tumor emboli are present in myocardial and epicardial lymphatics.

5. KIDNEY; SPLEEN: The capsular surface is undulating. The renal interstitium is multifocally infiltrated by lymphocytes and plasma cells and has tracts of condensed connective tissue. Some glomerular tufts are shrunken with dilated Bowman's spaces (obsolescent). Scattered tubules are dilated, filled with proteinaceous fluid and lined by attenuated epithelium. In the splenic red pulp, there are megakaryocytes and erythroid precursors (extramedullary hematopoiesis).

6. LIVER; GALLBLADDER: Sinusoidal Ito cells are numerous. Portal tracts are often infiltrated by plump macrophages with abundant pale grey-tan cytoplasm, plasma cells and few lymphocytes. Centrilobular sinusoids are mildly dilated and congested. There are small sinusoidal aggregates of lymphocytes.

7. STOMACH, CARDIA, PYLORUS; DUODENUM; PANCREAS; LYMPH NODE, HEPATIC: Focally, the gastric lamina propria is mineralized with surrounding neutrophils and macrophages. Dense sheets of macrophages infiltrate below and elevate gastric glands. Pancreatic islets are expanded and variably effaced by linear tracts of dense collagen that crowd out and entrap endocrine cells and is occasionally hyalinized. Few lymphocytes and rare neutrophils infiltrate fibrotic islets or surrounding interlobular septa. Lymph node sinuses are expanded by many plump macrophages with abundant, very pale brown cytoplasm.

8. STOMACH; DUODENUM; PANCREAS; JEJUNUM, ILEUM; CECUM; COLON; LYMPH NODE, CECOCOLIC: WNL.

9. SKIN, LUMBAR DORSUM; DIAPHRAGM; TRACHEA; ESOPHAGUS: In the skin, hair follicles are very sparse and often lack hair shafts. Sebaceous glands are absent and few lymphocytes multifocally infiltrate the superficial dermis around capillaries. One surface (pleural) of the diaphragm is expanded by neoplastic cells, lymphocytes, pigment-laden macrophages and fibrosis, as previously described in the pulmonary

pleura.

10. BONE MARROW; EYE: Marrow has ~60% hematopoietic elements with trilineage development.

11. BRAIN, CEREBRUM: WNL.

12. BRAIN, CEREBRUM, THALAMUS: WNL.

13. BRAIN, MIDBRAIN, HIPPOCAMPUS: WNL.

14. BRAIN, OLFACTORY BULB, CEREBRUM, CEREBELLUM, BRAINSTEM: WNL.

MORPHOLOGIC DIAGNOSIS:

1) Pleura, pericardium, epicardium, mediastinal lymph node: Mesothelioma with lymphatic invasion
2) Lung: Moderate, multifocal to diffuse, alveolar edema and neutrophilic alveolitis
3) Kidneys: Mild, multifocal, chronic, interstitial nephritis with interstitial fibrosis, glomerular obsolescence and tubular proteinosis
4) Pancreas: Moderate, multifocal islet fibrosis with islet cell atrophy and mild lymphocytic pancreatitis
5) Skin: Regional alopecia with adnexal (folliculosebaceous) atrophy and mild, lymphocytic, superficial dermatitis
6) Adrenal glands: Lipomatosis

REMARKS: On 5/10/2017 By ANC

5/10/17: Histology confirmed mesothelioma as the cause of recurrent cavitary effusion and the grossly observed plaques in the pleura and pericardium. Pancreatic islet fibrosis (and possible amyloidosis, stains pending) are consistent with diabetes mellitus. The liver is histologically unremarkable, except for some pigment accumulation in portal macrophages, which is likely a clinically insignificant,l age-related change. Splenomegaly is due to extramedullary hematopoiesis. Folliculosebaceous atrophy in the skin is suggestive of endocrine alopecia in domestic animals; however, some key histologic features (epidermal atrophy, hyperkeratosis) are missing and there was no morphologic evidence of signigicant disease in the thyroids or adrenal glands.

Andrew Cartoceti	Andrew Cartoceti	5/10/2017
PROSECTOR	PATHOLOGIST	DATE COMPLETED

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Pathology Module - Final Pathology Report
NATIONAL ZOOLOGICAL PARK

PATH # N2017-0064

Death Date: 4/19/2017
Necropsy Date: 4/19/2017

PHYLLOBATES TERRIBILIS
Golden poison dart frog
Name:

Gender: Unknown Sex
Age:

Accession No.: 307213
Birth:
Acquired: 07 Apr 2009
31 Dec 2016

SEX: Unknown Sex AGE: ADULT WEIGHT: 4.2 gm STAY: > 30 Days

MANNER OF DEATH: Found Dead
TIME OF DEATH: 07:00A
DEATH LOCATION: EML Holding
SUBMITTOR: Donna Stockton
OWNER/ANIMAL DEPT: DOA

INTERVAL: 0-6 hours
XRAYED: False
DISPOSITION: FORMALIN
PROSECTOR: Andrew Cartoceti

HISTORY AND CLINCICAL OBSERVATIONS:

KEEPER OBSERVATIONS: On 4/19/2017 By DS

Frog was skinnier than it tank mates. After separation into a holding tank, the frog was seen by James and treated. It still did not look very well and was found dead this morning.

CLINICIAN OBSERVATIONS: On By

GROSS DESCRIPTION: On 4/19/2017 By ANC

Received is a 4.2 gram, adult, suspected female, poison dart frog for necropsy on 19 April 2017 after being found dead. The carcass is in fair postmortem condition with generalized drying of the skin and curling of the toes and poor body condition with obvious bony prominences and no visible fat bodies. There is rigged extension of the left forelimb (presumed dehydration artifact). The right lung is fully inflated while the left lung is deflated. The liver is mottled pale tan and dark green. The eyes, oral cavity, heart, gallbladder, gastrointestinal tract, kidney and reproductive tract are grossly unremarkable.

GROSS DIAGNOSIS: By ANC

No significant gross lesions identified
Poor body condition

LABORATORY STUDIES:
CYTOLOGY: Feet

TISSUE STATUS:

SHELVED:	False
TRIMMED:	True
FROZEN:	False
ULTRAFROZEN:	True

Tissues Ultrafrozen: Feet, liver, colon

SPECIAL REQUESTS: On By

HISTOLOGY: On 5/11/2017 By ANC

1. HEART; LUNGS; LIVER; GALLBLADDER: Few granulocytes infiltrate the adventitia of great vessels and the epicardium. One lung is airspaces are hyperinflated and septa are thinned, while the other lung is atelectatic with contracted septa. In the liver, melanomacrophage centers are enlarged.

2. TONGUE; GASTROINTESTINAL TRACT; PANCREAS; SPLEEN; KIDNEY; URETERS; OVARY; OVIDUCT: The gastric lumen contains squamous epithelium (consumed shed). In the lumen of the intestine, there are plant cells, arthropod exoskeleton and few small (~100 um diameter), nematodes with lateral alae and a GI tract lined by many uninucleate enterocytes. Small intestinal enterocytes that are degenerating or sloughed often have discrete, eosinophilic, cytoplasmic inclusions. Small numbers of granulocytes infiltrate or form loose aggregates
In the serosa of the intestinal and reproductive tracts. In the pancreas, zymogen granules are mildly depleted, moderate number of granulocytes infiltrate lobules and few exocrine cells are replaced by karyorrhectic debris.

3. HEAD, EYES, BRAIN: Neutrophil-like granulocytes infiltrate the dorsal trabecular meshwork at the base of the iris leaflet and the corneal stroma of both eyes.

4. LEFT FORELIMB; FEET: WNL.

MORPHOLOGIC DIAGNOSIS:

1) Pancreas: Mild, multifocal, granulocytic pancreatitis with mild zymogen depletion
2) Coelom: Mild, multifocal, granulocyte coelomitis
3) Eyes: Mild, bilateral, acute, neutrophilic keratitis and anterior uveitis
4) Liver: Melanomacrophage hypertrophy
5) Intestine: Few intraluminal nematodes (presumptive Oxyurids)
6) Body as a whole: Poor body condition with minimal adipose

REMARKS: On 5/11/2017 By ANC

5/11/17: Histology revealed mild granulocytic inflammation in several locations (eyes, pancreas and coelom), that likely contributed to this animal's death. An underlying cause of inflammation is undetermined and infectious agents were not evident. Poor body condition with no recognizable fat and only small amounts of ingesta in the GI tract suggests a chronic decline. Intestinal nematodes are likely Oxyurids, which are considered part of the normal amphibian intestinal flora.

Andrew Cartoceti	Andrew Cartoceti	5/11/2017
PROSECTOR	PATHOLOGIST	DATE COMPLETED

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Pathology Module - Final Pathology Report
NATIONAL ZOOLOGICAL PARK

PATH # N2017-0065

Death Date: 4/19/2017
Necropsy Date: 4/19/2017

SEIURUS AUROCAPILLUS
Ovenbird
Name:

Gender: Male
Age: 2Y 10M 18D

Accession No.: 216491
Birth: 01 Jun 2014
Acquired: 18 May 2016
Removed: 19 Apr 2017

SEX: Male AGE: 2Y 10M 18D WEIGHT: 28 gm STAY: > 30 Days

MANNER OF DEATH: Died
TIME OF DEATH: 08:00
DEATH LOCATION: BH08
SUBMITTOR: Sara Hallager
OWNER/ANIMAL DEPT: DOO

INTERVAL: 0-6 hours
XRAYED: False
DISPOSITION: FORMALIN
PROSECTOR: Andrew Cartoceti

HISTORY AND CLINCICAL OBSERVATIONS:

KEEPER OBSERVATIONS: On 4/19/2017 By SH

Died following capture for routine weight (27g at time of death). No unusual observations prior to death

CLINICIAN OBSERVATIONS: On By

GROSS DESCRIPTION: On 4/19/2017 By ANC

Received is 27.0 gram, adult, suspected male ovenbird for necropsy on 19 April 2017 after death during capture. The carcass is in good postmortem condition and good body condition with well-fleshed pectoral muscles and abundant subcutaneous and intra-coelomic adipose stores. There is a green band on the right leg. The ventriculus contains gritty dark green-brown ingesta and the duodenum contains pasty pale tan ingesta. There is scattered, pinpoint intraosseous hemorrhage in the calvarium (agonal change). The eyes, oral cavity, trachea, esophagus, heart, liver, spleen, pancreas, intestinal tract and kidneys are grossly unremarkable.

GROSS DIAGNOSIS: By ANC

No significant gross lesions identified
Good body condition

LABORATORY STUDIES:
CYTOLOGY: Lung impressions

TISSUE STATUS:

SHELVED:	False
TRIMMED:	True
FROZEN:	False
ULTRAFROZEN:	True

Tissues Ultrafrozen: Liver, colon, kidney, lung

SPECIAL REQUESTS: On By

HISTOLOGY: On 5/11/2017 By ANC

1. LUNG; LIVER; KIDNEY; ADRENAL GLANDS: Rare hepatocytes have discrete, clear, cytoplasmic vacuoles (lipidosis).

2. TRACHEA; ESOPHAGUS; SMALL INTESTINE; PANCREAS: WNL.

3. HEART; BRONCHUS; ESOPHAGUS; VENTRICULUS; PROVENTRICULUS: WNL.

4. BRAIN: WNL.

5. PECTORAL MUSCLE: WNL.

6. HEAD, EYES, NASAL CAVITY: WNL.

MORPHOLOGIC DIAGNOSIS:

1) No histologic lesions identified

REMARKS: On 5/11/2017 By ANC

5/11/17: There were no histologic lesions identified that might have contributed to this bird's sudden death. Speculatively, excessive internal adipose stores may have crowded/compressed thoracic and abdominal air sacs, decreasing the bird's respiratory capacity and ability to breath sufficiently during a stressful capture event.

Andrew Cartoceti	Andrew Cartoceti	5/11/2017
PROSECTOR	PATHOLOGIST	DATE COMPLETED

Pathology Module - Final Pathology Report
NATIONAL ZOOLOGICAL PARK

PATH # N2017-0066

Death Date: 4/19/2017
Necropsy Date: 4/19/2017

BUCORVUS ABYSSINICUS	Gender: Female	Accession No.: 216157
Abyssinian ground hornbill	Age: 16Y 1M 9D	Birth: 10 Mar 2001
Name: Klarisse	Chip: 981020007264446	Acquired: 19 Oct 2012
		Removed: 19 Apr 2017

SEX: Female AGE: 16Y 1M 9D WEIGHT: 5.653 kg STAY: > 30 Days

MANNER OF DEATH: Found Dead
TIME OF DEATH: 06:15P
DEATH LOCATION: Lesser Kudu Yard
SUBMITTOR: Deb Grupenhoff
OWNER/ANIMAL DEPT: DOM - CCS

INTERVAL: 0-6 hours
XRAYED: False
DISPOSITION: INCINERATE
PROSECTOR: Tim Walsh

HISTORY AND CLINCICAL OBSERVATIONS:

KEEPER OBSERVATIONS: On 4/19/2017 By DG

AG Hornbill was found outside in exhibit shared with 1.2 lesser kudu. The weather was overcast and 60/65 degrees. At 11:30, she was offered mice, meatballs and crickets. She was sitting down by the lower exhibit near the public restrooms. I tossed her a mouse, which she did not take, but got up and snagged a moth from the grasses. I then urged her up to where the crickets were in log piles. She has laid two eggs, one on 4/15/17, which was found punctured later in the morning, and one on 4/16/17, which was soft. She was found next to the bird door to the holding area at 6:15pm.

CLINICIAN OBSERVATIONS: On By

GROSS DESCRIPTION: On 4/19/2017 By TFW

A 5.653 kg, 16 yr old, female hornbill found dead is necropsied 19 April 17. The carcass is in good to excellent postmortem condition with excessive stores of visceral adipose tissue but small subcutaneous and intramuscular deposits of adipose tissue. Muscling is good. Flight feathers on the right side are trimmed and there are occasional blood feathers. There are mild dark brown fissures in the keratin of the plantar surface of left hallux. The proximal right hallux has an approximately 4 mm diameter depression in the keratin with mild thickening of the proximal digit (presumptive mild pododermatitis). A 2 mm scabbed focus is on the partially feathered distended caudal celomic skin. The cloaca is hyperemic. There are thick intracoelomic deposits of adipose tissue obscuring and displacing organs. A pale yellow 5 mm roughly spherical loose nodule is in the coelom (presumptive old follicle). The liver is variably tan and hyperemic with rounded margins. The liver does not float in formalin. Thick adipose deposits surround the intestines. Adipose tissue overlying the area of the pancreas has paler almost white mottling compared to the surrounding adipose tissue. There are poorly discernible slightly firm nodules in the adipose tissue where the pancreas should be located though definitive pancreas is not obvious in the fat. The spleen is elongated, with rounded margins and mottled dark red to pink with numerous off white foci throughout. The spleen floats in formalin. The ventriculus is mildly distended with partially digested plant material, fibers, and small bone fragments (presumptive mice). The intestines have long congested villi. The kidneys are congested with occasional pale brown foci. The oviduct is enlarged with congested serosal vasculature. The ovary has numerous developing follicles with the largest up to 2 cm diameter. The epicardium is mildly opaque. The lungs are grey pink and exude cloudy fluid on section. Pooled blood is mildly cloudy and develops a prominent white layer on prolonged settling (lipemia). Spun postmortem blood develops laminar, completely opaque serum layers. The brain (mild meningeal congestion), eyes, thyroids, esophagus, trachea, and joints are grossly normal.

GROSS DIAGNOSIS: By TFW

1. Excessive coelomic adipose tissue
2. Lipemia, severe
3. Liver and spleen: moderate to severe lipidosis
4. Focal,mild, celomic granuloma (presumptive yolk related)
5. Mild, multifocal, chronic pododermatitis

LABORATORY STUDIES:

TISSUE STATUS:

SHELVED:	False
TRIMMED:	True
FROZEN:	False
ULTRAFROZEN:	True

Tissues Ultrafrozen: Lung, liver, kidney, spleen, serum

SPECIAL REQUESTS: On By

HISTOLOGY: On 6/1/2017 By ANC

1. LUNG: Scattered parabronchi lumina contain proteinaceous fluid and histiocytes (edema). Pulmonary capillaries are hypoperfused. Few lymphocytes surround some large vessels. Adjacent to smooth muscle trabeculae that line parabronchi, there are aggregates of macrophages that contain variably refractile, grey-brown granular pigment. The surface of some sections contain many robust adipocytes.
2. LIVER; GALLBLADDER: Portal tracts are expanded by dense sheets of developing granulocytes (extramedullary hematopoiesis). Approximately 95% of hepatocytes have cytoplasm containing many small, discrete, clear vacuoles (lipidosis). Portions of rare hepatic acini are spared of vacuolar change. In the submucosa of the gallbladder, few lymphocytes and plasma cells surround blood vessels.
3. SPLEEN; KIDNEY: Throughout the spleen, there are variably sized (up to 500 um diameter) cystic spaces that contain small amounts of lacy to spicular eosinophilic material with clear acicular clefts (intravascular cholesterol). There are many sheets of macrophages throughout the red pulp that contain one or more, discrete, clear cytoplasmic vacuoles. Arteries in the spleen have thickened tunica media.
4. KIDNEY; ADRENAL GLAND: In the interstitium of one adrenal gland, there are scattered myeloid precursors (extramedullary hematopoiesis). Arteries in the adrenal gland have thickened tunica media.
5. THYROID GLANDS; ULTIMOBRANCHIAL GLAND; THYMUS; CAROTID ARTERIES; ADRENAL GLAND; OVARIES: Within the ovaries, there are follicles at all stages of development. Scattered heterophils infiltrate the ovarian stroma and blood vessels in the ovarian pedicle and coelomic peritoneum are surrounded by few heterophils, lymphocytes and plasma cells.
6. HEART, RIGHT and LEFT FREE WALL: WNL.
7. HEART, INTERVENTRICULAR SEPTUM, LEFT ATRIUM and VENTRICLE: Few lymphocytes infiltrate the interstitium surrounding larger blood vessels in the myocardium and epicardium.
8. OVIDUCT; COELOMIC MASS: Few macrophages infiltrate the lamina propria, muscularis and serosa of the oviduct. A large mature granuloma is composed of a core of degenerate erythrocytes, amorphous to spicular eosinophilic material surrounded by a rim of few heterophils and many foamy macrophages, and further circumscribed by a rim of fibrous connective tissue.
9. ESOPHAGUS; PROVENTRICULUS; VENTRICULUS: The connective tissue of the esophageal adventitia and the subepithelium of overlying air sac is infiltrated by many macrophages, heterophils and fewer plasma cells and lymphocytes. The lamina propria underlying the superficial mucosa of the proventriculus is diffusely infiltrated by heterophils, lymphocytes and fewer plasma cells. Focally, there is a developing heterophilic granuloma within the inflamed lamina propria. Segmentally, foamy macrophages, some of which have engulfed yolk protein, heterophils and erythrocytes line the serosal surface of the proventriculus, replace mesothelium and infiltrate the underlying connective tissue. Blood vessels in the serosa are surrounded by lymphocytes and plasma cells.
10. VENTRICULUS; SMALL INTESTINE: Segmentally, blood vessels in the lamina propria and submucosa are surrounded by heterophils and the overlying koilin layer contains excess mucus. The mesothelial lining overlying the intestinal mesentery and serosa is inflamed as described in the proventriculus.
11. SMALL INTESTINE: The serosal lining of the intestine and mesentery is inflamed as described in the proventriculus. The intestinal lamina propria contains few heterophils.
12. INTESTINE; PANCREAS: The serosal lining of the intestine and mesentery is inflamed as described in the proventriculus. The intestinal lamina propria contains few heterophils. In one section of pancreas, the normal exocrine acini are replaced by dilated acini/ducts that are lined by flattened cells and have an empty clear lumen. Rarely there are remnant nests of normal exocrine cells. Islets are unaffected or are enlarged due to increased numbers of endocrine cells. Focally within the pancreatic parenchyma, there is a large core of eosinophilic acellular material admixed with eosinophilic, radiating, birefringent crystals and necrotic cellular debris. This is surrounded by foamy and epithelioid macrophages, multinucleated giant cells and and heterophils and further circumscribed by fibrous connective tissue with plump fibroblasts and infiltrating macrophages and fewer heterophils and lymphocytes (granuloma; possible obstructed pancreatic duct). IMMUNOHISTOCHEMISTRY: See scanned document.
13. CLOACA; OVIDUCT; COLON: Diffusely, the lamina propria of the distal oviduct is infiltrated by heterophils and fewer plasma cells. Scattered heterophils infiltrate the lamina propria of the colon. The serosal lining of the intestine and mesentery is inflamed as described in the proventriculus.
14. VENT: Heterophils, lymphocytes and fewer plasma cells diffusely infiltrate the lamina propria of the cloaca. Blood vessels in the dermis of the vent and perineum are surrounded by dense aggregates of lymphocytes and fewer heterophils.
15. SKELETAL MUSCLE; FOOTPAD; TRACHEA; ESOPHAGUS: The footpad epithelium is broadly ulcerated and overlain with a crust of serum, degenerate heterophils and superficial bacteria. The underlying dermis contains edema, many heterophils, fewer macrophages and plump fibroblasts. Large dermal arterioles are surrounded by many lymphocytes and fewer heterophils and plasma cells.
16. BRAIN: WNL.
17. BRAIN: WNL.
18. BRAIN: WNL.
19-1. BRAIN; PITUITARY GLAND: Some pituitary gland acini contain concretions of mineral.
19-2. BRAIN: Some neurons in brainstem nuclei have brightly eosinophilic cytoplasmic vacuoles.
20. EYE: WNL.
21. EYE: WNL.
22. PANCREAS; DUODENUM: As described in slide 12. There are multiple cross-sections through the described granuloma, both within pancreas and in the adipose between the pancreas and duodenum (suspected obstructed pancreatic duct).
23. PANCREAS; DUODENUM: As described in slide 22.

MORPHOLOGIC DIAGNOSIS:

1) Liver, spleen: Severe, diffuse, lipid-type vacuolar change (presumptive lipidosis)
2) Pancreas: Severe, regionally extensive, chronic exocrine atrophy with multifocal, chronic, granulomatous pancreatitis/dochitis
3) Coelom: Mild, multifocal, chronic coelomitis with intracellular yolk protein (yolk coelomitis)
4) Airsac: Mild to moderate, chronic, focally extensive, histiocytic airsacculitis
5) Footpad: Moderate, chronic, focally extensive, ulcerative pododermatitis

6) Proventriculus: Mild, diffuse, chronic, heterophilic and lymphocytic proventriculitis with focal heterophilic granuloma
7) Oviduct: Mild, segmental, heterophilic and plasmacytic salpingitis
8) Intestines, cloaca: Mild, diffuse, heterophilic enterocolitis and cloacitis
9) Gallbladder: Mild, multifocal, chronic, lymphoplasmacytic cholecystitis

REMARKS: On 6/1/2017 By ANC

6/20/17: Histology confirmed severe lipidosis within the liver and spleen, which is considered to be the most important factor contributing to acute death. Lipidosis has been reported to produce sudden death in some birds without any premonitory signs. Possible causes of lipidosis include excessive calorie consumption, inadequate fat utilization, hepatic enzyme defects, deficiency of dietary lipotrophs and toxic damage. Additionally, pancreatic lesions are consistent with an obstructed pancreatic duct with subsequent atrophy of the exocrine pancreas. Speculatively, this could have resulted in exocrine insufficiency and metabolic derangements that contributed to lipidosis. Other inflammatory diseases, including yolk coelomitis, pododermatitis and proventriculitis, are less severe but may have had an additive detrimental effect on this animal's health and metabolic state.

Tim Walsh	Andrew Cartoceti	6/1/2017
PROSECTOR	PATHOLOGIST	DATE COMPLETED

Printed on: 6/20/2017 2:24:24 PM CARES-MED v2.119

Pathology Module - Final Pathology Report
NATIONAL ZOOLOGICAL PARK

PATH # N2017-0067

Death Date: 4/20/2017
Necropsy Date: 4/20/2017

ECHINOPS TELFAIRI
Lesser Madagascar hedgehog tenrec
Name:

Gender: Female
Age: 1Y 8M 25D
Chip: 000782B32A

Accession No.: 115470
Birth: 26 Jul 2015
Acquired: 06 Apr 2017
Removed: 20 Apr 2017

On loan from SAN DIEGO WILD ANIMAL PARK, SAN DIEGO

SEX: Female | AGE: 1Y 8M 25D | WEIGHT: 101.2 gm | STAY: <= 30 Days

MANNER OF DEATH: Euthanasia
TIME OF DEATH: 11:50a
DEATH LOCATION: WHS
SUBMITTOR: JCS
OWNER/ANIMAL DEPT: DOM - SMH

INTERVAL: 0-6 hours
XRAYED: True
DISPOSITION: FORMALIN
PROSECTOR: Andrew Cartoceti

HISTORY AND CLINCICAL OBSERVATIONS:

KEEPER OBSERVATIONS: On By

CLINICIAN OBSERVATIONS: On 4/20/2017 By JCS

Entered quarantine on 4/6. During quarantine exam on 4/18 it was noted that this animal had mulifocal polyostotic in the appendicular skelelton most notably in both antebrachium. Keepers noted on 4/20 continued difficulty maneuvering around exhibit and inability to access the food dish. Due to concerns for infectious disease (mycobacteria and fungal disease) and quality of life concerns euthanasia was performed with euthasol via intracardiac injection.

GROSS DESCRIPTION: On 4/21/2017 By ANC

A 101.2 gram, adult, female lesser tenrec is necropsied on 20 April 2017 following euthanasia. A subcutaneous transponder reads TVN 000782B32A. The carcass is in good postmortem condition and good body condition with well-fleshed muscles and adequate subcutaneous and intra-abdominal adipose stores. There is mild generalized flaking of the skin. The left lung lobes are mottled pink to dark red and the right lung lobes are diffusely dark red-purple (euthanasia artifact). The stomach contains pasty to mucoid white ingesta and insect and worm parts. The small intestine contains scant pasty orange ingesta and the colon contains formed feces. There is moderate lateral deviation of the thoracic spine, creating an S-shaped curvature. The long bones of the fore and hindlimbs and ribs are expanded by coalescing, nodular, firm to hard, white swellings. There is minimal dental calculus on the teeth. The following tissues are grossly unremarkable: eyes, oral cavity, tongue, trachea, esophagus, thyroid gland, heart, liver, gallbladder, spleen, kidneys, adrenal glands, ovaries, uterus, urinary bladder and skeletal muscle.

GROSS DIAGNOSIS: By ANC

Bones, appendicular skeleton and ribs: Severe, diffuse, proliferative osteopathy
Bones, thoracic vertebrae: Scoliosis
Good body condition

LABORATORY STUDIES:

CYTOLOGY: Bone - DiffQuick and Acid-fast

TISSUE STATUS:

SHELVED:	False
TRIMMED:	True
FROZEN:	False
ULTRAFROZEN:	True

Tissues Ultrafrozen: Liver, ribs, fore and hindlimb, kidney, lung

SPECIAL REQUESTS: On By

HISTOLOGY: On 5/19/2017 By ANC

1. RIBS: The cortices are multifocally expanded by well-organized, variably mineralized, predominantly lamellar bone that bulge from the periosteal surface and obscure the pre-existing cortical margin (wide osteoid seams). Occasionally, the cambium layer of the periosteum is thickened, overlying regions of superficial woven bone. Proliferating cells of the cambium layer dissect between surrounding skeletal myofibers. Medullary trabeculae are often thickened and crowd out marrow elements.

2. LUNG; KIDNEY; ADRENAL GLAND; SPLEEN; SALIVARY GLAND: Alveoli are flooded with proteinaceous fluid (postmortem/euthanasia artifact). The splenic red pulp has megakaryocytes (extramedullary

hematopoiesis).

3. BROWN and WHITE ADIPOSE; LIVER; GALLBLADDER: Centrilobular sinusoids are slightly dilated and congested. There are few small sinusoidal aggregates of lymphocytes and macrophages.

4. HEART; TRACHEA; ESOPHAGUS; TONGUE; LYMPH NODE, TRACHEOBRONCHIAL; THYROID: In the thyroid gland, many follicles are small, collapsed and lack colloid. Some parafollicular cells are prominent and plump.

5. STOMACH, SMALL and LARGE INTESTINE; PANCREAS: Multifocally, few eosinophils infiltrate the lamina propria and submucosa of the stomach and duodenum. Focally, a serosal arteriole is surrounded by lymphocytes and fewer neutrophils.

6. COLON; URINARY BLADDER; VAGINA; DIAPHRAGM: Large numbers of eosinophils amd rare mast cells infiltrate the wall of the vagina, predominantly in the musclularis and less intensely in the submucosa. There are no infiltrates/exudates in the mucosa or lumen. The vaginal squamous epithelium is lined by keratin colonized by bacteria.

7. OVARIES; UTERUS; EYES: There are developing follicles in the ovary. Rare eosinophils infiltrate the endometrial stroma.

8. BRAIN, OLFACTORY BULBS, CEREBRUM, THALAMUS, MIDBRAIN, CEREBELLUM, BRAINSTEM: WNL.

9. PITUITARY GLAND; SKULL: The cortical and medullary bone of the mandible is thickened, bilaterally, due to wide unmineralized osteoid seams.

10. RIBS, COSTOCHONDRAL JUNCTION: Bone is thickened as described previously. There is normal endochondral ossification at the physis and no retention of cartilage.

11. ANTEBRACHIUM: The cortices of the bones of the manus and antebrachium are markedly thickened, as described in the ribs. The physes are beginning to regress and have normal endochondral ossification.

12. BRACHIUM: The cortices of bones are markedly thickened, as described in the ribs.

13. SPINE, CERVICAL and THORACIC: The cortices of bones are markedly thickened, as described in the ribs.

14. HINDLIMB: The cortices of bones are markedly thickened, as described in the ribs.

MORPHOLOGIC DIAGNOSIS:

1) Bones, appendicular and axial skeleton: Marked multifocal cortical hyperostosis with abundant unmineralized osteoid
2) Vagina: Intraluminal keratin and bacteria

REMARKS: On 5/19/2017 By ANC

5/19/17: The histologic findings in the bones are consistent with osteomalacia, which is a type of metabolic bone disease that can be caused by anything that interferes with normal bone mineralization. Dietary deficiences in vitamin D and phosphorus are the most common causes in animals, but deficiences in calcium, gastrointestinal malabsorption, high dietary iron, aluminum and fluoride and hereditary forms of the disease are also documented. Further analysis of this animal's serum biochemistry, previous diet and genetic lineage are required to establish a definitive cause of osteomalacia in this case. Bacteria within the vaginal lumen do not appear to be illiciting any inflammatory response and are interpreted as incidental. Eosinophilic infiltrates in the vaginal wall are also interpreted as incidental as they can be a normal component of the estrus cycle of some animals. This case was reviewed with [redacted].

Andrew Cartoceti	Andrew Cartoceti	5/19/2017
PROSECTOR	PATHOLOGIST	DATE COMPLETED

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Pathology Module - Final Pathology Report
NATIONAL ZOOLOGICAL PARK

PATH # N2017-0075

Death Date: 5/3/2017
Necropsy Date: 5/3/2017

PARACHEIRODON AXELRODI
Cardinal tetra
Name:

Gender: Unknown Sex
Age:

Accession No.: 500808
Birth:
Acquired: 20 Oct 2014
31 Dec 2016

SEX: Unknown Sex AGE: ADULT WEIGHT: 0.8 gm STAY: > 30 Days

MANNER OF DEATH: Found Dead
TIME OF DEATH: 08:02A
DEATH LOCATION: FSA #6
SUBMITTOR: Dennis Charlton
OWNER/ANIMAL DEPT: DOA

INTERVAL: 0-6 hours
XRAYED: False
DISPOSITION: FORMALIN
PROSECTOR: Andrew Cartoceti

HISTORY AND CLINCICAL OBSERVATIONS:

KEEPER OBSERVATIONS: On 5/3/2017 By ANC

0.0.1 cardinal tetra - found deceased in tank FSA #6. All other fish in tank are normal BAR.

Specimen submitted to pathology.

CLINICIAN OBSERVATIONS: On By

GROSS DESCRIPTION: On 5/3/2017 By ANC

Received is a 0.8 gram, adult, female Cardinal tetra for necropsy on 3 May 2017 after being found dead. The carcass is in good postmortem condition and good body condition with well-fleshed muscles. The fish has a total length of 4.2 cm. The right body wall is soft, pale brown and friable (postmortem autolysis). The gills are pale pink and there are numerous ovarian follicles/eggs. The fish is fixed whole to aid in histologic processing. Gill and fin clip and skin scrape cytologies are unremarkable.

GROSS DIAGNOSIS: By ANC

No gross lesions identified

LABORATORY STUDIES:

CYTOLOGY: Skin scrap, gill clip, fin clip -- WNL.

TISSUE STATUS:

SHELVED:	False
TRIMMED:	True
FROZEN:	False
ULTRAFROZEN:	False

Tissues Ultrafrozen:

SPECIAL REQUESTS: On By

HISTOLOGY: On 6/7/2017 By ANC

WHOLE BODY, SKELETAL MUSCLE, BRAIN, SPINAL CORD, GILL, KIDNEY, OVARY, LIVER, GASTROINTESTINAL TRACT: Scattered myofibers have fragmented sarcoplasm that is infiltrated by few macrophages (necrotic). In the capsule of the liver, there is a small granuloma with a core of many developing spores that have a prominent clear polar vacuole (microsporidial xenoma). A similar xenom is within the ovary.

MORPHOLOGIC DIAGNOSIS:

1) Liver, ovary: Multiple microsporidial xenomas
2) Skeletal muscle: Minimal, multifocal, subacute, myofiber necrosis

REMARKS: On 6/7/2017 By ANC

6/7/17: At the severity observed (minimal to mild) both histologic diagnoses are considered incidental; however, if they were more widespread within unexamined regions of the fish they may have been contributors to death. Further identification of microsporidia requires electron microscopy and/or molecular techniques. Granulomas suggestive of mycobacteriosis were not evident.

Andrew Cartoceti	Andrew Cartoceti	6/7/2017
PROSECTOR	PATHOLOGIST	DATE COMPLETED

Pathology Module - Final Pathology Report
NATIONAL ZOOLOGICAL PARK

PATH # N2017-0076

Death Date: 5/3/2017
Necropsy Date: 5/3/2017

BASILISCUS PLUMIFRONS
Green crested basilisk
Name:

Gender: Male
Age: 8Y 1M 4D

Accession No.: 307228
Birth: 29 Mar 2009
Acquired: 24 Jun 2009
Removed: 03 May 2017

SEX: Male
AGE: 8Y 1M 4D
WEIGHT: 280.7 gm
STAY: > 30 Days

MANNER OF DEATH: Euthanasia
TIME OF DEATH: 10::30
DEATH LOCATION: w
SUBMITTOR: KLH
OWNER/ANIMAL DEPT: DOH

INTERVAL: 0-6 hours
XRAYED: False
DISPOSITION: INCINERATE
PROSECTOR: Andrew Cartoceti

HISTORY AND CLINCICAL OBSERVATIONS:

KEEPER OBSERVATIONS: On By

CLINICIAN OBSERVATIONS: On 5/3/2017 By KLH

Previous history of impacted right hemipene, surgical debridement in 2014.

Chronic weight loss, decreased appetite, muscle wasting. Liver abscess/granuloma found 4 weeks ago. Treated empirically with ceftazidime and metronidazole. Abscess appeared similar at recheck last week, cytology suggested mycobacterial infection. Based on clinical signs, age, and prognosis, euthanasia elected. Injected euthasol in tail vein and intracardiac.

GROSS DESCRIPTION: On 5/4/2017 By ANC

A 280.7 gram, adult, male green-crested basilisk is necropsied on 3 May 2017 following euthanasia. The carcass is in excellent postmortem condition and fair body condition with generalized skeletal muscle atrophy and pronounced bony prominences, but large fat bodies. Scattered throughout the skin of the entire body, there are small patches of retained shedding skin and few scales that are dark grey and irregular. The normal skin overlying the right hemipene at the base of the tail is replaced by 2.3 x 1.0 cm region of thickened, irregular, dark grey to white scales (dermal scar). Slightly rostral and dorsal to this lesion, a ~1 cm diameter region of skin is irregular, slightly raised and darkly pigmented (dermal scar). The right hemipene is absent and there are four, discrete, pale brown, firm nodules (up to 0.6 x 0.3 cm in diameter) within the skeletal muscle and subcutis (prior hemipene impaction and debridement). The lungs are soft, pale to dark pink and float in formalin. Within the center of the left liver lobe, there is a ~1.5 cm diameter, soft, pale brown mass that bulges slightly on cut section and has areas of green and pale yellow mottling and a ~1 x 0.5 x 0.5 cm focus of firm, friable, dull, dark red material (chronic hemorrhage) surrounded by a rim of pasty, pale yellow fluid. The cranial half of the pancreas is white and finely nodular. The kidneys are diffusely dark red-brown. The stomach contains insect parts and a piece of woody debris. The small intestine contains small amounts of watery pale brown fluid and the large intestine contains loosely formed, green-brown feces and a 2-3 mm diameter, hard, green bead. The eyes, brain, esophagus, trachea, heart, gallbladder, spleen, testes, bone marrow, sciatic nerve and coxofemoral and femorotibial joints are grossly unremarkable.

GROSS DIAGNOSIS: By ANC

Liver, left lobe: Focal mass with central necrosis and hemorrhage
Subcutis, skeletal muscle, ventral right tale base: Multifocal chronic granulomas (presumptive) with absent right hemipene
Body as a whole: Fair body condition with generalized muscle atrophy

LABORATORY STUDIES:

CULTURE: Liver mass - aerobic
CYTOLOGY: Liver mass

TISSUE STATUS:

SHELVED:	False
TRIMMED:	True
FROZEN:	False
ULTRAFROZEN:	True

Tissues Ultrafrozen: Liver (2), lung, kidney, colon

SPECIAL REQUESTS: On By

HISTOLOGY: On 6/8/2017 By ANC

1. LUNG; SPLEEN; TESTES; ADRENAL GLAND; PANCREAS: There is active spermatogenesis in the testes. Medium caliber arteries adjacent to the spleen and pancreas have circumferential intimal fibrosis and mineralization. Exocrine pancreatic cells have depleted zymogen granules. There are few heterophils and pigment-laden macrophages in the splenic red pulp.

2. LIVER: The normal hepatic parenchyma is compressed by a large, expansile, well-demarcated, encapsulated neoplastic mass composed of cords of polygonal cells that recapitulate hepatic cords/sinusoids but lack portal tracts and melanomacrophage centers. Individual cells have distinct borders, large amounts of granular eosinophilic cytoplasm and a round nucleus with finely stippled chromatin and one paracentral nucleolus. Anisocytosis and anisokaryosis is moderate to marked; mitoses are rare. Many neoplastic cells contain a variably sized, eosinophilic, intracytoplasmic inclusion. There is scattered single cell death, small areas of necrosis and a large central granuloma with a core of hemorrhage. In the normal liver, melanomacrophage centers are increased in density and size, due to increased numbers of cells. Diffusely, hepatocytes have one or more discrete, clear, cytoplasmic vacuole (presumptive lipidosis).

3. LIVER; KIDNEY; GALLBLADDER: Rarely, there are small sinusoidal aggregates of lymphocytes.

4. STOMACH; PANCREAS; SMALL INTESTINE; CECUM; COLON; HEMIPENE, LEFT: Some serosal/mesenteric blood vessels have intimal/medial mineralization. A small granuloma in the peritoneum is centered on a core of acicular clear clefts (cholesterol). Within the lumen of the hemipene, there is a small aggregate of sloughed epithelial cells and few heterophils. There are increased numbers of lymphocytes in the colonic lamina propria.

5. STOMACH; HEART: The gastric mesentery adjacent to the pancreas is regionally expanded by multiply coalescing granulomas that are centered on cholesterol clefts (cholesterol granulomas/xanthoma). There is multifocal mineralization of the tunica media of the great vessels. Few lymphocytes form loose aggregates in the gastric lamina propria.

6. TRACHEA; ESOPHAGUS; SKIN, TAILBASE; HEMIPENE, RIGHT: A large artery adjacent to the trachea/esophagus has the previously described changes as well as few macrophages infiltrating the adventitia. In the subcutis in the region of the right hemipene, there are mature granulomas with a core of abundant necrotic cellular debris and islands of stratified squamous epithelium with a lumen containing keratin and abundant coccoid bacteria.

7. BRAIN: Multifocally, there is scattered clear vacuolation of the grey and white matter.

8. HEAD, EYES: WNL.

9. HEAD, NASAL CAVITY: Focally, lymphocytes infiltrate the oral mucosa and underlying lamina propria.

SPECIAL STAINS:
Slide 2: B&H, ACID-FAST, GMS: There are no bacteria or fungal elements evident.
Slides 5 and 6: ACID-FAST: There are no acid-fast bacteria evident.

MORPHOLOGIC DIAGNOSIS:

1) Liver: Hepatocellular adenoma/well-differentiated carcinoma with intralesional granuloma
2) Blood vessels: Moderate, multifocal to circumferential intimal fibrosis and mineralization
3) Subcutis, right tailbase: Moderate, multifocal, chronic granulomatous cellulitis
4) Subcutis, right tailbase: Focal epithelial inclusion cyst with intraluminal coccoid bacteria
5) Mesentery, gastroduodenal: Focally extensive cholesterol granuloma/xanthoma
6) Liver: Diffuse vacuolar hepatopathy (lipid-type)
7) Liver: Melanomacrophage hyperplasia

REMARKS: On 6/16/2017 By ANC

6/16/17: In the absence of demonstrable infectious agents within the hepatic granuloma, this lesion may represent the necrotic center of a rapidly growing tumor. This concludes all diagnostic testing.

6/8/17: The majority of the mass within the liver consists of a neoplasm derived from hepatocytes; however, within the center of the mass is granuloma that is suspicious for an infectious etiology. Aerobic culture of the granuloma yielded no growth. Special stains for acid-fast organisms, bacteria and fungi are pending. Inclusions within neoplastic cells likely represent aggregated host protein as similar globular inclusions have been noted in human and mice liver tumor cells. Alternatively, these inclusions could indicate a viral etiology, although there are no reported virally-induced liver tumors in reptiles. The granulomas and epithelial cyst in the subcutis at the tail base represent residual lesions from prior right hemipene impaction and debridement.

Andrew Cartoceti	Andrew Cartoceti	6/16/2017
PROSECTOR	PATHOLOGIST	DATE COMPLETED

Pathology Module - Final Pathology Report
NATIONAL ZOOLOGICAL PARK

PATH # N2017-0077

Death Date: 5/2/2017
Necropsy Date: 5/4/2017

GRUS VIPIO
White-naped crane
Name:

Gender: Unknown Sex
Age: 0Y 0M 0D

Accession No.: 216586
Birth: 02 May 2017
Acquired:
Removed: 02 May 2017

SEX: Unknown Sex AGE: 0Y 0M 0D WEIGHT: 189.5 gm STAY:

MANNER OF DEATH: Died
TIME OF DEATH: 12:00P
DEATH LOCATION: SCBI Crane yard C-3
SUBMITTOR: Chris Crowe
OWNER/ANIMAL DEPT: DCO

INTERVAL: 48-72 Hours
XRAYED: False
DISPOSITION: INCINERATE
PROSECTOR: Andrew Cartoceti

HISTORY AND CLINCICAL OBSERVATIONS:

KEEPER OBSERVATIONS: On 5/4/2017 By CC

-SCBI egg #27 was laid on March 31, 2017 in outdoor pen C-5 in Crane Yards. Product of artificial insemination involving white-naped crane dam #215327 and sire #216050
-Given to surrogate pair of 1.1 white-naped cranes #214146, 214147 for incubation on 4/1/17.
-Confirmed to be fertile on April 11, 2017 and was expected to hatch at 30 days of age on April 30, 2017.
-Candled egg on May 1 and was unable to discern any movement. Placed in incubator.
-Candled and floated egg on May 2nd - no movement. Placed in refrigerator.

CLINICIAN OBSERVATIONS: On By

GROSS DESCRIPTION: On 5/5/2017 By ANC

A 189.5 gram white-naped crane egg is necropsied on 4 May 2017 after failing to hatch. Writen on the egg shell in black marker is "216586." The egg contains a yolk sac surrounded by gelatinous clear albumin and further surrounded by abundant watery yolk material mixed with gelatinous clear debris. Closely associated with the yolk sac are irregular membranes of thin, translucent material (possible early embryo/vessels).

GROSS DIAGNOSIS: By ANC

No embryonic development or early embryonic death (see comment)

LABORATORY STUDIES:

TISSUE STATUS:

SHELVED:	False
TRIMMED:	True
FROZEN:	False
ULTRAFROZEN:	False

Tissues Ultrafrozen:

SPECIAL REQUESTS: On By

HISTOLOGY: On 6/1/2017 By ANC

1. YOLK: There is a mixture of variably autolyzed yolk protein and colonies of bacteria.

MORPHOLOGIC DIAGNOSIS:

1) No evidence of embryonic development

REMARKS: On 6/1/2017 By ANC

6/1/17: The histologic findings suggest that this egg was not fertile.

Andrew Cartoceti	Andrew Cartoceti	6/1/2017
PROSECTOR	PATHOLOGIST	DATE COMPLETED

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Pathology Module - Final Pathology Report
NATIONAL ZOOLOGICAL PARK

PATH # N2017-0078

Death Date: 5/5/2017
Necropsy Date: 5/5/2017

PRIONAILURUS VIVERRINUS
Fishing cat
Name: Electra

Gender: Female
Age: 12Y 9M 6D
Chip: 00-0631-2514

Accession No.: 114059
Birth: 29 Jul 2004
Acquired: 09 Nov 2005
06 Apr 2010
Removed: 05 May 2017

SEX: Female AGE: 12Y 9M 6D WEIGHT: 8.2 kg STAY: > 30 Days

MANNER OF DEATH: Euthanasia
TIME OF DEATH: 09:30A
DEATH LOCATION: Asia Trail
SUBMITTOR: Kendra
OWNER/ANIMAL DEPT: DOM - Asia Trail

INTERVAL: 0-6 hours
XRAYED: True
DISPOSITION: INCINERATE
PROSECTOR: Andrew Cartoceti

HISTORY AND CLINCICAL OBSERVATIONS:

KEEPER OBSERVATIONS: On By

CLINICIAN OBSERVATIONS: On 5/5/2017 By KB

On exam on 4/12, a bladder mass was noted on ultrasound exam. Treatment of the bladder mass (surgical excision and chemotherapy) was discussed with Asia trail staff. Due to concerns of previously diagnosed hepatopathy, chronic renal disease, age of the cat and ongoing quality of life concerns (abdominal discomfort, intermittent inappetance, lameness, and lethargy), euthanasia was elected. Euthasol and KCl were administered IV.

GROSS DESCRIPTION: On 5/5/2017 By ANC

A 8.2 kilogram, adult, intact female fishing cat (transponder 00061B2514) is necropsied on 5 May 2017 following euthanasia. The carcass is in excellent postmortem condition and good body condition with well-fleshed pectoral muscles and adequate subcutaneous and intra-abdominal adipose stores. There are multiple shaved regions of skin over venous access points (euthanasia). The omentum is multifocally adhered to the linea alba. The caudal esophagus is sutured to the diaphragm at the level of the esophageal hiatus and is surrounded by fibrous adhesions (historical esophagopexy). A ~3 cm diameter ring of nylon sutures fixes the greater curvature of the stomach to the left abdominal muscles and is surrounded by white fibrous adhesions (historical gastropexy). The liver is mildly enlarged with rounding of some lobe margins. Diffusely, the hepatic parenchyma is red-brown and has a subtle reticular pattern. Dozens of soft to firm, pale tan nodules expand the gastric and duodenal limbs of the pancreas. The kidneys have a subtly undulating capsular surface and few 2-3 mm diameter fluid filled cysts in the cortex. The urinary bladder is empty and there are no masses evident within the wall. There is a small (~0.5 cm diameter) region of mucosa approximately 2 cm cranial to the neck that is subtly irregular, thickened and white. The stomach is dilated and filled with abundant bamboo leaves, pasty grey fluid, fur and mouse limbs. The small intestine contains scant pasty grey to yellow ingesta and the colon contains abundant soft feces. The lungs are mottled pink to red to dark red, are soft and float in formalin. There is minimal dental calculus and mild dental wear. Examined joints (glenohumeral, humeroradial/ulnar, coxofemoral and femorotibial, bilaterally) have mild thinning of articular cartilage but no appreciable osteophytes, synovial hyperplasia or joint capsule thickening.

The oral cavity, eyes, brain, trachea, esophagus, thyroid glands, heart, adrenal glands, spleen, mesenteric lymph nodes, ovaries, uterus, vagina, skeletal muscle and sciatic nerve are grossly unremarkable.

GROSS DIAGNOSIS: By ANC

Urinary bladder: Mild, focal, mucosal cystopathy
Kidneys: Mild bilateral nephropathy (suspect chronic nephritis)
Liver: Mild hepatomegaly
Stomach: Abundant intraluminal bamboo leaves
Esophagus, diaphragm: Historical esophagopexy with chronic focal adhesion
Stomach, abdominal muscles: Historical gastropexy with chronic focally extensive adhesions
Joints (glenohumeral, humeroradial/ulnar, coxofemoral and femorotibial, bilaterally): Minimal degenerative joint disease
Body as a whole: Good body condition

LABORATORY STUDIES:

OTHER: Repro tract to Tricia Rowlison (Repro), returned in formalin on 5 May 17.

TISSUE STATUS:

SHELVED:	False
TRIMMED:	True
FROZEN:	False
ULTRAFROZEN:	True

Tissues Ultrafrozen: Liver (2), lung, kidney

SPECIAL REQUESTS: On By

HISTOLOGY: On 6/19/2017 By ANC

1. LUNG: Focally, few neutrophils and macrophages infiltrate the interstitium of alveolar septa and around blood vessels and extend into alveolar lumina along with small amounts of lacy fibrin. Aggregates of plump macrophages with granular, grey and refractile pigment within their cytoplasm surround airways. Scattered megakaryocytes are present in pulmonary capillaries.
2. ADRENAL GLANDS; THYROID GLANDS; BONE MARROW; PITUITARY GLAND; MESENTERIC LYMPH NODE; PANCREAS: Medullary sinuses in the lymph node have many plasma cells. Bone marrow is ~30-40% cellularity with trilineage development. In the pancreas, there are few enlarged exocrine lobules in which the interstitium contains many neutrophils and acinar cells have decreased zymogen granules (exocrine hyperplasia).
3. LIVER; GALLBLADDER; SPLEEN: Diffusely in the liver, hepatocytes have fine, feathery cytoplasm with occasional discrete, clear vacuoles. There are rare small aggregates of lymphocytes and macrophages within sinusoids; macrophages often have pale brown granular cytoplasmic pigment and/or discrete clear vacuoles (lipogranulomas). Portal tracts contain small aggregates of vacuolated macrophages and scattered lymphocytes. Focally, a dense aggregate of lymphocytes, plasma cells and macrophages expand a portal tract. Scattered sinusoidal Kupffer cell contain golden brown, granular, cytoplasmic pigment (presumed hemosiderin). The hepatic capsule is lined by cuboidal mesothelial cells. The splenic red pulp has scattered megakaryocytes and capsular mesothelial cells are plump and prominent.
4. KIDNEY: There are scattered infiltrates of lymphocytes and fewer macrophages, that sometimes form lymphoid follicles. Increased amounts of fibrillar collagenous tissue surround tubules and Bowman's capsule of glomeruli. Scattered tubules are markedly dilated.
5. HEART, RIGHT AND LEFT FREE WALLS, INTERVENTRICULAR SEPTUM, LEFT AURICLE: WNL.
6. SCIATIC NERVE; SKELETAL MUSCLE; DIAPHRAGM; STOMACH: Refractile suture material embedded within the stomach serosa and skeletal muscle are surrounded by mature, dense, fibrous connective tissue that is infiltrated by few neutrophils and lymphocytes.
7. OVARY; UTERUS; VAGINA: There are developing follicles wthin the ovary. Few lymphocytes infiltrate the surface epithelium and lamina propria of the vagina.
8. STOMACH, CARDIA; ESOPHAGUS, CRANIAL; URETERS: At the insertion on the stomach, moderate numbers of lymphocytes, plasma cells and neutrophils infiltrate the esophageal lamina propria and neutrophils transmigrate the surface epithelium. Gastric glands contain spiral bacteria.
9. ESOPHAGUS, MID; STOMACH, PYLORUS; DUODENUM; JEJUNUM: Focally, few eosinophils infiltrate beneath a nest of Brunner's glands.
10. ESOPHAGUS, CAUDAL; SMALL INTESTINE, DUODENUM; PANCREAS: Few plasma cells are present in the esophageal lamina propria. In the pancreas, there are proliferative lobules, two of which are surrounded by a fibrous connective tissue capsule (exocrine hyperplasia).
11. ILEUM; CECUM; COLON; URETHRAL NECK; URINARY BLADDER: WNL.
12. URINARY BLADDER: Small numbers of lymphocytes are scattered within the interstitium of the superficial bladder lamina propria and surround blood vessels.
13. BRAIN, CEREBRUM: WNL.
14. BRAIN, CEREBRUM, HIPPOCAMPUS: WNL.
15. BRAIN, CEREBRUM, MIDBRAIN: WNL.
16. BRAIN, CEREBELLUM, BRAINSTEM: WNL.
17. BRAIN, CEREBELLUM, BRAINSTEM: WNL.
18. EYE, LEFT: WNL.
19. URINARY BLADDER: As previously described.
20. URINARY BLADDER: As previously described.

MORPHOLOGIC DIAGNOSIS:

1) Kidney: Mild to moderate, multifocal, chronic, lymphoplasmacytic intersitial nephritis with periglomerular and peritubular fibrosis
2) Stomach, cardia; esphagus, caudal: Mild to moderate, regionally extensive, chronic esophagitis and gastritis
3) Stomach: Intraluminal and intraglandular spiral bacteria (suspect Helicobacter sp.)
4) Liver: Mild, diffuse vacuolar hepatopathy (lipid and glycogen-type)
5) Liver: Mild, multifocal, chronic lymphohistiocytic portal and random hepatitis with lipogranulomas
6) Pancreas: Multifocal nodular exocrine hyperplasia

REMARKS: On 6/19/2017 By ANC

6/19/17: Gross and histologic examination of the bladder did not reveal a mass or significant abnormality (only small amounts of mucosal lymphocytes, which are likely within normal limits). The entire bladder was sectioned at 3 mm increments and examined microscopically. The mass seen on ultrasound may have been a temporary occurence (e.g. an adjacent enlarged lymph node) that had resolved by the time of necropsy. Renal inflammation is chronic, non-specific and typical for a felid of this age. Inflammation at the gastro-esophageal junction is presumed to be due previous hiatal herniation. Spiral bacteria present in the stomach are most likely Helicobacter sp.; their significance is unknown as they are not associated with gastric inflammation or ulceration. Hepatic changes are similar to the most recent biopsy (B17-0010) and are of a mild severity that is often considered less clinically significant in many animals. A prior mild/temporary hepatic insult or induction of hepatic enzymes by endogenous or exogenous steroids are possible causes of the derrangements in hepatic clinical chemistry values. There was no indication of veno-occlusive disease, signficant hepatic fibrosis or cholestasis.

Andrew Cartoceti A. Cartoceti 6/19/2017

PROSECTOR	PATHOLOGIST	DATE COMPLETED

Pathology Module - Final Pathology Report
NATIONAL ZOOLOGICAL PARK

PATH # N2017-0080

Death Date: 5/10/2017
Necropsy Date: 5/10/2017

GALLUS GALLUS DOMESTIC
Domestic chicken (breed unspecified
Name: Brienne

Gender: Female
Age: 2Y 2M 9D
Chip: 985-112-004-506-005

Accession No.: 216360
Birth: 01 Mar 2015
Acquired: 25 Mar 2015
Removed: 10 May 2017

SEX: Female AGE: 2Y 2M 9D WEIGHT: 1.65 kg STAY:
MANNER OF DEATH:Euthanasia INTERVAL:0-6 hours
TIME OF DEATH: XRAYED:False
DEATH LOCATION: DISPOSITION:INCINERATE
SUBMITTOR: PROSECTOR:TFW
OWNER/ANIMAL DEPT:

HISTORY AND CLINCICAL OBSERVATIONS:

KEEPER OBSERVATIONS: On By

CLINICIAN OBSERVATIONS: On By

GROSS DESCRIPTION: On By

GROSS DIAGNOSIS: By

LABORATORY STUDIES:

TISSUE STATUS:

SHELVED:	False
TRIMMED:	False
FROZEN:	False
ULTRAFROZEN:	False

Tissues Ultrafrozen:

SPECIAL REQUESTS: On By

HISTOLOGY: On 9/25/2017 By KAH

1. CEREBRUM, OPTIC LOBES
2. LUNG, BEREBELLUM, BRAINSTEM, OBEX
3. KIDNEY, SPLEEN, LIVER
4. LIVER, KIDNEY
5. OVARY, INTESTINE
6. OLD FOLLICLE, INTESTINE
7. DUODENUM, PANCREAS, INTESTINE
8. DUODENUM, PANCREAS, ILEOCECAL
9. CECA, GALLBLADDER
10. BILE DUCT, ESOPHAGUS/PROVENTRICULUS
11. VENTRICULUS, PROVENTRICULUS, CROP
12. OVIDUCT
13. OVIDUCT
14. HEART, TRACHEA, EOPHAGUS, BONE MARROW
15. THYROID, PODODERMATITIS
16. EYES

MORPHOLOGIC DIAGNOSIS:

1) Ovary and oviduct: Ovarian carcinoma with yolk coelomitis, carcinomatosis, and metastasis to lung, intestine, kidney, pancreas, and large arteries
2) Lung: Pneumonia, granulomatous, mild, with intrahistiocytic pigment.
3) Toe skin: Pododermatitis, granulomatous, locally extensive, chronic.
4) Arteries: Atherosclerosis, mild.
5) Liver: Hepatitis, periportal, mixed, mild
6) Ureter: Ureteritis, heterophilic to lymphoplasmacytic, moderate.
7) Spleen: Lymphoid depletion, white pulp, moderate
8) Ventriculus: Ventriculitis, lymphocytic, moderate, with degeneration of the koilin layer
9) Intestine: Enterocolitis, lymphocytic, mild.
10) Proventriculus: Proventriculitis, lymphocytic, mild

REMARKS: On 9/25/2017 By KAH

Reproductive carcinomas are quite common in hens, and frequently result in carcinomatosis, as seen in

this case. The tumor's spread affected most of the organs in the caudal coelomic cavity as well as the caudal lung field and the interior of some vessels.

TFW	WALSH	9/25/2017
PROSECTOR	PATHOLOGIST	DATE COMPLETED

Pathology Module - Final Pathology Report
NATIONAL ZOOLOGICAL PARK

PATH # N2017-0083

Death Date: 5/14/2017
Necropsy Date: 5/15/2017

CACICUS CELA (no subsp)
Yellow-rumped cacique
Name:

Gender: Unknown Sex
Age: 0Y 0M 1D

Accession No.: 216591
Birth: 13 May 2017
Acquired:
Removed: 14 May 2017

SEX: Unknown Sex AGE: 0Y 0M 1D WEIGHT: 14 gm STAY:

MANNER OF DEATH:Found Dead
TIME OF DEATH:
DEATH LOCATION:
SUBMITTOR:
OWNER/ANIMAL DEPT:DOO

INTERVAL:24-48 Hours
XRAYED:False
DISPOSITION:IN FORMALIN
PROSECTOR:TFW

HISTORY AND CLINCICAL OBSERVATIONS:

KEEPER OBSERVATIONS: On By

CLINICIAN OBSERVATIONS: On By

GROSS DESCRIPTION: On By

GROSS DIAGNOSIS: By

LABORATORY STUDIES:

TISSUE STATUS:

SHELVED:	False
TRIMMED:	True
FROZEN:	False
ULTRAFROZEN:	True

Tissues Ultrafrozen: wing liver kidney intestines

SPECIAL REQUESTS: On By

HISTOLOGY: On 9/25/2017 By KAH

1. LIVER, LUNG, SPLEEN
2. HEART, PROVENTRICULUS/VENTRICULUS, VENTRICULUS/DUODENUM, LARYNX
3. CLOACA, YOLK SAC, SI
4. KIDNEY, LEG, CAUDAL HEAD
5. HEAD

MORPHOLOGIC DIAGNOSIS:

1) Liver and kidney: Extramedullary hematopoiesis (normal for life stage)

REMARKS: On 9/25/2017 By KAH

No histological abnormalities are noted. Cause of death is likely multifactorial and involves hypothermia, stress, trauma, and inadequate caloric intake, all of which are typical for fallen nestlings.

TFW	WALSH	9/25/2017
PROSECTOR	PATHOLOGIST	DATE COMPLETED

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Pathology Module - Final Pathology Report
NATIONAL ZOOLOGICAL PARK

PATH # N2017-0084

Death Date: 5/15/2017
Necropsy Date: 9/25/2017

NEMATOBRYCON PALMERI
Emperor tetra
Name:

Gender: Unknown Sex
Age:

Accession No.: 500875
Birth:
Acquired: 03 May 2016

SEX: Unknown Sex AGE: ADULT WEIGHT: 0 gm STAY:

MANNER OF DEATH:Euthanasia
TIME OF DEATH:
DEATH LOCATION:WHS
SUBMITTOR:JCS
OWNER/ANIMAL DEPT:DOA

INTERVAL:Not recorded
XRAYED:False
DISPOSITION:IN FORMALIN
PROSECTOR:WALSH

HISTORY AND CLINCICAL OBSERVATIONS:

KEEPER OBSERVATIONS: On By

CLINICIAN OBSERVATIONS: On 5/15/2017 By JCS

Curator reported significant ulcers noted along the dorsum and tail. Observations today showed excessive gilling, moderate coelomic distension, severe ulcers along the dorsum just caudal to the cranium and at the base of the tail that extend through the skin and into the muscle layer. Previous tank history of acid fast organisms in other necropsied emperor tetras. Due to quality of life concerns euthanasia was performed with buffered MS222.

GROSS DESCRIPTION: On By

GROSS DIAGNOSIS: By

LABORATORY STUDIES:

TISSUE STATUS:

SHELVED:	False
TRIMMED:	True
FROZEN:	False
ULTRAFROZEN:	False

Tissues Ultrafrozen:

SPECIAL REQUESTS: On By

HISTOLOGY: On 9/25/2017 By KAH

1.DECALCIFIED AND SECTIONED BODY

MORPHOLOGIC DIAGNOSIS:

1) Body as a whole: Multisystemic granulomas. Presumptive mycobacteriosis
2) Skin: Dermatitis, lymphohistiocytic, marked, with ulceration and underlying granulomatous myositis.

REMARKS: On 9/25/2017 By KAH

The cause of death in this animal is presumed to be mycobacteriosis due to the tank history and widespread granulomatosis. Skin lesions may be unusual manifestations of mycobacteriosis or a secondary infection in a compromised animal.

WALSH	WALSH	9/25/2017
PROSECTOR	PATHOLOGIST	DATE COMPLETED

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Pathology Module - Final Pathology Report
NATIONAL ZOOLOGICAL PARK

PATH # N2017-0086

Death Date: 5/18/2017
Necropsy Date: 5/18/2017

GALLIRALLUS OWSTONI
Guam rail
Name:

Gender: Unknown Sex
Age: 0Y 0M 0D

Accession No.: 216592
Birth: 18 May 2017
Acquired: 18 May 2017
Removed: 18 May 2017

On loan from AGANA AQUATIC AND WILDLIFE PRESERVE, DEPT OF AGRICULTURE

SEX: Unknown Sex AGE: 0Y 0M 0D WEIGHT: 17.5 gm STAY:

MANNER OF DEATH: Euthanasia
TIME OF DEATH: 12:00P
DEATH LOCATION: WHS
SUBMITTOR: E. Royer
OWNER/ANIMAL DEPT: DCM

INTERVAL: 0-6 hours
XRAYED: False
DISPOSITION: FORMALIN
PROSECTOR: Andrew Cartoceti

HISTORY AND CLINCICAL OBSERVATIONS:

KEEPER OBSERVATIONS: On 5/18/2017 By ER

-Artificially incubated
-Egg #55
-Dam: 216568
-Sire: 216241
-Date laid: 2 May 2017
-Expected hatch date: 22 May 2017

This egg was immediately pulled for artificial incubation as the dam and sire have no experience incubating and have a history of breaking eggs. This embryo was slated to be genetically sexed for hand-rearing as a program animal for Santa Fe Teaching Zoo, as per SSP recommendations. Upon candling it was discovered that the embryo exhibited abnormal movement and the vascular development appeared to be delayed compared to a typical Guam rail embryo. It is undetermined whether this is related to a developmental aberration or malposition, or some other cause. However, because of the abnormality this egg will not be incubated to term and will not be hatched. Euthanasia was requested based on the likelihood that the embryo would not survive to hatch and/or would have significant physical or health defects.

CLINICIAN OBSERVATIONS: On By

GROSS DESCRIPTION: On 5/19/2017 By ANC

A 17.5 gram Guam rail egg is necropsied on 18 May 2017 following euthanasia for abnormal in ovo movement. The egg is identified as "55" and is ~4.4 cm long by ~3.0 cm in widest diameter. The air cell is drawn down and the membranes are translucent. The embryo is in normal hatch position with the head under the right wing and the beak pointed towards the air cell. There are many obvious urate precipitates and the yolk sac is approximately equal size as the embryo (stage 42 to 44). The yolk sac, membranes, vasculature, external aspects of the embyro (eyes, beak, skin, appendages, vent) and liver are grossly unremarkable.

GROSS DIAGNOSIS: By ANC

No gross lesions identified, stage 42 to 44

LABORATORY STUDIES:

TISSUE STATUS:

SHELVED:	False
TRIMMED:	True
FROZEN:	False
ULTRAFROZEN:	True

Tissues Ultrafrozen: Wing, liver

SPECIAL REQUESTS: On By

HISTOLOGY: On 6/12/2017 By ANC

1. YOLK SAC: WNL.

2. HEAD, NASAL CAVITY, EYES, BRAIN, TRACHEA, ESOPHAGUS: WNL.

3. NECK, SPINAL CORD, TRACHEA, ESOPHAGUS, THYROID, THYMUS, LUNGS; CRANIAL BODY, HEART, LIVER: WNL.

4. WHOLE BODY, LUNG, PROVENTRICULUS, VENTRICULUS, LIVER, INTESTINES, KIDNEY, ADRENAL: WNL.

MORPHOLOGIC DIAGNOSIS:

1) Body as a whole: Late embryonic euthanasia, no significant histolologic lesions identified

REMARKS: On 6/12/2017 By ANC

6/12/17: Histology did not reveal any morphologic changes to suggest a cause for this chick's abnormal in ovo movement; the central and peripheral nervous systems and skeletal muscles appeared appropriate. There was no evidence of membrane accident, malpositioning, developmental anomalies or infectious diesease (aerobic cultures negative). Functional abnormalities that are not manifested as a morphological change (e.g. electrolyte imbalances) are still possible.

Andrew Cartoceti	Andrew Cartoceti	6/12/2017
PROSECTOR	PATHOLOGIST	DATE COMPLETED

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Pathology Module - Final Pathology Report
NATIONAL ZOOLOGICAL PARK

PATH # N2017-0087

Death Date: 5/19/2017
Necropsy Date: 5/19/2017

COPEINA GUTTATA
Redspotted tetra
Name:

Gender: Unknown Sex
Age:

Accession No.: 500876
Birth:
Acquired: 03 May 2016

SEX: Unknown Sex AGE: ADULT WEIGHT: 2.5 gm STAY:

MANNER OF DEATH: Euthanasia
TIME OF DEATH: 09:00A
DEATH LOCATION: WHS
SUBMITTOR: Kendra Bauer
OWNER/ANIMAL DEPT: DOA

INTERVAL: 0-6 hours
XRAYED: False
DISPOSITION: FORMALIN
PROSECTOR: Andrew Cartoceti

HISTORY AND CLINCICAL OBSERVATIONS:

KEEPER OBSERVATIONS: On By

CLINICIAN OBSERVATIONS: On 5/19/2017 By KB

This fish was noted to be swimming abnormally in the water column and was progressively worse despite treatment. Due to poor prognosis and history of Mycobacterium in the tank, euthanasia was elected. The fish was euthanized with buffered MS-222.

GROSS DESCRIPTION: On 5/19/2017 By ANC

A 2.5 gram, adult, unknown sex, redspotted tetra is necropsied on 19 May 2017 following euthanasia for swimming abnormally in the water column. The fish has a total length of 7.0 cm and a fork length of 6.3 cm and is in good postmortem condition and good body condition with well-fleshed muscles and obvious coelomic adipose. Skin scrapes and gill and fin clips are unremarkable. The gills are bright red. The swim bladder is inflated. The eyes, fins, tail, heart, liver, spleen, kidney, stomach and intestines are grossly unremarkable.

GROSS DIAGNOSIS: By ANC

No gross lesions identified
Good body condition

LABORATORY STUDIES:
CYTOLOGY: Gill and fin clip, skin scrape - WNL

TISSUE STATUS:

SHELVED:	False
TRIMMED:	True
FROZEN:	False
ULTRAFROZEN:	False

Tissues Ultrafrozen:

SPECIAL REQUESTS: On By

HISTOLOGY: On 6/12/2017 By ANC

1. WHOLE BODY, EYES, BRAIN, SPINAL CORD, ORAL CAVITY, PSEUDOBRANCH, THYROID, GILLS, LIVER, KIDNEY, PANCREAS, GASTROINTESTINAL TRACT, SWIM BLADDER; TESTES: There are small granulomas in the connective tissue surrounding skeletal muscle and adipose in the head and body and adjacent to the hepatopancreas. Few heterophils and macrophages infiltrate the tissue surrounding granulomas. Segmentally, macrophages and heterophils infiltrate the serosal layers of the swimbladder and occasionally form macrophage aggregates (immature granulomas).

2. WHOLE BODY, KIDNEY, TESTES; PEDUNCLE: The coelomic adipose is infiltrated by few heterophils and lymphocytes as well as two mature granulomas. There is active spermatogenesis.

MORPHOLOGIC DIAGNOSIS:

1) Body as a whole: Mycobacteriosis (presumptive)
2) Swim bladder, connective tissue, adipose: Moderate, multifocal, chronic, heterophilic and granulomatous pneumocystitis, cellulitis and steatitis

REMARKS: On 6/12/2017 By ANC

6/12/17: The presence of granulomas in multiple tissues is strongly suggestive of mycobacteriosis. Due

to the history of mycobacterium within this tank and the likelihood of this etiology based on consistent histologic lesions, acid-fast staining will not be performed for confirmation. Inflammation involving the swim bladder likely affected this animal's ability to regulate its buoyancy.

Andrew Cartoceti	Andrew Cartoceti	6/12/2017
PROSECTOR	PATHOLOGIST	DATE COMPLETED

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Pathology Module - Final Pathology Report
NATIONAL ZOOLOGICAL PARK

PATH # N2017-0088

Death Date: 5/19/2017
Necropsy Date: 5/19/2017

THAYERIA BOEHLKEI
Blackline penguin tetra
Name:

Gender: Unknown Sex
Age:

Accession No.: 500823
Birth:
Acquired: 11 Feb 2015
31 Dec 2016

SEX: Unknown Sex AGE: ADULT WEIGHT: 2.3 gm STAY:

MANNER OF DEATH: Euthanasia
TIME OF DEATH: 09:00A
DEATH LOCATION: WHS
SUBMITTOR: Kendra Bauer
OWNER/ANIMAL DEPT: DOA

INTERVAL: 0-6 hours
XRAYED: False
DISPOSITION: FORMALIN
PROSECTOR: Andrew Cartoceti

HISTORY AND CLINCICAL OBSERVATIONS:

KEEPER OBSERVATIONS: On By

CLINICIAN OBSERVATIONS: On 5/19/2017 By KB

This fish was noted to have a markedly distended coelom. Euthanasia was elected due to poor prognosis and history of Mycobacterium in the tank. The fish was euthanized with a bath of buffered MS-222.

GROSS DESCRIPTION: On 5/19/2017 By KAH

A 2.3 g adult penguin tetra is necropsied 19 May 2017 following euthanasia. The fish has a total length of 5.3 cm and a fork length of 4.9 cm. The carcass is in good postmortem condition and good body condition, but the abdomen is markedly distended. There is faint reddening at the axillary attachment of the pectoral fins. Upon reflection of the abdominal wall, the stomach is full and bulging, occupying greater than 50% of the coelomic cavity. Stomach contents are a foul-smelling brown paste, and the stomach wall is slightly thickened. A 2.5 cm long , <1 mm diameter, striated filamentous structure is pulled from the GI tract (suspected helminth).

The eyes, swim bladder, gills, heart, and skeletal muscle are grossly unremarkable.

GROSS DIAGNOSIS: By KAH

Stomach: Marked distension with intraluminal foul-smelling ingesta and suspected helminth

LABORATORY STUDIES:

OTHER: Stomach worm saved in 70% ethanol

TISSUE STATUS:

SHELVED:	False
TRIMMED:	True
FROZEN:	False
ULTRAFROZEN:	True

Tissues Ultrafrozen: Stomach contents

SPECIAL REQUESTS: On By

HISTOLOGY: On 6/13/2017 By ANC

1. WHOLE BODY, EYES, BRAIN, GILLS, HEART, LIVER, PANCREAS, KIDNEY, OVARY, GASTROINTESTINAL TRACT: Few eosinophilic granular cells are present in the leptomeninges. Multifocally, the endocardium and epicardium are expanded by mature granulomas centered on granular debris and circumscribed by a rim of fibrous connective tissue. Moderate numbers granulocytes, macrophage and lymphocytes infiltrate around granulomas. Similar granulomas are present in the connective tissue surrounding some visceral organs (kidneys, pancreas) and in the spleen and liver. In the stomach and small intestine, large numbers of eosinophilic granular cells and fewer macrophages and lymphocytes expand the lamina propria, surround blood vessels in the muscularis and form small aggregates in the serosal mesenteries. Focally, the tunica muscularis of the stomach is expanded by infiltrates of macrophages and multinucleated giant cells and fewer granulocytes and lymphocytes. The ovary is expanded by a densely cellular, thinly encapsulated mass composed of sheets of round to polygonal cells. Individual cells have indistinct borders, moderate to large amounts of granular cytoplasm and a round nucleus with finely stippled chromatin. Anisocytosis and anisokaryosis are mild; mitotic figures are rare. Two smaller proliferations of these cells are also present in the ovarian interstitium.

MORPHOLOGIC DIAGNOSIS:

1) Syndrome, mycobacteriosis (presumptive)
2) Heart, liver, spleen, connective tissue: Multiple chronic granulomas
3) Stomach: Moderate, focally extensive, chronic, granulomatous gastritis (suspect helminth migration tract) with intraluminal nematode

REMARKS: On 6/13/2017 By ANC

6/12/17: The histologic findings suggest that nematode infestation in the lumen and wall of the stomach is the cause of gastric distension. The stomach does not exhibit microbial overgrowth, as was seen in other fish from this accession. Widespread granulomas were also found in several organs that are highly suspicious for mycobacteriosis and likely contributed to debilitation. Due to the history of mycobacterium within this tank and the likelihood of this etiology based on consistent histologic lesions, acid-fast staining will not be performed for confirmation.

Andrew Cartoceti	Andrew Cartoceti	6/13/2017
PROSECTOR	PATHOLOGIST	DATE COMPLETED

Printed on: 6/13/2017 12:05:03 PM CARES-MED v2.119

Pathology Module - Final Pathology Report
NATIONAL ZOOLOGICAL PARK

PATH # N2017-0089

Death Date: 5/20/2017
Necropsy Date: 5/20/2017

NANGER DAMA RUFICOLLIS
Addra gazelle
Name: Obari

Gender: Male
Age: 3Y 3M 2D
Chip: 985 112 003 314

Accession No.: 115029
Birth: 18 Feb 2014
Acquired: 18 Feb 2014
Removed: 20 May 2017

On loan from WHITE OAK PLANTATION, YULEE

SEX: Male | AGE: 3Y 3M 2D | WEIGHT: 89.5 kg | STAY: > 30 Days

MANNER OF DEATH: Euthanasia
TIME OF DEATH: 11:30A
DEATH LOCATION: SCBI Ravinus Barn
SUBMITTOR: D. Reed/P. Joyner
OWNER/ANIMAL DEPT: DCM

INTERVAL: 0-6 hours
XRAYED: True
DISPOSITION: INCINERATE
PROSECTOR: Andrew Cartoceti

HISTORY AND CLINCICAL OBSERVATIONS:

KEEPER OBSERVATIONS: On 5/20/2017 By DR

The weather was cloudy and ambient temp was ~70 degrees.
This young adult male dama gazelle was housed by himself. He had outside access to a grass covered run.

He had past medical history of suspected rumanitis, trauma to his neck (fractured cervical vertebra), and swelling in his extremities.
He was a handleable male and all medical diagnostic and support treatments were performed under mild to moderate restraint.
During treatment for his most recent issue of swelling and lameness in left front leg he began to have some soft /loose stools followed by swelling in other extremities and left side of tail head. He also began having some allergic reactions at injection sites. At the beginning of treatment he initially ate well then began refusing pellet rations but continued to consume alfalfa hay well. His hay consumption began waining and he stopped eating apple fiber biscuits yesterday- his most sought after treat item. He neither showed interest in food, had not been observed ruminating in over a day and passed scant soft fecal material this morning.
wt: 123 lbs (5/18/17) his normal wt was closer to 118 lbs , suspected fluid build-up in the last few days.

CLINICIAN OBSERVATIONS: On 5/20/2017 By PJ

Adult male with history of rumenitis and vasculitis. Presented May 10th for swollen left forelimb. with lameness Treated for suspected abscess with oral nsaids and antibiotics.

Exam on 5/17/17 - developed soft dark stool positive on fecal occult blood. Left forelimb still swollen. Pale mucous membranes. left hip large soft tissue swelling, suspected to be reaction from previous injection site. Biopsy of left forelimb obtained 5/18/17 to rule out vasculitis, histo pending. Hematology revealed severe acute anemia (PCV 22%), Chemistry showed marked hypoproteinemia and acute kidney injury. Treated with omeprazole, probios, transfaunation, IVFT, and blood transfusion. Clinical chemistry continued to decline with dropping PCV, increasing BUN/Creat and primary metabolic alkalosis.

Exam 5/20/17 - scant fecal output, continues to be soft and dark; no evidence of urine output. Swollen right rear limb and left forelimb with pitting edema. Reluctant to ambulate. Hypothermic (T 99.1 F). PCV 9 %. Creat 15.7 mg/dl, BUN 250 mg/dl. Due to renal shut down and grave prognosis, euthanized with Euthasol 7 mls IV via jugular vein.

GROSS DESCRIPTION: On 5/23/2017 By ANC

A 58.5 kilogram, adult, intact male Addra gazelle is necropsied on 20 May 2017 following euthanasia. An orange tag in the left ear reads 0191 and a subcutaneous transponder reads 985112003314. The carcass is in good postmortem condition and fair body condition with well-fleshed muscles but scant amount of subcutaneous and intra-abdominal adipose.

Within the subcutis of the head, especially along the bridge of the nose, there is multifocal suffusive hemorrhage. There is a subtle swelling along the left dorsal aspect of the mid neck (previous articular facet fracture). There are subtle irregularities and differences in the margins of the cartilage on the articular facets of vertebrae C5 and C6, but no overt fibrosis/fracture callus or hemorrhage is appreciated in the facets or vertebral bodies adjacent to the intervertebral disks. Two small dermal incisions in the distal left forelimb (just proximal to the metacarpophalangeal joint and first interphalangeal joint) are closed with sutures (biopsy sites). All four limbs have mild to moderate soft swelling and pitting edema and there are multiple small excoriations in the skin. There is soft swelling along the caudal aspect of the left proximal hindlimb (overlying semimembranosus and semitendinosus) that corresponds to a large accumulation of gelatinous, dark red, clotted blood (hematoma). A rubbery, lamellated, pale tan-yellow thrombus fills the lumen of the femoral vein, along the entire length of the femur. The skin/subcutis over the right lateral thigh contains a 1 cm diameter, firm nodule. Multifocally, the subcutis, especially along the ventrum and the distal aspects of the limbs, is very wet and gelatinous, has suffusive red hemorrhage and oozes watery, red-tinged fluid on cut section.
Dark green-black, sticky feces stains the perineum.

The pleural cavity contains ~2 liters of red-tinged, watery fluid and strands of fibrin. The cranioventral aspects of the left cranial and caudal and right cranial and middle lung lobes are slightly collapsed, reddened and slightly rubbery. The distal trachea and mainstem bronchi contain small amounts of froth and feed material in their lumina. The pericardial sac contains excess watery, dark red fluid and moderate amounts of fibrillar to granular soft tan material (fibrin) are adhered to the epicardium. There are multiple petechial and ecchymotic hemorrhages in the epicardium and endocardium of all chambers.

Focally, the dorsal aspect of the right liver lobe is firmly adhered to the muscular diaphragm. Diffusely, the liver has an enhanced reticular pattern. Many pinpoint hemorrhages are present in the gallbladder wall. The cortex and medulla of both kidneys are diffusely slightly reddened and bulge slightly on cut section and the renal pelvices are slightly dilated. The adrenal cortices have multiple pinpoint hemorrhages. The rumen contains abundant, watery, green fluid and coarse feed material. The abomasum contains dark red watery fluid and few thin (<1 mm diameter by 2-3 cm long), twisted, nematode worms that occasionally have a spiral red stripe along their length. The abomasal folds are diffusely edematous and reddened with innumerable dark red petechiation. Many loops of jejunum are dilated, have a darkly reddened wall and are filled with abundant, watery, dark red fluid. The cecum and colon contain thick, sticky, dark green-black feces.

The brain, eyes, lymph nodes (retropharyngeal, mediastinal, sublumbar), esophagus, reticulum, omasum, pancreas, urinary bladder and testis are grossly unremarkable.

GROSS DIAGNOSIS: By ANC

Subcutis (head, limbs, ventrum): Severe, regionally extensive, edema and ecchymotic hemorrhage
Abomasum: Severe, diffuse, hemorrhagic abomasitis with few intraluminal twisted nematodes (suspect Haemonchus contortus)
Heart: Moderate, diffuse, acute, fibrinous pericarditis and moderate to severe, multifocal, acute epicardial and endocardial hemorrhage
Lungs: Moderate, regionally extensive, acute to subacute, cranioventral bronchopneumonia with abundant pleural effusion
Small intestine, jejunum: Moderate, multifocal to segmental, acute to subacute, mural hemorrhage and congestion (possible hemorrhagic enteritis)
Femoral vein, left: Severe, segmental, subacute to chronic thrombosis
Subcutis, left caudal thigh: Severe, subacute, subcutaneous hematoma
Adrenal glands, gall bladder: Mild to moderate, multifocal, petechial hemorrhage

LABORATORY STUDIES:

CULTURE:	Lung aerobic
CYTOLOGY:	Spleen impression smear
PARASITOLOGY:	Abomasal worms in 70% EtOH, suspect Haemonchus contortus
OTHER:	Testis to Repro, Skeletal muscle to SDZG

TISSUE STATUS:

SHELVED:	False
TRIMMED:	True
FROZEN:	False
ULTRAFROZEN:	True
Tissues Ultrafrozen:	Liver (2), kidney, lung, spleen, rumen content, small intestinal content, feces, urine, semimembranosus muscle

SPECIAL REQUESTS: On By

HISTOLOGY: On 6/23/2017 By ANC

1. LUNG: Throughout the sections, alveoli are variably collapsed and, along with terminal bronchioles, are flooded with variable amounts of proteinaceous fluid, fibrin, increased numbers of plump macrophages and fewer neutrophils and erythrocytes. Multifocally, alveolar capillaries are congested and adjacent alveolar lumina contain hemorrhage. Alveolar capillaries and medium caliber vessels multifocally have increased intraluminal neutrophils. Larger airways contain bacteria and plant debris. Multifocally, there is pleural and intralobular hemorrhage.
2. LUNG: In one region of the lung, the alveoli are flooded as previously described. Alveolar macrophages often have intracytoplasmic erythrocytes.
3. LIVER; GALLBLADDER: The outer layers of the gallbladder wall are expanded by edema. Multifocally, typically in periacinar locations, hepatic cords are necrotic or dissociated and surrounded by hemorrhage and neutrophils. Occasionally, neutrophils fill periacinar sinusoids without accompanying necrosis. There is scattered extramedullary hematopoiesis.
4. LIVER; SPLEEN; ADRENALS, THYROID: There is extramedullary hematopoiesis in the liver and spleen. The zona fasciculata of the adrenals has multifocal congestion and hemorrhage. There is marked variation in follicle size in the thyroid.
5. BONE MARROW; COLON; TESTIS; EPIDIDYMIS: The marrow is >95% adipocytes, many of which are effaced by granular eosinophilic to basophilic material (saponification). The colonic mucosa has abundant intraepithelial globular protein. The serosal adipose has microhemorrhage, increased macrophages and scattered adipocyte saponification. There is active spermatogenesis with mature spermatids in the epididymis.

6. FEMORAL VEIN: The lumen of the vein is occluded and expanded by a large thrombus composed of lamellations of necrotic erythrocytes and protein that is multifocally mineralized and infiltrated by macrophage and fibroblasts. These cells infiltrate the adjacent vessels wall along with fibrous connective tissue, hemorrhage and increased profiles of small blood vessels (vasa vasorum proliferation).
7. KIDNEY: There is widespread acute tubular necrosis and the interstitium surrounding affected tubules contain few neutrophils. Other tubules are dilated and filled with proteinaceous fluid.
8. KIDNEY; URINARY BLADDER: There is renal tubular necrosis as previously described.
9. HEART, RIGHT ATRIUM and VENTRICULUS, LEFT VENTRICULAR PAPILLARY MUSCLE: The myocardial and epicardial interstitium and epicardial adipose, predominantly in the right heart, have increased clear space (edema), hemorrhage and infiltrates of macrophages and fewer lymphocytes and neutrophils. Multifocally, there is endocardial hemorrhage.
10. HEART, INTERVENTRICULAR SEPTUM, LEFT VENTRICULAR FREE WALL: Cardiac lesions as previously described. Segmentally, the epicardium is overlain with a coagulum of protein.
11. RUMEN; RETICULUM: In both chambers, lamina proprial vessels are surrounded by lymphocytes and plasma cells that sometimes form dense nodular aggregates. Few neutrophils infiltrate the lamina propria and epithelium, where they occasionally form intraepithelial pustules. The mucosal epithelium is hyperplastic with branching rete pegs and the cornified layers are widely colonized by filamentous bacteria.
12. OMASUM; ABOMASUM: The omasum has similar changes as described in the other forestomachs, with the addition of scattered mucosal hemorrhage. In the abomasum, there is widespread infiltration of the lamina propria by lymphocytes, plasma cell and erythrocytes. The submucosa has increased clear space and macrophages. Scattered serosal adipocytes are saponified and surrounded or infiltrated by few macrophages and neutrophils.
13. DUODENUM; PANCREAS; JEJUNUM (NON-DILATED): Similar to the heart, pancreatic interlobular septa are expanded by edema, microhemorrhage, and few macrophages and neutrophils. Scattered serosal adipocytes are saponified and surrounded or infiltrated by few macrophages and neutrophils.
14. JEJUNUM (DILATED): There is diffuse advanced autolysis characterized by hypereosinophilia and loss of differential staining.
15. CECUM; SPIRAL COLON; DESCENDING COLON: The colonic mucosa has abundant intraepithelial globular protein. The serosal adipose has microhemorrhage, increased macrophages and scattered adipocyte saponification.
16. TRACHEA; ESOPHAGUS; DIAPHRAGM: WNL.
17. PITUITARY GLAND, SPINAL CORD (C5, C6): Scattered myelin sheath in white matter tracts are dilated.
18. SEMITENDINOSUS MUSCLE: WNL.
19. BRAIN, BRAINSTEM; RETROPHARYNGEAL LYMPH NODES: Lymph node sinuses contain increased clear space (edema), erythrocytes and macrophages with intracytoplasmic pigment (presumptive hemosiderosis) and erythrocytes (erythrophagocytosis).
20. BRAIN, CEREBRUM: WNL.
21. BRAIN, CEREBRUM, THALAMUS: The Virchow-Robbins space around some vessels in the white matter is expanded by wispy blue material (edema vs postmortem artifact).
22. BRAIN, CEREBRUM, THALAMUS, HIPPOCAMPUS: : Perivascular spaces are as described previously.
23. BRAIN, CEREBRUM: WNL.
24. BRAIN, MIDBRAIN: WNL.
25. BRAIN, BRAINSTEM, CEREBELLUM: WNL.
26. BRAIN, BRAINSTEM, CEREBELLUM: There are lamellar concretions of mineral within the choroid plexus.

MORPHOLOGIC DIAGNOSIS:

1) (A) Lungs: Severe, bilateral, cranioventral alveolar edema, fibrin exudation and histiocytosis with multifocal subacute alveolar hemorrhage and
1) (B) intra-bronchiolar plant material (presumptive early aspiration pneumonia)
2) Kidneys: Moderate to severe, diffuse, acute tubular necrosis
3) Femoral vein: Severe, chronic organizing thrombus with mineralization
4) Abomasum: Moderate, diffuse, chronic, lymphoplasmacytic abomasitis with mucosal hemorrhage and submucosal edema
5) Liver: Moderate, multifocal, acute, periacinar hepatocellular necrosis with hemorrhage and neutrophilic infiltration
6) Heart: Moderate, diffuse interstitial and epicardial edema and hemorrhage with macrophage and neutrophil infiltration and epicardial fibrin exudation
7) Adipose: Mild to moderate, multifocal individual adipocyte saponification with microhemorrhage and mild histiocytic and neutrophilic steatitis
8) Forestomachs: Moderate, diffuse, chronic-active rumenitis, reticulitis and omasitis with abundant superficial mucosal filamentous bacteria
9) Adrenal glands: Moderate, multifocal, acute cortical hemorrhage
10) Lymph nodes, retropharyngeal: Sinus erythrocytosis with hemosiderosis (presumptive) and erythrophagocytosis (drainage reaction)

REMARKS: On 6/23/2017 By ANC

6/23/17: Many of the histologic findings are consistent with severe Haemonchosis (abomasitis) or sequelae of the marked anemia and hypoproteinemia that Haemonchosis can cause (hypoxic liver and kidney necrosis, multiorgan edema and hemorrhage due to suspected coagulopathy). These lesions can also be caused by sepsis or shock, which may have been complicating this animal's condition in the terminal stages of disease. The findings within the lungs are suggestive of acute aspiration of stomach contents that has not had time to develop into overt pneumonia. Aerobic culture of the lungs yielded no growth, possibly due to recent antibiotic treatment. The initial presentation (single limb edema) as well as thrombosis of the left femoral vein are not typical for haemonchosis, and their exact cause remains uncertain. Thrombus formation is chronic, recurrent and has had some time to organize and fibrose. Speculatively, it could be due to coagulopathy, idiosyncratic drug reaction or local trauma from prior injections. Serology from blood banked in January was negative for Bluetongue and Epizootic Hemorrhagic

Disease viruses. The histology is also inconsistent with these viral etiologies, as well as Malignant Catarrhal Fever and Deer Adenovirus. PCR positivity for Babesia sp./Theileria sp. likely represents a subclinical infection as hemoparasites are not evident on blood and splenic smears and there is no evidence of intra or extravascular hemolysis. Inflammation in the forestomach (rumenitis, etc) is similar to that found in other animals from this collection and is reminiscent of the lesions of chronic chemical rumenitis/ruminal acidosis in domestic ruminants; however, this is not believed to be directly related to this animal's decline. Myocyte inclusions were not present, as previously described in other animals from this herd.

Andrew Cartoceti	Andrew Cartoceti	6/23/2017
PROSECTOR	PATHOLOGIST	DATE COMPLETED

Printed on: 6/23/2017 9:57:18 AM CARES-MED v2.119

Pathology Module - Final Pathology Report
NATIONAL ZOOLOGICAL PARK

PATH # N2017-0090

Death Date: 5/24/2017
Necropsy Date: 5/24/2017

DENDROBATES TINCTORIUS
Dyeing poison frog
Name:

Gender: Unknown Sex
Age:

Accession No.: 307069
Birth:
Acquired: 30 Jul 2004
01 Jul 2016

SEX: Unknown Sex AGE: ADULT WEIGHT: 4.9 gm STAY:
MANNER OF DEATH:Found Dead INTERVAL:6-24 hours
TIME OF DEATH: XRAYED:False
DEATH LOCATION:F-line, RDC DISPOSITION:INCINERATE
SUBMITTOR:KM PROSECTOR:Holder
OWNER/ANIMAL DEPT:DAH

HISTORY AND CLINCICAL OBSERVATIONS:

KEEPER OBSERVATIONS: On 5/24/2017 By KM

Found dead during AM exhibit check

CLINICIAN OBSERVATIONS: On By

GROSS DESCRIPTION: On 5/24/2017 By KAH

A 4.9 g, adult, undetermined sex (pending histology), blue poison dart frog is necropsied on 24 May 2017 after being found dead in its exhibit. The carcass is moderately autolyzed, and body condition is slightly thin with scant intra-coelomic adipose stores. No significant abnormalities are noted.

GROSS DIAGNOSIS: By KAH

Body as a whole: Reduced body condition with scant adipose. Moderate autolysis.

LABORATORY STUDIES:

TISSUE STATUS:

SHELVED:	False
TRIMMED:	True
FROZEN:	False
ULTRAFROZEN:	False

Tissues Ultrafrozen:

SPECIAL REQUESTS: On By

HISTOLOGY: On 6/27/2017 By KAH

1. HEAD
2. FEET FEMUR
3. LIVER KIDNEY INTESTINE HEART

MORPHOLOGIC DIAGNOSIS:

1) Body as a whole: Poor body condition.
2) Skin, foot: Mild, locally extensive, acute, granulocytic pododermatitis with intralesional hyphal organisms consistent with Saprolegnia.
3) Liver: Melanomacrophage hyperplasia, moderate. (Slide 3)
4) Liver: Reduced lipid storage. (Slide 3)

REMARKS: On 6/27/2017 By KAH

The hyphal organism involved in the pododermatitis (slide 2) is presumed to be Saprolegnia. Saprolegniasis may be a terminal change in animals debilitated for other reasons and is not necessarily the sole cause of poor health. Proliferation of Saprolegnia postmortem also occurs, but the inflammatory response in this case indicates antemortem infection. The lack of lipid storage in the liver and mesentery (slide 3) is consistent with usage of fat deposits and negative energy balance, and the melanomacrophage hyperplasia indicates a reactive immune status.

Holder	CARTOCETI	6/27/2017
PROSECTOR	PATHOLOGIST	DATE COMPLETED

Printed on: 6/27/2017 9:46:19 AM CARES-MED v2.119

Pathology Module - Final Pathology Report
NATIONAL ZOOLOGICAL PARK

PATH # N2017-0091

Death Date: 5/25/2017
Necropsy Date: 5/25/2017

HYPHESSOBRYCON PULCHRIPINNIS
Lemon tetra
Name:

Gender: Unknown Sex
Age:

Accession No.: 500778
Birth:
Acquired: 21 Jul 2004
16 May 2017

SEX: Unknown Sex AGE: ADULT WEIGHT: 2.1 gm STAY:
MANNER OF DEATH:Euthanasia INTERVAL:
TIME OF DEATH: XRAYED:False
DEATH LOCATION:WHS DISPOSITION:INCINERATE
SUBMITTOR:JCS PROSECTOR:Holder
OWNER/ANIMAL DEPT:DOA

HISTORY AND CLINCICAL OBSERVATIONS:

KEEPER OBSERVATIONS: On By

CLINICIAN OBSERVATIONS: On 5/25/2017 By JCS

Adult, geriatric lemon tetra found by keepers to have poor position in the water column, swimming horizontal with multiple frayed fins. Due to concerns for long term quality of life euthanasia was elected. Fish came from field station tank with other fish known to have acid fast granulomas present in their coelom.

GROSS DESCRIPTION: On 5/25/2017 By KAH

A 2.1 gram, adult, unknown sex, lemon tetra is necropsied on 25 May 2017 following euthanasia for swimming abnormally in the water column. The fish has a total length of 5.4 cm and a fork length of 4.3 cm and is in good postmortem condition and good body condition with well-fleshed muscles and an undetermined amount of coelomic adipose. Skin scrapes and gill and fin clips are unremarkable. The gills are bright red. The swim bladder is inflated. The eyes, fins, tail, heart, liver, spleen, kidney, stomach and intestines are grossly unremarkable.

GROSS DIAGNOSIS: By KAH

No gross lesions identified
Good body condition

LABORATORY STUDIES:
CYTOLOGY: Gill and fin clip, skin scrape - WNL

TISSUE STATUS:

SHELVED:	False
TRIMMED:	True
FROZEN:	False
ULTRAFROZEN:	False

Tissues Ultrafrozen:

SPECIAL REQUESTS: On By

HISTOLOGY: On 6/27/2017 By KAH

1. BRAIN HEAD KIDNEY ESOPHAGUS GILLS EYE STOMACH LIVER
2. LIVER INTESTINE TESTIS

MORPHOLOGIC DIAGNOSIS:

1) Body as a whole: Multisystemic granulomas in all tissues with intralesional organisms consistent with Mycobacterium spp.

REMARKS: On 6/27/2017 By KAH

This fish had microscopic granulomas of varying stages of maturity in all body systems, including the brain, and filamentous bacteria are detectable in a subset of granulomas. Given the tank history, these lesions are presumptively attributed to mycobacteriosis. Further diagnostics will not be pursued.

Holder	CARTOCETI	6/27/2017
PROSECTOR	PATHOLOGIST	DATE COMPLETED

Printed on: 6/27/2017 9:56:24 AM CARES-MED v2.119

Pathology Module - Final Pathology Report
NATIONAL ZOOLOGICAL PARK

PATH # N2017-0092

Death Date: 5/25/2017
Necropsy Date: 5/25/2017

GALLIRALLUS OWSTONI
Guam rail
Name:

Gender: Male
Age: 0Y 0M 1D

Accession No.: 216595
Birth: 24 May 2017
Acquired: 24 May 2017
Removed: 24 May 2017

On loan from AGANA AQUATIC AND WILDLIFE PRESERVE, DEPT OF AGRICULTURE

SEX: Male AGE: 0Y 0M 1D WEIGHT: 13.9 gm STAY:

MANNER OF DEATH:Euthanasia
TIME OF DEATH:
DEATH LOCATION:SCBI Vet Hosp
SUBMITTOR:PJ
OWNER/ANIMAL DEPT:DCM

INTERVAL:6-24 hours
XRAYED:False
DISPOSITION:INCINERATE
PROSECTOR:Holder

HISTORY AND CLINCICAL OBSERVATIONS:

KEEPER OBSERVATIONS: On By

CLINICIAN OBSERVATIONS: On 5/25/2017 By PJ

It was requested that this embryo be euthanized as there are no adults available to hatch and raise this bird. Related to embryo showing abnormal behavior in egg recently. Placed in anesthesia chamber with isoflurane gas for >2 hours. Shell was then broken and embryo decapitated immediately. Submitted in formalin. No histopathology is requested.

GROSS DESCRIPTION: On 5/25/2017 By KAH

Submission is the contents (embryo, fetal membranes, yolk sac) of a Guam rail egg; contents are in formalin. A 17.5 gram Guam rail egg is necropsied on 25 May 2017 following euthanasia for management reasons. There are many obvious urate precipitates, and the embryo is approximately 44 mm in length. The yolk sac, membranes, vasculature, external aspects of the embyro (eyes, beak, skin, appendages, vent) and liver are grossly unremarkable.

GROSS DIAGNOSIS: By KAH

No gross lesions identified, stage 37-39

LABORATORY STUDIES:

TISSUE STATUS:

SHELVED:	False
TRIMMED:	False
FROZEN:	False
ULTRAFROZEN:	False

Tissues Ultrafrozen:

SPECIAL REQUESTS: On By

HISTOLOGY: On 6/27/2017 By KAH

1. BRAIN EYES
2. HEART LUNGS SKIN ESOPHAGUS
3. LIVER PANCREAS INTESTINE KIDNEY ADRENAL VETRICULUS
4. BEAK LEG
5. YOLK SAC MEMBRANES

MORPHOLOGIC DIAGNOSIS:

1) Body as a whole: Normal fetal development.

REMARKS: On 6/27/2017 By KAH

There are no gross or histological abnormalities noted in this rail fetus.

Holder	CARTOCETI	6/27/2017
PROSECTOR	PATHOLOGIST	DATE COMPLETED

Printed on: 6/27/2017 10:04:30 AM CARES-MED v2.119

Pathology Module - Final Pathology Report
NATIONAL ZOOLOGICAL PARK

PATH # N2017-0093

Death Date: 5/26/2017
Necropsy Date: 5/26/2017

PAROARIA CORONATA
Red-crested cardinal
Name:

Gender: Male
Age: 10Y 2M 10D

Accession No.: 216284
Birth: 16 Mar 2007
Acquired: 19 Nov 2013
Removed: 26 May 2017

SEX: Male | AGE: 10Y 2M 10D | WEIGHT: 79.4 gm | STAY:

MANNER OF DEATH:Found Dead
TIME OF DEATH:
DEATH LOCATION:Pool 1
SUBMITTOR:LM
OWNER/ANIMAL DEPT:DOA

INTERVAL:6-24 hours
XRAYED:False
DISPOSITION:INCINERATE
PROSECTOR:Holder

HISTORY AND CLINCICAL OBSERVATIONS:

KEEPER OBSERVATIONS: On 5/26/2017 By LM

Found deceased in Pool 1. Area is mixed species. Bird had been observed in past days to holding left wing lower then the right. Bird had evaded capture attempts by flying away.

CLINICIAN OBSERVATIONS: On By

GROSS DESCRIPTION: On 5/26/2017 By KAH

A 79.5 g, adult, male red-crested cardinal is presented for necropsy on 26 May 2017 after being found dead in pool 1. The carcass is in poor postmortem condition and adequate body condition. On the left leg, there is a metal band inscribed with 30379. On the right leg, only digit 1 is intact, the remaining toes are apparently healed amputations, and the leg has a red band. The left humeral head is slightly roughened, and the surrounding musculature is mildly atrophic.

GROSS DIAGNOSIS: By KAH

Body as a whole: Severe autolysis, adequate body condition
Right leg: anterior digit amputations
Left humeral head: Mild arthritis
Left brachium: Muscular atrophy, mild

LABORATORY STUDIES:

TISSUE STATUS:

SHELVED:	False
TRIMMED:	True
FROZEN:	False
ULTRAFROZEN:	False

Tissues Ultrafrozen:

SPECIAL REQUESTS: On By

HISTOLOGY: On 6/27/2017 By KAH

1. HEART TRACHEA SKELETAL MUSCLE KIDNEY
2. PROVENTRICULUS VENTRICULUS LUNG
3. GI BURSA
4. KIDNEY BRAIN
5. HEAD

MORPHOLOGIC DIAGNOSIS:

1) Body as a whole: Severe autolysis.
2) Right leg: anterior digit amputations
3) Left wing: Muscular atrophy

REMARKS: On 6/27/2017 By KAH

The severe autolysis in this animal rendered the tissues nondiagnostic for most purposes. Abdominal fat stores were detectable histologically, and there was adequate musculature grossly, decreasing the likelihood that negative energy balance contributed to mortality.

Holder	CARTOCETI	6/27/2017
PROSECTOR	PATHOLOGIST	DATE COMPLETED

Pathology Module - Final Pathology Report
NATIONAL ZOOLOGICAL PARK

PATH # N2017-0094

Death Date: 5/26/2017
Necropsy Date: 5/26/2017

ATELOPUS ZETEKI
Panamanian golden frog
Name:

Gender: Female
Age: 11Y 10M 28

Accession No.: 307463
Birth: 28 Jun 2005
Acquired: 03 Jun 2013
Removed: 26 May 2017

On loan from BALTIMORE ZOO, BALTIMORE

SEX: Female | AGE: 11Y 10M 28 | WEIGHT: 7 gm | STAY: > 30 Days

MANNER OF DEATH:Euthanasia
TIME OF DEATH:
DEATH LOCATION:WHS
SUBMITTOR:KB
OWNER/ANIMAL DEPT:DOH

INTERVAL:0-6 hours
XRAYED:False
DISPOSITION:FORMALIN
PROSECTOR:KH

HISTORY AND CLINCICAL OBSERVATIONS:

KEEPER OBSERVATIONS: On By

CLINICIAN OBSERVATIONS: On 5/26/2017 By KB

This frog was reported today to have decreased use of limbs and had a mass on the ventral coelom. On visual, this animal was noted to be emaciated and had minimal movement noted. A round ~0.2 cm diameter mass was present on midline over the cranial ventral coelom. Euthanasia was elected due to poor prognosis associated with poor nutritional state and suspected tetany. For euthanasia, buffered MS-222 was administered intracoelomically. After euthanasia, the mass was no longer as apparent.

GROSS DESCRIPTION: On 5/26/2017 By KH

A 7.0 g, adult, female Panamanian golden frog is necropsied on 26 May 2017 after being euthanized for paresis. The carcass is in good postmortem condition, and body condition is slightly thin with scant intra-coelomic adipose stores. There are abundant eggs in the coelom. No significant abnormalities are noted.

GROSS DIAGNOSIS: By TFW

1. Body as a whole: Reduced body condition with scant adipose

LABORATORY STUDIES:

TISSUE STATUS:

SHELVED:	False
TRIMMED:	True
FROZEN:	False
ULTRAFROZEN:	False

Tissues Ultrafrozen:

SPECIAL REQUESTS: On By

HISTOLOGY: On 6/27/2017 By KAH

1. HEAD
2. FEET TIBIA
3. GI LIVER KIDNEY OVARY OVIDUCT HEART SPLEEN
4.DORSAL BODY WALL

MORPHOLOGIC DIAGNOSIS:

1) Head: Osteomyelitis and dermatitis, focal, granulocytic and histiocytic, moderate, with intralesional bacterial colonies. (Slide 1)
2) Skin, subcutis, skeletal muscle (Dorsum): Melanoma. (Slide 4)
3) GI: Gastroenteritis, lymphocytic, mild. (Slide 3)

REMARKS: On 6/27/2017 By KAH

The osteomyelitis in this case is likely clinically significant but may also be secondary to other causes of ill health. While it does affect the full thickness of the skull, the underlying meninges and brain are not inflamed. The melanoma on the dorsum is unusual, but it is of undetermined clinical significance. A cause for this frog's reported tetany was not conclusively identified, but given two potentially significant pathologies in the skin, aberrations in ions that are essential for normal function (i.e. Na, Ca, K) may have resulted from either or both conditions. Additional staining to determine Gram status of the bacterium involved in the osteomyelitis is pending, and an addendum to

this report will be attached when those results are available.

KH	CARTOCETI	6/27/2017
PROSECTOR	PATHOLOGIST	DATE COMPLETED

Printed on: 6/27/2017 10:23:37 AM CARES-MED v2.119

Pathology Module - Final Pathology Report
NATIONAL ZOOLOGICAL PARK

PATH # N2017-0095

Death Date: 5/26/2017
Necropsy Date: 5/26/2017

ATELOPUS ZETEKI
Panamanian golden frog
Name:

Gender: Female
Age: 11Y 10M 22

Accession No.: 307632
Birth: 04 Jul 2005
Acquired: 13 Sep 2016
Removed: 26 May 2017

On loan from BALTIMORE ZOO, BALTIMORE

SEX: Female AGE: 11Y 10M 22 WEIGHT: 7.9 gm STAY:

MANNER OF DEATH:Euthanasia
TIME OF DEATH:
DEATH LOCATION:WHS
SUBMITTOR:KB
OWNER/ANIMAL DEPT:DOH

INTERVAL:0-6 hours
XRAYED:False
DISPOSITION:INCINERATE
PROSECTOR:Holder

HISTORY AND CLINCICAL OBSERVATIONS:

KEEPER OBSERVATIONS: On By

CLINICIAN OBSERVATIONS: On 5/26/2017 By KB

This frog was reported to have decreased use of all limbs ~ 1 week ago and was started on treatment with supplemental calcium and magnesium due to suspected tetany. Today, the frog was reported to be not improving and was noted to be not able to move at all. Euthanasia was elected due to poor prognosis. For euthanasia, buffered MS-222 was administered intracoelomically.

GROSS DESCRIPTION: On 5/26/2017 By KAH

A 7.9 g, adult, female Panamanian golden frog is necropsied on 26 May 2017 after being euthanized for paresis and suspected tetany. The carcass is in good postmortem condition, and body condition is slightly thin with scant intra-coelomic adipose stores. The coelom contains a moderate amount of red-tinged fluid. There are abundant eggs in the coelom. No significant abnormalities are noted.

GROSS DIAGNOSIS: By KAH

Body as a whole: Reduced body condition with scant adipose.
Coelom: Coelomic effusion (possible euthanasia artifact)

LABORATORY STUDIES:

TISSUE STATUS:

SHELVED:	False
TRIMMED:	True
FROZEN:	False
ULTRAFROZEN:	False

Tissues Ultrafrozen:

SPECIAL REQUESTS: On By

HISTOLOGY: On 6/27/2017 By KAH

1. HEAD
2. GI LIVER KIDNEY OVARY
3. FEET FEMUR

MORPHOLOGIC DIAGNOSIS:

1) Intestines: Protozoal enteritis, mild, with intralesional flagellates. (Slide 2)
2) Kidneys: Tubulonephrosis, mild, with protein loss and tubular dilation. (Slide 2)

REMARKS: On 6/27/2017 By KAH

Kidney or enteric disease may have contributed to this animal's reported tetany via disruption of normal ion regulation. The identity of the flagellates associated with the enteritis is unknown, and an overgrowth of normally commensal organisms cannot be ruled out.

Holder	CARTOCETI	6/27/2017
PROSECTOR	PATHOLOGIST	DATE COMPLETED

Printed on: 6/27/2017 10:17:21 AM CARES-MED v2.119

Pathology Module - Final Pathology Report
NATIONAL ZOOLOGICAL PARK

PATH # N2017-0096

Death Date: 5/28/2017
Necropsy Date: 5/28/2017

PARACHEIRODON INNESI
Neon tetra
Name:

Sex

Gender: Unknown

Accession No.: 500866

Age:

Birth:

Acquired: 15 Sep 2015

31 Dec 2016

SEX: Unknown Sex AGE: ADULT WEIGHT: 0.9 gm STAY:

MANNER OF DEATH:Found Dead
TIME OF DEATH:
DEATH LOCATION:Pool 2
SUBMITTOR:DC
OWNER/ANIMAL DEPT:DOA

INTERVAL:0-6 hours
XRAYED:False
DISPOSITION:INCINERATE
PROSECTOR:Holder

HISTORY AND CLINCICAL OBSERVATIONS:

KEEPER OBSERVATIONS: On 5/28/2017 By DC

0.0.1 neon tetra - found deceased in Pool #2 on skimmer. All other fish in tank are normal BAR.

Specimen submitted to pathology.

CLINICIAN OBSERVATIONS: On By

GROSS DESCRIPTION: On 5/28/2017 By KAH

A 0.9 gram, adult, unknown sex, neon tetra is necropsied on 28 May 2017 after being found dead in pool 2. The fish has a total length of 3.6 cm and a fork length of 3.3 cm. The carcass is in poor postmortem condition and adequate body condition with well-fleshed muscles. Severe autolysis has made the flesh friable, and the internal organs are semi-liquid.

GROSS DIAGNOSIS: By KAH

No gross lesions identified

Severe autolysis

LABORATORY STUDIES:

TISSUE STATUS:

SHELVED:	False
TRIMMED:	True
FROZEN:	False
ULTRAFROZEN:	False

Tissues
Ultrafrozen:

SPECIAL REQUESTS: On By

HISTOLOGY: On 6/27/2017 By KAH

1. HEAD HEART HEAD KIDNEY BRAIN GILLS EYES

2. GI LIVER KIDNEY OVARY TAIL

MORPHOLOGIC DIAGNOSIS:

1) Heart: Myxomatous endocardial proliferation, severe. (Slide 1)

2) Heart: Myocarditis and pericarditis, severe, with steatitis in surrounding tissue. (Slide 1)

3) Head and body, skin: Oomycotic dermatitis, multifocal, moderate with intralesional hyphae. (Slide 1)

4) Liver: Reduced lipid stores. (Slide 2)

5) Eye: Corneal mineralization. (Slide 1)

REMARKS: On 7/7/2017 By KAH

The etiologies of the heart lesions are undetermined, but the heart lumen is markedly occluded, and the severity of the proliferative lesions likely led to the death of this animal. Myxomatous proliferation of undetermined pathogenesis has been noted in farmed salmon and as an aging change in zebrafish (Danio rerio). The proliferative lesion in this tetra is quite extensive, and neoplasia (cardiac myxoma) cannot be ruled out.

While some of the hyphal proliferation in the skin is potentially postmortem, the reactive changes indicate that several sites were infected antemortem. The hyphal organism is presumed to be Saprolegnia. This may have been a secondary issue in a fish experiencing declining health. Lack of lipid storage in the liver may indicate prolonged negative energy balance. This animal was female (ovaries, slide 2).

Holder	CARTOCETI	7/7/2017
PROSECTOR	PATHOLOGIST	DATE COMPLETED

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Pathology Module - Final Pathology Report
NATIONAL ZOOLOGICAL PARK

PATH # N2017-0097

Death Date: 6/1/2017
Necropsy Date: 6/1/2017

OCTODON DEGUS	Gender: Female	Accession No.: 114997
Degu	Age: 4Y 5M 0D	Birth: 01 Jan 2013
Name: Pepper Jackie	Chip: 985112000608253	Acquired: 23 Oct 2013
		Removed: 01 Jun 2017

SEX: Female	AGE: 4Y 5M 0D	WEIGHT: 213 gm	STAY: > 30 Days
MANNER OF DEATH:	Found Dead		INTERVAL: 0-6 hours
TIME OF DEATH:	10:00A		XRAYED: False
DEATH LOCATION:	SMH #11		DISPOSITION: INCINERATE
SUBMITTOR:	Kenton Kerns		PROSECTOR: Kali Holder
OWNER/ANIMAL DEPT:	DOM - SMH		

HISTORY AND CLINCICAL OBSERVATIONS:

KEEPER OBSERVATIONS: On 6/1/2017 By ANC

Adult female degu, lives with 2.4 other degus on exhibit. Found dead at 10am in exhibit nest box. Animal is bloated, weighed 215g. No significant weight changes over the past few months. Animal came to NZP as an adult without birthdate, so managed as possibly geriatric. Exhibit includes wooden perching and sand, nestbox filled with shredded newspaper.

CLINICIAN OBSERVATIONS: On By

GROSS DESCRIPTION: On 6/1/2017 By ANC

A 213 gram, adult, female degu is necropsied on 1 June 2017 after being found dead. The carcass is in poor postmortem condition with green discoloration of the skin and subcutis, friable viscera and severe gas distension of the intestinal tract. The carcass is in good body condition with moderately well-fleshed musculature and adequate subcutaneous and intra-abdominal adipose stores. Regionally, there is pale tan stippling in the capsular surface of the cranial aspect of the liver. The stomach contains green granular ingesta and the colon contains unformed feces. A right maxillary premolar is severely overgrown. The brain, eyes, trachea, esophagus, lungs, heart, spleen, kidneys and reproductive tract are grossly unremarkable.

GROSS DIAGNOSIS: By ANC

Teeth, right mandibular premolar: Malocclusion
Body as a whole: Good body condition, moderate to severe autolysis

LABORATORY STUDIES:

TISSUE STATUS:

SHELVED:	False
TRIMMED:	True
FROZEN:	False
ULTRAFROZEN:	True

Tissues Ultrafrozen: Liver

SPECIAL REQUESTS: On By

HISTOLOGY: On 6/26/2017 By ANC

1. LUNG; HEART; TRACHEA; ESOPHAGUS
2. BRAIN
3. LIVER; KIDNEY; SPLEEN; ADRENAL
4. STOMACH; SMALL INTESTINE; MESENTERIC LYMPH NODE
5. LARGE INTESTINE; OVARIES; UTERUS

MORPHOLOGIC DIAGNOSIS:

1) Body as a whole: Advanced autolysis
2) Body as a whole: Good body condition

REMARKS: On 6/26/2017 By ANC

6/26/17: A cause of death was not established as no significant gross or histologic lesions were identified; however, advanced autolysis may have obscured more subtle changes. Body condition was good with robust adipocytes, suggesting that this animal may have declined more acutely versus having more

chronic disease.

Kali Holder	Andrew Cartoceti	6/26/2017
PROSECTOR	PATHOLOGIST	DATE COMPLETED

Pathology Module - Final Pathology Report
NATIONAL ZOOLOGICAL PARK

PATH # N2017-0098

Death Date: 6/2/2017
Necropsy Date: 6/2/2017

OCTODON DEGUS	Gender: Female	Accession No.: 114996
Degu	Age: 4Y 5M 1D	Birth: 01 Jan 2013
Name: Asiaga	Chip: 985112000608096	Acquired: 23 Oct 2013
		Removed: 02 Jun 2017

SEX: Female	AGE: 4Y 5M 1D	WEIGHT: 164 gm	STAY: > 30 Days
MANNER OF DEATH: Euthanasia			INTERVAL: 0-6 hours
TIME OF DEATH: 10:15A			XRAYED: False
DEATH LOCATION: WHS			DISPOSITION: INCINERATE
SUBMITTOR: KLH			PROSECTOR: Kali Holder
OWNER/ANIMAL DEPT: DOM - SMH			

HISTORY AND CLINCICAL OBSERVATIONS:

KEEPER OBSERVATIONS: On By

CLINICIAN OBSERVATIONS: On 6/2/2017 By KLH

Geriatric animal with history of ruptured globe OS, spondylosis, and recent significant weight loss (164g on 5/17, down from 220g a year ago). Exam today revealed a large firm heterogenous (on ultrasound) mass in cranioventral abdomen.

Discussed findings with curator and elected euthanasia based on mass, age, and current condition. Euthasol 0.3ml intracardiac administered.

GROSS DESCRIPTION: On 6/2/2017 By ANC

A 164 gram, adult, female degu (985112000608096) is necropsied on 2 June 2017 after being euthanized. The carcass is in good postmortem condition and poor to fair body condition with well-fleshed musculature but scant subcutaneous and intra-abdominal adipose stores. Focally in the mid-jejunum, the lumen is dilated forming a 1.5 cm in diameter mass filled with pasty green material. The wall of the dilated jejunum is 2-3 mm thick, is pale tan tan to white and exudes small amounts of purulent white material. Several loops of adjacent small intestine and mesentery are firmly adhered to the exterior of the mass. The stomach contains abundant granular yellow to white to green, fluidy ingesta and the colon has formed fecal pellets. Both adrenal glands are enlarged. The capsular surface of both kidneys has multiple, shallow, irregular, stellate depressions (chronic infarcts). The caudal pole of the left kidney is expanded by a 0.4 cm diameter cyst filled with clear fluid. The left eye is slightly sunken within the orbit compared to the right. The brain, trachea, esophagus, heart, lungs, spleen, liver, urinary bladder, reproductive tract and remainder of the digestive tract are grossly unremarkable.

GROSS DIAGNOSIS: By ANC

Jejunum: Segmental dilation with circumferential mural thickening and serosal adhesions
Kidneys: Multiple chronic infarcts and focal cortical cyst
Body as a whole: Poor to fair body condition with scant adipose

LABORATORY STUDIES:

TISSUE STATUS:

SHELVED:	False
TRIMMED:	True
FROZEN:	False
ULTRAFROZEN:	True

Tissues Ultrafrozen: liver, jejunal mass

SPECIAL REQUESTS: On By

HISTOLOGY: On 7/14/2017 By ANC

1. LUNG; HEART
2. LIVER; SPLEEN
3. KIDNEY; ADRENAL GLAND; MESENTERIC LYMPH NODE
4. BRAIN
5. STOMACH
6. SMALL INTESTINE; PANCREAS; LARGE INTESTINE
7. JEJUNAL MASS; BROWN & HOPPS: Large numbers of Gram-negative rods and fewer Gram-positive rods and cocci are present within the necrotic mucosa.
8. OVARIES; UTERUS; URINARY BLADDER; TRACHEA; ESOPHAGUS; LARYNX; THYROID

9. EYE, LEFT

SPECIAL STAINS:
5. Warthin-Starry (modified and spirochetes); Brown and Hopps: No significant bacteria present.

MORPHOLOGIC DIAGNOSIS:

1) Small intestine, jejunum: Severe, segmental, chronic, transmural, necrosuppurative enteritis with abundant mixed bacteria and fibroplasia
2) Stomach: Moderate, multifocal to segmental, chronic, neutrophilic and necrotizing gastritis with glandular hyperplasia
3) Eye, left: Moderate, chronic keratitis with stromal fibrosis, Descemet's membrane rupture and anterior synechiae
4) Eye, left: Cortical cataract with fiber dissolution and mineralization
5) Heart: Mild, multifocal, chronic, lymphoplasmacytic myocarditis with focally extensive myocyte loss and replacement fibrosis
6) Bile ducts: Mild to moderate, multifocal, lymphoplasmacytic, intra and extrahepatic cholangitis
7) Kidneys: Mild, multifocal, chronic, lymphocytic interstitial nephritis with fibrosis and cystic tubular dilation (chronic infarcts)
8) Spleen: Mild, focal, granulomatous splenitis (possible organizing thrombus)
9) Adrenal gland: Focal organizing fibrin thrombus
10) Adrenal glands: Mild, multifocal adrenalitis
11) Liver: Hepatocellular anisocytosis, anisokaryosis and binucleation
12) Aorta: Mild to moderate, focal, tunica media mineralization
13) Lung: Mild, multifocal, chronic, lymphocytic bronchiolitis
14) Adipose: Adipocyte atrophy

REMARKS: On 7/14/2017 By ANC

8/17/17: Special stains of the gastric lesions did not reveal significant bacteria (including Helicobacter sp.) and, as such, a viral or stress-related etiology is possible.

7/14/17: The mass within the small intestine consists of a segment of full thickness necrosis and suppurative inflammation that is developing into an abscess. Intestinal abscessation can be the common endpoint of a number of different inciting diseases that result in compromise of the intestinal wall, including infectious enteritis (bacterial, viral, protozoal), vascular accident (i.e. thrombosis, hemorrhage) or functional/mechanical stasis (i.e. obstruction, perforation, intussusception). At this stage of disease, an underlying cause was not able to be established, but there was no evidence of neoplasia or a foreign body within the affected intestine. Gastritis is significant and appears to be bacterial in origin, but infectious agents were not identified. Special stains of the stomach are pending and pertinent results will be communicated in an addendum. Ocular lesions are consistent with prior rupture of the left eye, as described clinically. The remaining diagnoses are considered mild and/or less clinically significant.

Kali Holder	Andrew Cartoceti	7/14/2017
PROSECTOR	PATHOLOGIST	DATE COMPLETED

Pathology Module - Final Pathology Report
NATIONAL ZOOLOGICAL PARK

PATH # N2017-0100

Death Date: 6/4/2017
Necropsy Date: 6/5/2017

RATTUS NORVEGICUS (no subsp)
Norway rat
Name: Petunia

Gender: Female

Age: 3Y 11M 7D

Accession No.: 114988

Birth:
28 Jun 2013

Acquired: 21 Oct 2013

Removed:
04 Jun 2017

SEX: Female	AGE: 3Y 11M 7D	WEIGHT: 418 gm	STAY:
MANNER OF DEATH:	Euthanasia	INTERVAL:	6-24 hours
TIME OF DEATH:		XRAYED:	True
DEATH LOCATION:		DISPOSITION:	INCINERATE
SUBMITTOR:		PROSECTOR:	Holder
OWNER/ANIMAL DEPT:	DOM - SMH		

HISTORY AND CLINCICAL OBSERVATIONS:

KEEPER OBSERVATIONS: On By

CLINICIAN OBSERVATIONS: On 6/4/2017 By KB

This spayed female animal was reported today to have a decreased appetite and abnormal behavior (sleeping in abnormal areas/positions). On visual, the animal was hunched over in the enclosure with an increased respiratory rate. This animal was being treated with antibiotics for a recent history of green vaginal discharge, and an abdominal mass cranial to the R kidney was noted at the animal's last exam one week ago. Based on concern for quality of life in this geriatric animal, euthanasia was elected. The animal was euthanized with intracardiac euthasol and KCl.

Chronic medical findings include: chronic incisor malocclusion (treated with biweekly trims), OD medial canthus eyelid mass, cataracts OU, and a gradual decline in mobility, especially in hind legs.

GROSS DESCRIPTION: On 6/5/2017 By KAH

Presented for necropsy on Jun 6, 2017 is a 418 g, adult, ovariectomized female rat. Postmortem condition is good. Body condition score is good with abundant intra-abdominal fat, moderate subcutaneous fat, and adequate muscling. No transponder chip is detected. The incisors are maloccluded. There is a 2 mm diameter dark mass at the medial canthus of the right eye. The inguinal and axillary subcutaneous fat contains numerous 1-3 mm fluctuant round masses which contain opaque milky white fluid. The liver is mottled and soft. The ovaries are not present, but there are bilateral hemoclips identified in the mesovarial fat. The pituitary is markedly enlarged and dark red-black, 3-4 mm in diameter. There is hemorrhage in the pericardium and reddening of all lung fields (presumed euthanasia artifact). Histopathology is pending.

GROSS DIAGNOSIS: By KAH

Pituitary gland: Pituitary adenoma

Medial canthus, right eye: Tumor - differentials include meibomian adenoma, melanocytoma, melanoma

Subcutaneous fat, inguinal and axillary: Masses (Ddx: liquefied fat, adenomas, abnormal mammary tissue)

Heart: Hemopericardium (presumed euthanasia artifact)

Lung: Pulmonary congestion (presumed euthanasia artifact)

Body as a whole: Overconditioned

LABORATORY STUDIES:

TISSUE STATUS:

SHELVED:	False
TRIMMED:	True
FROZEN:	False
ULTRAFROZEN:	True
Tissues Ultrafrozen:	Liver, fat masses

SPECIAL REQUESTS: On By

HISTOLOGY: On 7/11/2017 By KAH

1. HEART, TONGUE, LUNG

2. KIDNEY, SPLEEN, LIVER, ADRENAL

3. STOMACH, EYE, MAMMARY, LYMPH NODE (MESENTERIC)

4. VAGINA, COLON, TONGUE

5. BRAIN, PITUITARY

MORPHOLOGIC DIAGNOSIS:

1) Pituitary gland: Pituitary adenoma of the pars distalis with giant cells. (Slide 5)

2) Mammary gland: Paraneoplastic galactorrhea. (Slide 3)

3) Kidney: Chronic progressive nephrosis.

4) Lung: Pulmonary edema, marked, with heart failure cells. (Slide 1)

5) Lung: Peribronchial lymphoid hyperplasia, multifocal, moderate. (Slide 1)

6) Heart: Myocardial degeneration, fibromyxomatous, locally extensive, marked. (Slide 1)

7) Urethra: Urethritis, suppurative and lymphoplasmacytic, moderate to severe. (Slide 4)

8) Perivaginal skin: Dermatitis, lymphoplasmacytic and parakeratotic, moderate, with intrafollicular mites. (Slide 4)

9) Vagina: Vaginitis, lymphocytic, mild, with mixed bacteria in mucocellular exudate of vestibule. (Slide 4)

10) Spleen: Splenic lymphoid hyperplasia, mild. (Slide 2)

11) Liver: Hepatic congestion, moderate. (Slide 2)

REMARKS: On 7/11/2017 By KAH

Lethargy and weakness are most likely attributable to a trio of age-related findings: progressive kidney disease, myocardial degeneration, and a large pituitary adenoma. Pituitary adenomas are frequent findings in geriatric Norway rats and have been reported to induce galactorrhea, as seen in this case, as well as paresis, depression, and visual impairment. Pulmonary edema with heart failure cells (macrophages with phagocytosed hemosiderin) and hepatic congestion indicate clinically significant cardiac insufficiency.

The history of green discharge in the vaginal region is likely related to the urethritis and mucoid vaginal discharge. It is possible that discomfort from the demodecosis led to regional overgrooming, predisposing to vaginitis and urethritis; likewise, the reverse is also possible. Regardless of the initiating factor, irritation and overgrooming may well have become a self-perpetuating cycle.

Holder	CARTOCETI	7/11/2017
PROSECTOR	PATHOLOGIST	DATE COMPLETED

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Pathology Module - Final Pathology Report
NATIONAL ZOOLOGICAL PARK

PATH # N2017-0101

Death Date: 6/7/2017
Necropsy Date: 6/7/2017

EUBLEPHARIS MACULARIUS
Leopard gecko
Name:

Gender: Female

Age: 0Y 5M 6D

Accession No.: 307661

Birth:
01 Jan 2017

Acquired: 25 May 2017

Removed:
07 Jun 2017

SEX: Female	AGE: 0Y 5M 6D	WEIGHT: 64.3 gm	STAY:
MANNER OF DEATH:	Euthanasia	INTERVAL:	0-6 hours
TIME OF DEATH:		XRAYED:	True
DEATH LOCATION:	WHS	DISPOSITION:	INCINERATE
SUBMITTOR:	KB	PROSECTOR:	Holder
OWNER/ANIMAL DEPT:	DAH		

HISTORY AND CLINCICAL OBSERVATIONS:

KEEPER OBSERVATIONS: On By

CLINICIAN OBSERVATIONS: On 6/7/2017 By KB

This animal had organisms suspicious for cryptosporidium noted on direct smear and there were acid fast organisms suspicious for cryptosporidium noted on fecal cytology of the conspecific. Due to concerns to the collection of lizards at RDC and lack of effective treatment for this parasite euthanasia was elected due to quality of life and collection concerns. This animal was euthanized with euthasol and KCl via intracardiac injection.

GROSS DESCRIPTION: On 6/7/2017 By KAH

Presented for necropsy on June 7, 2017 is a 64.3 g female leopard gecko in good postmortem condition and good body condition. Muscles are well developed, the tail and abdominal fat stores have abundant adipose tissue. There is a 4x3x2 mm white, firm mass attached to liver; a similar 3x2x1 mm mass is noted on the right lung.

GROSS DIAGNOSIS: By KAH

Coelom: Coelomic masses, undetermined.

LABORATORY STUDIES:

TISSUE STATUS:

SHELVED:	False
TRIMMED:	True
FROZEN:	False
ULTRAFROZEN:	False

Tissues
Ultrafrozen:

SPECIAL REQUESTS: On By

HISTOLOGY: On 7/11/2017 By KAH

Slides:

1. HEART, KIDNEY, COLON, LUNG SMALL INTESTINE, UTERUS

2. LIVER, COLON, MASSES

3. EYE, SKELETAL MUSCLE, BRAIN

MORPHOLOGIC DIAGNOSIS:

1) Liver: Hepatic lipidosis, moderate to marked, with subcapsular fibrosis. (Slide 2)

2) Vessel: Atherosclerosis, severe. (Slide 2)

3) Intestine: Enteritis, lymphocytic, mild, with intraluminal protozoa. (Slide 2)

4) Kidneys: Glomerular fat emboli. (Slide 1)

5) Serosa, multiorgan: Xanthomas (Slide 1 and 2)

6) Kidney: Renal gout, minimal. (Slide 1)

7) Body as a whole: Overconditioned.

REMARKS: On 7/11/2017 By KAH

The majority of the pathology in this case is related to long term caloric abundance and related fatty deposition. While there are apparent protozoa in some sections of GI, the morphology is inconsistent with Cryptosporidia, and the organisms are of undetermined pathogenicity. Molecular diagnostics are recommended to identity these organisms. The lack of apparent Cryptosporidia in histological section does not rule out the presence of Crypto, as histopathology is an insensitive diagnostic for these organisms.

Holder	Holder	7/11/2017
PROSECTOR	PATHOLOGIST	DATE COMPLETED

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Pathology Module - Final Pathology Report
NATIONAL ZOOLOGICAL PARK

PATH # N2017-0102

Death Date: 6/7/2017
Necropsy Date: 6/7/2017

EUBLEPHARIS MACULARIUS
Leopard gecko
Name:

Gender: Female

Age: 0Y 5M 6D

Accession No.: 307662

Birth:
01 Jan 2017

Acquired: 25 May 2017

Removed:
07 Jun 2017

SEX: Female	AGE: 0Y 5M 6D	WEIGHT: 65.1 gm	STAY:
MANNER OF DEATH:	Euthanasia	INTERVAL:	0-6 hours
TIME OF DEATH:		XRAYED:	True
DEATH LOCATION:	WHS	DISPOSITION:	INCINERATE
SUBMITTOR:	KB	PROSECTOR:	Holder
OWNER/ANIMAL DEPT:	DAH		

HISTORY AND CLINCICAL OBSERVATIONS:

KEEPER OBSERVATIONS: On By

CLINICIAN OBSERVATIONS: On 6/7/2017 By KB

This animal had acid fast organisms suspicious for cryptosporidium noted on fecal cytology. Due to concerns to the collection of lizards at RDC and lack of effective treatment for this parasite euthanasia was elected due to quality of life and collection concerns. This animal was euthanized with euthasol and KCl via intracardiac injection.

GROSS DESCRIPTION: On 6/7/2017 By KAH

Presented for necropsy on June 7, 2017 is a 65.1 g female leopard gecko in good postmortem condition and adequate body condition. Muscles are well developed, the tail and abdominal fat stores have adequate

adipose tissue. The tail is slightly blunted. The left lung has several 1-2 mm white foci. The surface of both kidneys is grainy and speckled with white. The distal colon contains abundant watery material.

GROSS DIAGNOSIS: By KAH

Lung: Suspect pulmonary granulomas.

Kidney: Nephrosis.

LABORATORY STUDIES:

TISSUE STATUS:

SHELVED:	False
TRIMMED:	False
FROZEN:	False
ULTRAFROZEN:	False

Tissues
Ultrafrozen:

SPECIAL REQUESTS: On By

HISTOLOGY: On 7/11/2017 By KAH

Slides:

STOMACH, BRAIN, HEART, KIDNEY, SPLEEN, PANCREAS, SMALL INTESTINE

LIVER, INTESTINE, LUNG, TONGUE

BRAIN, SKELETAL MUSCLE, SKIN, EYE

MORPHOLOGIC DIAGNOSIS:

1) Liver: Hepatic lipidosis, moderate to marked. (Slide 2)

2) Intestine: Enteritis, lymphocytic, mild, with intraluminal protozoa. (Slide 2)

3) Kidneys: Glomerular fat emboli. (Slide 1)

4) Vessels: Intimal mineralization. (Slides1 and 2)

5) Serosa, multiorgan: Lipid and yolk granulomas.

6) Body as a whole: Overconditioned.

REMARKS: On 7/11/2017 By KAH

Similar to case N17-0101, this animal has several fat-related lesions and intestinal protozoa of unknown significance.

Holder	Holder	7/11/2017
PROSECTOR	PATHOLOGIST	DATE COMPLETED

Printed on: 8/7/2017 4:26:03 PM CARES-MED v2.119

Pathology Module - Final Pathology Report
NATIONAL ZOOLOGICAL PARK

PATH # N2017-0103

Death Date: 5/30/2017
Necropsy Date: 5/30/2017

LANIUS LUDOVICIANUS MIGRANS
Loggerhead shrike
Name:

Gender: Unknown Sex
Age: 0Y 0M 4D

Accession No.: 216602
Birth: 26 May 2017
Acquired: 26 May 2017
Removed: 30 May 2017

SEX: Unknown Sex AGE: 0Y 0M 4D WEIGHT: 0 gm STAY: <= 30 Days

MANNER OF DEATH: Found Dead
TIME OF DEATH: 10:00A
DEATH LOCATION: SCBI SAF S-D
SUBMITTOR: Chris Crowe
OWNER/ANIMAL DEPT: DCO

INTERVAL:
XRAYED: False
DISPOSITION: FORMALIN
PROSECTOR: none

HISTORY AND CLINCICAL OBSERVATIONS:

KEEPER OBSERVATIONS: On 5/30/2017 By CC

-Housed outdoors with 1.1 adults and 0.0.4 juvenile same age conspecific siblings.
-Weather mild (hight of low 70's).
-No known health problems.
-Found dead in nest with live 0.0.4 siblings.
-Estimated to have hatched on 5/26/17 and to be 4 days on old when found dead.
-No obvious trauma, body warm. Pea-sized mass present in abdomen. Notably smaller sized than siblings.

CLINICIAN OBSERVATIONS: On By

GROSS DESCRIPTION: On 6/12/2017 By ANC

A whole Loggerhead shrike nestling is received whole fixed in formalin. The chick has no feathers and closed eyelids.

GROSS DIAGNOSIS: By ANC

No significant external lesions identified

LABORATORY STUDIES:

TISSUE STATUS:

SHELVED:	False
TRIMMED:	True
FROZEN:	False
ULTRAFROZEN:	False

Tissues Ultrafrozen:

SPECIAL REQUESTS: On By

HISTOLOGY: On 7/6/2017 By ANC

1. HEAD, EYES, BRAIN; NECK, SPINAL CORD, THYMUS
2. BODY, SPINAL CORD, LUNGS, HEART, LIVER, KIDNEY, SPLEEN, TRACHEA, ESOPHAGUS, PROVENTRICULUS, VENTRICULUS
3. BODY, KIDNEY, VENTRICULUS, SMALL INTESTINE, PANCREAS, LARGE INTESTINE, BURSA OF FABRICIUS, YOLK SAC

MORPHOLOGIC DIAGNOSIS:

1) Skin, hindlimb, body wall: Mild, multifocal, subacute, heterophilic dermatitis with crusting, abundant superficial coccoid bacteria and ulceration
2) Body as a whole: Fair body condition with small adipose stores

REMARKS: On 7/6/2017 By ANC

7/6/17: A cause for this nestling's death was not established. Although the internal adipose stores are modest, adipocytes are replete with lipid and the upper digestive tract contained insect parts, suggesting adequate nutrition. Dermatitis is likely less clinically significant, but is often due to urate/fecal scalding in nestlings. There is no evidence of other infectious/inflammatory, metabolic/toxic, traumatic, neoplastic or degenerative diseases, including squamous metaplasia of glands of the head which has been seen in other juveniles from this collection.

none CARTOCETI 7/6/2017

PROSECTOR	PATHOLOGIST	DATE COMPLETED

Pathology Module - Final Pathology Report
NATIONAL ZOOLOGICAL PARK

PATH # N2017-0104

Death Date: 6/13/2017
Necropsy Date: 6/13/2017

RUCERVUS ELDII THAMIN
Burmese brow-antlered deer
Name: CARMEN

Gender: Female
Age: 16Y 7M 20D

Accession No.: 113603
Birth: 24 Oct 2000
Acquired:
Removed: 13 Jun 2017

SEX: Female AGE: 16Y 7M 20D WEIGHT: 79.5 kg STAY: > 30 Days

MANNER OF DEATH:Euthanasia
TIME OF DEATH:10:00
DEATH LOCATION:AH01-03/Ravinus Barn
SUBMITTOR:Kelly Helmick
OWNER/ANIMAL DEPT:DCM

INTERVAL:0-6 hours
XRAYED:False
DISPOSITION:INCINERATE
PROSECTOR:Andrew Cartoceti

HISTORY AND CLINCICAL OBSERVATIONS:

KEEPER OBSERVATIONS: On 6/13/2017 By DR

This geriatric female Eld's Deer was receiving 1/4 tab of Firocoxib for age related mobility issues for an extended period of time UFN.
She had recently been housed with a young hand raised male Eld's deer whom she was a surrogate mother for. She did not nurse
him but did groom and stimulate him to urinate and defecate as needed. Several months ago a second juvenile male was added to
the pair to help keep the new juvenile tractable. She began to show estrus behavior continually the last few weeks while with them
and was subsequently separated from them ~2 weeks ago. During the last month her udder began to enlarge and retain fluid which
did not recede and was still evident today.
Carmen was most recently housed with another geriatric female 13863 (Noel). They tended to avoid each other with Carmen being
the dominant individual in the group.
6.12.17 Keeper D Reed found Carmen lying out in her holding yard in the sun in the extremely humid afternoon heat (92 degrees).
She was reluctant but eventually got up and followed keeper into the barn where she drank large amounts of water.
She weighed 77 kg (-2 kg since 29May17) and appeared uncomfortable and quite tucked up in her abdomen.
She had not been eating her medicated treat items well for the other keeper staff the last couple of days. but was willing to take them
reluctantly yesterday.
weight this am was: 78 kg

CLINICIAN OBSERVATIONS: On 6/13/2017 By KH

Geriatric female with chronic osteoarthritis, managed with long term NSAIDS and glucosamine.
Exam on 6/13/17 showed decreased body condition, patchy hair loss, diminished mobility, decreased rumen size and weight loss. Doe had mammary enlargement. FNA performed and confirmed milk production.

Due to deteriorating quality of life, euthanasia elected. Left jugular venipuncture for edta/serum/royal blue. Sedated with Xylazine IM. Administered Euthasol 8 mls IV. Confirmed cardiorespiratory arrest.

Confirmed left ear tattoo 3603. Confirmed left ear orange button tag 0194. No transponder.

GROSS DESCRIPTION: On 6/13/2017 By ANC

A geriatric, female, Eld's deer is necropsied on 13 June 2017 following euthanasia. The carcass is in good postmortem condition and good body condition with well-fleshed muscles and adequate subcutaneous and intra-abdominal adipose stores. A left ear tattoo reads "3603" and and orange ear tag reads "0194." A microchip is not detected. All four mammary gland quarters have regions that are more firm admixed with regions of soft cystic dilation. Both regions of mammary tissue ooze abundant milk on cut section. All appendicular joints examined have varying degrees of articular cartilage thinning and fibrillation, joint capsule thickening and increased joint fluid. Additionally, the glenohumeral and coxofemoral joints bilaterally have severe central cartilage loss. The humero-radial/ulnar and tarsal joints bilaterally have mild periarticular new bone formation (osteophytosis). The carpal joints bilaterally have markedly thickened joint capsules. The femorotibial joints bilaterally have severe thickening and hardening of the joint capsule, severe periarticular osteophytosis with loose osteophytes in the right stifle (joint mice), and synovial membrane hyperplasia. Throughout the lung parenchyma, there are few small, hard nodules (osseous metaplasia). The abdominal cavity contains 1-2 liters of frank, unclotted blood. There is a 4.5 cm long laceration in the right dorsocaudal portion of the liver, adjacent to the right kidney, to which a large blood clot is loosely adhered. The hepatic parenchyma surrounding the fracture is soft, dark-red and friable. In the left liver lobe, there is a 3 cm diameter mass that subtly bulges from the caudal surface. On cut section the mass is soft, pale tan and has a central cavitation. Dozens of pedunculated cysts, up to 3 cm in diameter and containing clear, yellow, watery fluid project from the serosa and mesentery of the oviducts and uterus. Both ovaries are expanded by many similar but non-pedunculated cysts. The rumen contains abundant, coarse, green roughage and the colon contains formed feces. The duodenal mucosa is multifocally reddened. There is moderate even wearing of the teeth and feed material impacted into deep gingival pockets between the 5th and 6th

right maxillary and mandibular cheek teeth. The brain, eyes, trachea, esophagus, heart, kidneys, spleen and gastrointestinal tract are grossly unremarkable.

GROSS DIAGNOSIS: By ANC

Femorotibial joints: Severe, chronic degenerative joint disease with joint capsule mineralization, osteophytosis and synovial membrane hyperplasia
Coxofemoral, glenohumeral and carpal joints: Moderate to severe, chronic degenerative joint disease with central cartilage eburnation
Humeroradial/ulnar and tarsal joints: Mild to moderate chronic degenerative joint disease with mild periarticular osteophytosis
Liver, left lobe: Acute rupture with hemoabdomen
Liver, right lobe: Focal cavitated mass
Uterus, oviduct: Multiple, pedunculated, serosal and mesenteric cysts (possible serosal inclusions cysts)
Ovaries: Multiple cysts (possible epithelial inclusion cysts)
Mammary glands: Multiple cystic lactiferous ducts with milk retention

LABORATORY STUDIES:

TISSUE STATUS:

SHELVED:	False
TRIMMED:	True
FROZEN:	False
ULTRAFROZEN:	True

Tissues Ultrafrozen: Liver (2)

SPECIAL REQUESTS: On 6/13/2017 By DR

Ovaries to Repro

HISTOLOGY: On 7/12/2017 By ANC

1. LUNG
2. LIVER
3. LIVER
5. KIDNEY
6. SPLEEN; THYROID
7. ADRENAL; TRACHEOBRONCHIAL LYMPH NODE; MAMMARY GLAND
8. HEART, LEFT PAPILLARY MUSCLE, INTERVENTRICULAR SEPTUM
9. HEART, RIGHT VENTRICULAR FREE WALL
10. TONGUE; SCIATIC NERVE; URINARY BLADDER
11. RUMEN; RETICULUM; OMASUM
12. ABOMASUM; DUODENUM
13. ESOPHAGUS; DUODENUM; JEJUNUM
14. LARGE INTESTINE
15. TRACHEA; PANCREAS; LYMPH NODE
16. OVARIES
17. UTERUS; VAGINA
18. OBEX; RETROPHARYNGEAL LYMPH NODES
19. BRAIN, CEREBRUM
20. BRAIN, THALAMUS
21. BRAIN, CEREBRUM, THALAMUS
22. BRAIN, CEREBRUM
23. BRAIN, CEREBELLUM
24. BRAIN, CEREBELLUM, BRAINSTEM
25. BRAIN
26. PITUITARY GLAND; TRIGEMINAL GANGLIA

MORPHOLOGIC DIAGNOSIS:

1) Liver: Multiple hepatocellular adenomas with vacuolar hepatopathy (glycogen type), telangiectasia, hemorrhage and sinusoidal fibrosis
2) Lung: Moderate, locally extensive, chronic-active, eosinophilic bronchitis
3) Trachea: Mild, diffuse, eosinophilic tracheitis
4) Adrenal gland: Pheochromocytoma
5) Thyroid gland: Nodular parafollicular cell (C cell) hyperplasia
7) Uterus: Multiple epithelial inclusion cysts
8) Ovary: Multiple, bilateral, cystic corpora lutea and epithelial inclusion cysts
9) Mammary gland: Mild, multifocal, chronic-active mastitis with gland and duct ectasia and focal squamous metaplasia

REMARKS: On 7/12/2017 By ANC

7/12/17: Liver masses are consistent with hepatocellular adenomas (hepatomas), in which there is accumulation of glycogen in hepatocytes and chronic and ongoing hemorrhage. Fragility of the hepatic masses is suspected to be the cause of the liver rupture and hemoabdomen, which likely resulted in the acute decline of this deer. Tracheobronchitis is most likely due to localized parasite infestation (i.e. lungworms) although worms or ova were not evident in section. Neuroendocrine hyperplasia/neoplasia in the thyroid and adrenal glands is reminiscent of that seen in aged domestic bulls. Ovarian cysts were a combination of mature follicles, cystic corpora lutea and epithelial inclusion cysts, while uterine cysts were epithelial inclusion cysts. Mammary glands were congested with proteinaceous secretions (milk) and contained little inflammation and no evidence of bacterial infection.

Andrew Cartoceti	Andrew Cartoceti	7/12/2017
PROSECTOR	PATHOLOGIST	DATE COMPLETED

Pathology Module - Final Pathology Report
NATIONAL ZOOLOGICAL PARK

PATH # N2017-0105

Death Date: 6/14/2017
Necropsy Date: 6/14/2017

MUSTELA NIGRIPES
Black-footed ferret
Name:

Gender: Unknown Sex
Age: 0Y 0M 7D

Accession No.: 115518
Birth: 07 Jun 2017
Acquired: 07 Jun 2017
Removed: 14 Jun 2017

SEX: Unknown Sex AGE: 0Y 0M 7D WEIGHT: 0 gm STAY: <= 30 Days

MANNER OF DEATH: Found Dead
TIME OF DEATH: 09:00A
DEATH LOCATION: SCBI F-15
SUBMITTOR: Priscilla Joyner
OWNER/ANIMAL DEPT: DCM

INTERVAL: 0-6 hours
XRAYED: False
DISPOSITION: FORMALIN
PROSECTOR: PJ

HISTORY AND CLINCICAL OBSERVATIONS:

KEEPER OBSERVATIONS: On 6/14/2017 By VL

Housed indoors in an environmentally controlled area with Dam. Dam had no abnormal diet changes but does have significant facial swelling present and has had a history of facial swelling in the past.

Dam 115429 (8739) whelped on 07 June 2017. At the first box check on 11 June 2017 four kits were found. All appeared normal and were all around the same size. On 12 June 2017 the Dam was noted to have some facial swelling. On 11 June 2017 the facial swelling on the Dam had increased and one of the kits appeared smaller than the others. The dam was examined and treated with antibiotics. All kits were examined as well. The normal sized kits (115515-115517) appeared to have some bloating of the abdomen but otherwise looked good, one of these kits weighed in at 22 grams for reference. This kit (115518), the smaller kit, weighed 15 grams, was less active than the other kits and had a wet anal region (clear looking fluid). Kit 115518 was given Simethicone and Amoxicillin orally. On the morning of 14 June 2017 kit 115518 was found moribund, right laterally recumbent and was only moving its mouth in a suckling manor. It had what appeared to be fresh milk on its muzzle (cream colored, wet substance), had dried feces with some frank blood on its anal region and base of tail. Additionally it urinated during examination. The urine was a pale milky yellow. Approximately 30 minutes later the kit was found deceased. It was right laterally recumbent.

CLINICIAN OBSERVATIONS: On By

GROSS DESCRIPTION: On 7/7/2017 By ANC

Formalin-fixed tissues are received.

GROSS DIAGNOSIS: By

LABORATORY STUDIES:

TISSUE STATUS:

SHELVED:	True
TRIMMED:	False
FROZEN:	False
ULTRAFROZEN:	False

Tissues Ultrafrozen:

SPECIAL REQUESTS: On By

HISTOLOGY: On 7/7/2017 By ANC

1. HEART; THYMUS; LUNG; TRACHEA; ESOPHAGUS; SPLEEN; KIDNEY
2. LIVER; GALLBLADDER; STOMACH; SMALL INTESTINE; LARGE INTESTINE; PANCREAS; SPLEEN; TESTIS; URINARY BLADDER
3. HEAD, EYES, BRAIN, NASAL CAVITY
4. HEAD, BRAIN

MORPHOLOGIC DIAGNOSIS:

1) Meninges: Severe, diffuse, subacute, fibrinous and neutrophilic meningitis with abundant intralesional bacilli
2) Nasal cavity: Severe, acute, diffuse, necrotizing rhinitis with intraluminal bacilli
3) Small intestine: Moderate, multifocal to segmental, acute, necrotizing enteritis with intraluminal hemorrhage

4) Dermal apocrine/eccrine glands, ventral abdomen: Moderate, regionally extensive, subacute, suppurative adenitis
5) Artery, umbilical: Mild, focal, subacute, neutrophilic arteritis
6) Adipose: Mild, multifocal atrophy
6) Lung: Mild, focal, subacute, neutrophilic pneumonia with alveolar histiocytosis

REMARKS: On 7/7/2017 By ANC

7/7/17: Meningeal, nasal and intestinal lesions are consistent with systemic infection with necrotoxigenic E. coli (NTEC) carrying the cytotoxic necrotizing factor 1 (cnf-1), which has been previously confirmed in another litter of ferrets that succumbed to similar disease (115474 through 115479). Similar infections have been reported in the literature in black-footed ferrets at other institutions in which contaminated feed was suspected to be the source of bacteria. Ferret isolates of E. coli share some virulence factors with human strains, and care should be taken when handling animals/items that may be infected/contaminated with E. coli. Mild pneumonia is most likely due to aspiration of small amounts of milk when nursing or inhalation of necrotic debris from the nasal cavity.

PJ	Andrew Cartoceti	7/7/2017
PROSECTOR	PATHOLOGIST	DATE COMPLETED

Printed on: 7/7/2017 4:27:44 PM CARES-MED v2.119

Pathology Module - Final Pathology Report
NATIONAL ZOOLOGICAL PARK

PATH # N2017-0106

Death Date: 6/15/2017
Necropsy Date: 6/15/2017

METYNNIS MACULATUS
Redbellied silver dollar
Name:

Gender: Unknown Sex
Age:

Accession No.: 500821
Birth:
Acquired: 11 Feb 2015
31 Dec 2016

SEX: Unknown Sex AGE: ADULT WEIGHT: 0 gm STAY:

MANNER OF DEATH: Found Dead
TIME OF DEATH: 11:00A
DEATH LOCATION: Pool 4
SUBMITTOR: Ed Smith
OWNER/ANIMAL DEPT: DOA

INTERVAL: 0-6 hours
XRAYED: False
DISPOSITION: FORMALIN
PROSECTOR: Andrew Cartoceti

HISTORY AND CLINCICAL OBSERVATIONS:

KEEPER OBSERVATIONS: On 6/15/2017 By ES

None.

CLINICIAN OBSERVATIONS: On By

GROSS DESCRIPTION: On 6/15/2017 By ANC

An adult, undetermined sex, spotted silver dollar is necropsied on 15 June 2017 following being found dead. The carcass is in poor postmortem condition with the right eye missing, a putrid odor and the coelomic viscera partially liquefied. Adipose stores cannot be determined. The fish has a total length of 13.4 cm and fork length of 12.6 cm. The fins are multifocally tattered. The gills are dull pale tan and friable. Within the coelomic cavity, there are dozens of pinpoint white nodules expanding the serosal surfaces of most organs and the coelomic lining (suspect granulomas). Individual organs cannot be identified.

Cytology of suspected granulomas revealed few acid-fast small bacilli (presumptive mycobacterium sp.) and large numbers of variably sized non-acid-fast rods (postmortem overgrowth).

GROSS DIAGNOSIS: By ANC

Widespread granulomas with acid-fast bacilli, presumptive mycobacteriosis

LABORATORY STUDIES:

CYTOLOGY: Coelomic granules, acid-fast

TISSUE STATUS:

SHELVED:	False
TRIMMED:	True
FROZEN:	False
ULTRAFROZEN:	False

Tissues Ultrafrozen:

SPECIAL REQUESTS: On By

HISTOLOGY: On By

MORPHOLOGIC DIAGNOSIS:

REMARKS: On 6/15/2017 By ANC

6/15/17: The gross findings are strongly suggestive of death due to disseminated mycobacteriosis. Due to the known presence of Mycobaterium in this tank and the condition of the tissue (autolyzed), histology will not be performed. This will serve as a final report.

Andrew Cartoceti	Andrew Cartoceti	6/15/2017
PROSECTOR	PATHOLOGIST	DATE COMPLETED

Printed on: 6/16/2017 9:49:25 AM CARES-MED v2.119

Pathology Module - Final Pathology Report
NATIONAL ZOOLOGICAL PARK

PATH # N2017-0107

Death Date: 6/15/2017
Necropsy Date: 6/15/2017

LORICARIA (unk sp)
Catfish
Name:

Gender: Unknown Sex
Age:

Accession No.: 500857
Birth:
Acquired: 26 Jun 2015
31 Dec 2016

SEX: Unknown Sex AGE: ADULT WEIGHT: 24.9 gm STAY:

MANNER OF DEATH: Found Dead
TIME OF DEATH:
DEATH LOCATION: H8
SUBMITTOR: Craig Saffoe
OWNER/ANIMAL DEPT: DOA

INTERVAL: 0-6 hours
XRAYED: False
DISPOSITION: FORMALIN
PROSECTOR: Andrew Cartoceti

HISTORY AND CLINCICAL OBSERVATIONS:

KEEPER OBSERVATIONS: On 6/15/2017 By CS

0.0.1 Loricaria simillima found dead in tank.

CLINICIAN OBSERVATIONS: On By

GROSS DESCRIPTION: On 6/15/2017 By ANC

A 24.9 gram, adult, undetermined sex, marbled whiptail catfish is necropsied on 15 June 2017 following being found dead. The carcass is in poor postmortem condition with a putrid odor, sloughing of some scales and partial liquefaction of coelomic viscera. Body condition cannot be assessed due to autolysis. The carcass has a total length of 19.5 cm and a fork length of 15 cm. Individual organs cannot be identified.

GROSS DIAGNOSIS: By ANC

Marked autolysis, no gross lesions identified

LABORATORY STUDIES:

TISSUE STATUS:

SHELVED:	False
TRIMMED:	True
FROZEN:	False
ULTRAFROZEN:	False

Tissues Ultrafrozen:

SPECIAL REQUESTS: On By

HISTOLOGY: On 7/13/2017 By ANC

1. HEAD, EYES, BRAIN, GILLS
2. HEAD, BRAIN; BODY, LIVER, POSTERIOR KIDNEY, SPINAL CORD
3. BODY, LIVER, POSTERIOR KIDNEY, OVARY, SPINAL CORD

MORPHOLOGIC DIAGNOSIS:

1) Brain, meninges: Severe, regionally extensive meningoencephalitis

REMARKS: On 7/13/2017 By ANC

7/13/17: Histology revealed severe inflammation in the brain and meninges that is suggestive of a bacterial infection as the cause of this fish's death. Due to the postmortem overgrowth of bacteria in the carcass, further identification of an etiologic agent is not possible. This fish is identified as a female.

Andrew Cartoceti	Andrew Cartoceti	7/13/2017
PROSECTOR	PATHOLOGIST	DATE COMPLETED

Printed on: 7/13/2017 11:25:37 AM CARES-MED v2.119

Pathology Module - Final Pathology Report
NATIONAL ZOOLOGICAL PARK

PATH # N2017-0108

Death Date: 6/15/2017
Necropsy Date: 6/15/2017

LANIUS LUDOVICIANUS MIGRANS
Loggerhead shrike
Name:

Gender: Male
Age: 0Y 0M 12D

Accession No.: 216621
Birth: 03 Jun 2017
Acquired: 03 Jun 2017
Removed: 15 Jun 2017

SEX: Male | AGE: 0Y 0M 12D | WEIGHT: 25.4 kg | STAY: <= 30 Days

MANNER OF DEATH: Found Dead
TIME OF DEATH: 07:30A
DEATH LOCATION: SCBI, FR-01
SUBMITTOR: Lynch
OWNER/ANIMAL DEPT: DCO

INTERVAL: 0-6 hours
XRAYED: False
DISPOSITION: FORMALIN
PROSECTOR: Andrew Cartoceti

HISTORY AND CLINCICAL OBSERVATIONS:

KEEPER OBSERVATIONS: On 6/15/2017 By L

Housed outdoors with 1.1.5 conspecifics.
Weather: warm (70's), and cloudy
No known aggression or health problems.

Bird was found lying on the groun a few feet from the nest. Carcass was cold to the touch and rigor had set in. No insects present. This bird along with its 5 nest mates had prematurely fledged sometime between 6/14 PM and 6/15 AM. This bird was also noted to be less mature than its siblings (siblings are fully feathered on their bodies). All 5 surviving siblings are BAR.

CLINICIAN OBSERVATIONS: On By

GROSS DESCRIPTION: On 6/15/2017 By ANC

A 25.4 gram, male, Loggerhead shrike nestling is necropsied on 15 June 2017 following being found dead. The carcass is in good postmortem condition and good body condition with adequate amounts of subcutaneous and intra-coelomic adipose. The feathers are just beginning to unsheath. A small amount of blood is crusted around the beak and nares. Bilaterally, the muscles over the ventral shoulder, clavicle and coracoid is regionally reddened. The ventriculus contains granular, orange-brown fibrous material and small amounts of grit. The intestine and colon contain small amounts of pasty green material. The lungs, heart, liver, spleen, kidneys and brain are grossly unremarkable.

GROSS DIAGNOSIS: By ANC

Beak, nares: Mild blood staining
Skeletal muscle, shoulders: Moderate, bilateral regionally extensive congestion/hemorrhage

LABORATORY STUDIES:

TISSUE STATUS:

SHELVED:	False
TRIMMED:	True
FROZEN:	False
ULTRAFROZEN:	False

Tissues Ultrafrozen:

SPECIAL REQUESTS On By

HISTOLOGY: On 7/11/2017 By ANC

1. HEART; LUNG; BRONCHI; ESOPHAGUS; LIVER; SPLEEN; KIDNEY; TESTES
2. TRACHEA; ESOPHAGUS; THYMUS; PROVENTRICULUS; VENTRICULUS; DUODENUM; PANCREAS; JEJUNUM; ILEUM; COLON; CLOACA; BURSA OF FABRICIUS
3. BRAIN
4. SKELETAL MUSCLE, SHOULDER; HEAD, EYES, NASAL CAVITY

MORPHOLOGIC DIAGNOSIS:

1) Nasal turbinates: Mild, multifocal, acute, heterophilic rhinitis with intralesional bacteria
2) Conjunctiva, palpebral: Mild, bilateral, subacute, heterophilic conjunctivitis
3) Skeletal muscle, shoulder: Moderate, regionally extensive, intramuscular congestion

REMARKS: On 7/11/2017 By ANC

7/11/17: Complications of early fledge/fall from the nest (exposure, trauma) remain as the most important factors in this shrike's death. Bacterial rhinitis and conjunctivitis are considered less clinically significant; both are mild and often associated with suboptimal nest hygiene.

Andrew Cartoceti	Andrew Cartoceti	7/11/2017
PROSECTOR	PATHOLOGIST	DATE COMPLETED

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Pathology Module - Final Pathology Report
NATIONAL ZOOLOGICAL PARK

PATH # N2017-0109

Death Date: 6/16/2017
Necropsy Date: 6/16/2017

ATELOPUS ZETEKI
Panamanian golden frog
Name:

Gender: Female
Age: 16Y 5M 15D

Accession No.: 307119
Birth: 01 Jan 2001
Acquired: 16 Dec 2004
Removed: 16 Jun 2017

On loan from BALTIMORE ZOO, BALTIMORE

SEX: Female | AGE: 16Y 5M 15D | WEIGHT: 6.7 gm | STAY: > 30 Days

MANNER OF DEATH: Euthanasia
TIME OF DEATH: 09:30A
DEATH LOCATION: WHS
SUBMITTOR: Kendra Bauer
OWNER/ANIMAL DEPT:

INTERVAL: 0-6 hours
XRAYED: False
DISPOSITION: FORMALIN
PROSECTOR: Andrew Cartoceti

HISTORY AND CLINCICAL OBSERVATIONS:

KEEPER OBSERVATIONS: On By

CLINICIAN OBSERVATIONS: On 6/16/2017 By KB

This 16+ year old (unknown exact age) has a chronic history of tetany that was being treated with topical calcium and magnesium. Due to poor response to treatment, weight loss, and poor consumption, euthanasia was elected. This animal was euthanized with intracoelomic buffered MS-222.

GROSS DESCRIPTION: On 6/16/2017 By ANC

A 6.7 gram, adult, female Panamanian golden frog is necropsied on 16 June 2017 following euthanasia for tetany. The carcass is in good postmortem condition and fair to poor body condition with exaggerated bony prominences over the pelvis and spine and inapparent fat bodies. In the mesentery of the duodenum and closely associated with the gallbladder, there is a 4 mm long by 2 mm diameter, multinodular, white to pale brown mottled mass. There are many vitellogenic follicles in both ovaries and a 4 mm diameter clear cyst in the right ovary. The stomach contains brown fibrous material (presumptive insect parts). The lungs, heart, liver, kidneys and intestinal tract are grossly unremarkable.

GROSS DIAGNOSIS: By ANC

Intestinal mesentery: Focal mass
Ovary, right: Focal cyst
Body as a whole: Fair to poor body condition with minimal adipose

LABORATORY STUDIES:

TISSUE STATUS:

SHELVED:	False
TRIMMED:	True
FROZEN:	False
ULTRAFROZEN:	True

Tissues Ultrafrozen: Liver, foot.

SPECIAL REQUESTS: On By

HISTOLOGY: On 7/11/2017 By ANC

1. HEART; LUNG; LIVER; GALLBLADDER; PANCREAS; SPLEEN
2. STOMACH; INTESTINE; OVARY; OVIDUCT; KIDNEY
3. HEAD, EYES, BRAIN; FEET

MORPHOLOGIC DIAGNOSIS:

1) Pancreas: Ductular epithelial mass (ductular hyperplasia versus adenoma versus adenocarcinoma)
2) Liver: Mild, multifocal hepatocellular necrosis
3) Lung: Moderate amounts of intraluminal necrotic cellular and karyorrhectic debris
4) Liver: Melanomacrophage hyperplasia
5) Body as a whole: Poor body condition with atrophied adipose

REMARKS: On 7/11/2017 By ANC

7/11/17: Histology revealed the mass to be composed of proliferating epithelium forming dilated tubules that largely efface the pancreas. Proliferating cells have bland cytologic features that are suggestive

of ductular hyperplasia or a ductular adenoma; however, a well-differentiated adenocarcinoma cannot be completely ruled out. Based on the morphology, the likely origin is a pancreatic or biliary duct; however their close proximity and similar appearance in amphibians makes them difficult to tell apart. Hepatic necrosis is likely secondary to obstruction of the biliary system due to a space occupying or infiltrative effect of the mass. Abundant necrotic cellular debris within the lungs may be a postmortem artifact as there was no inflammation to suggest true pneumonia. The possibility of renal disease contributing tetany could not be adequately evaluated as only a small sliver of renal tissue was represented on the slide (processing artifact of very small tissues).

Andrew Cartoceti	Andrew Cartoceti	7/11/2017
PROSECTOR	PATHOLOGIST	DATE COMPLETED

Printed on: 7/11/2017 2:40:31 PM CARES-MED v2.119

Pathology Module - Final Pathology Report
NATIONAL ZOOLOGICAL PARK

PATH # N2017-0110

Death Date: 6/18/2017
Necropsy Date: 6/18/2017

ORYX DAMMAH
Scimitar-horned oryx
Name: Jena

Gender: Female

Age: 10Y 3M 16D

Chip: 094-320-875 Avid

Accession No.: 114426

Birth:
02 Mar 2007

Acquired: 10 Jun 2009

Removed:
18 Jun 2017

On loan from KANSAS CITY ZOOLOGICAL GARDENS, KANSAS CITY

SEX: Female AGE: 10Y 3M 16D WEIGHT: 135 kg STAY:

MANNER OF DEATH:Euthanasia
TIME OF DEATH:
DEATH LOCATION:MH01-03
SUBMITTOR:Joyner, P-SCBI
OWNER/ANIMAL DEPT:DCM

INTERVAL:0-6 hours
XRAYED:False
DISPOSITION:INCINERATE
PROSECTOR:Holder

HISTORY AND CLINCICAL OBSERVATIONS:

KEEPER OBSERVATIONS: On 6/18/2017 By DR

This adult female was housed in a herd with 11 other adult females and 4 calves.

She was suspected to be pregnant and due any time. Ambient temp was a humid 84 degrees F.

She presented with a small spot of blood on her left rump at 0830hrs 6/17/17. She was behaving normally. Her udder had been enlarged for the last couple of weeks.

When checked at 1130hrs she was lying with the herd. Once gotten up she had a slight pink discharge from vulva. No contractions indicating active labor were observed.

At 1330hrs, she was lying with herd and occasionally shifting her weight and appearing to have mild to moderate contractions

At 1530hrs, she joined the herd as they were feed their pellet rations. no further discharge or contractions observed. She was observed eating.

At 1730 hrs, she was again lying out in the pasture with the herd, no fresh discharge or contractions observed while keeper was watching. She was calm and did not appear distressed.

At 2030hrs, she was lying in stall with herd but was slightly off in a corner. her right leg was stretched out and by the disturbed substrate it appeared she had been having contractions. She was occasionally lying with her head down and having moderate contractions.

At 2200hrs sedation and extraction of a dead male fawn was carried out at the barn.

Female was recovered and kept separate from the herd overnight.

CLINICIAN OBSERVATIONS: On 6/18/2017 By PJ

Cow 114426 noted to be in early labor 17 June 2017. No calf production by 9 pm and cow was distressed. Ambulatory but right hind lameness. Induced anesthesia with Butorphanol, Azaperone and Medetomidine and manually removed calf. Reversed anesthesia in cow, recovery uneventful.

June 18 early morning check cow had reduced mentation consistent with recirculating of alpha 2 but too responsive to allow hand injection. Administered atipamezole IM via dart resulting in excitation and running around stall. Moved to smaller enclosure where cow lost footing and ruptured right then left stifle tendons. Euthanasia elected due to grave prognosis. Anesthetized with Butorphanol, ketamine, xylazine, azaperone and propofol. Euthanasia performed with Euthasol 11 mls IV via jugular vein.

GROSS DESCRIPTION: On 6/18/2017 By KAH

A 135 kilogram, adult, intact female scimitar-horned oryx is necropsied on 18 May 2017 following parturition and euthanasia. An orange tag in the left ear reads 0017, and a subcutaneous transponder reads 094-320-875. The carcass is in good postmortem condition and good body condition with well-fleshed muscles and abundant subcutaneous and intra-abdominal adipose tissue.

External examination reveals abrasions on the medial surface of both stifle joints, with the right more severely affected. There is blood and placenta extruding from the vulva and blood matting the surrounding fur. The udder is full, and milk/colostrum can be expressed from the teats. There is mild submandibular edema.

Upon manipulation, the right stifle is markedly unstable with abnormal lateral mobility and palpably displaced patella. Reflection of the skin reveals extensive subcutaneous, intermuscular, and intramuscular hemorrhage extending from the inguine to the mid-tibia. Stabilizing lateral ligaments of the patella and the caudal cruciate ligament of the stifle are ruptured. On the left pelvic limb, there is similar though less extensive hemorrhage, predominantly surrounding the medial attachment of the gastrocnemius muscle to the distal femur. The medial quadriceps also has intramuscular tearing and hemorrhage. Within the left stifle joint, the posterior cruciate ligament is completely detached and has avulsed a 3 x 5 x 3 mm portion of its attachment point in the caudal intercondylar area.

The abdominal cavity contains moderate amounts of serosanguinous fluid. The connective tissues of the pelvic canal, retroperitoneum, and uterine ligaments are severely hemorrhagic. The uterus is intact, and some placentomes are still intact. There is multifocal squamous metaplasia of the intercaruncular epithelium. There is partial thickness rupture of the urinary bladder muscularis, and the serosal surface of the urinary bladder and attendant connective tissue is markedly hemorrhagic. The urinary bladder is completely contracted, and the interior mucosa is intact. There is a discrete, pale, firm, 2.5 x 2 x 3.5 cm nodule of degenerate fat within the retroperitoneal tissue.

There is a solitary, dark red, 2 cm diameter, slightly firm nodule in the right dorsal lung field. The abomasal mucosa has scattered 2-5 mm depressed, dark brown ulcerations.

Due to the intact horns and a request for the skull, brain was not examined. Samples of the brainstem and cerebellum were retrieved via the foramen magnum. Ovaries were removed for repro team and will not be represented histologically.

All other tissues are grossly within normal limits.

GROSS DIAGNOSIS: By KAH

1. Status post-parturient, dystocia: Intrapelvic, peri-uterine, peri-urocystic, and retroperitoneal hemorrhage, acute, severe.

2. Right pelvic limb: Lateral patellar and caudal cruciate ligament rupture with patellar dislocation and extensive hemorrhage.

3. Left pelvic limb: Caudal cruciate ligament avulsion of tibial attachment with muscular tearing and marked intramuscular hemorrhage.

4. Urinary bladder: Partial thickness rupture, muscularis.

5. Lung: Pulmonary hemorrhage, focal.

6. Abdominal cavity: Abdominal effusion, moderate.

7. Abomasum: Ulcerative abomasitis, multifocal, mild.

8. Retroperitoneal fat: Nodular fat necrosis.

9. Subcutis: Submandibular edema, mild.

LABORATORY STUDIES:

TISSUE STATUS:

SHELVED:	False
TRIMMED:	True
FROZEN:	False
ULTRAFROZEN:	True
Tissues Ultrafrozen:	Liver, kidney, lung, placenta

SPECIAL REQUESTS: On By

HISTOLOGY: On 7/11/2017 By KAH

1. LIVER

2. KIDNEY

3. HEART, SKELETAL MUSCLE

4. ADRENAL, SPLEEN, MESENTERIC LYMPH NODE

5. THYROID, MAMMARY GLAND, ESOPHAGUS

6. LUNG

7. TRACHEA, URINARY BLADDER

8. PLACENTA

9. GI

10. FAT MASS, PANCREAS, GI

11. RUMEN, RETICULUM, OMASUM

12. GI, CRUCIATE LIGAMENT

13. BRAINSTEM

MORPHOLOGIC DIAGNOSIS:

1) Small intestine: Enteritis, lymphoplasmacytic and eosinophilic, moderate. (Slide 9)

2) Urinary bladder: Mural hemorrhage (Slide 7)

3) Liver: Cholecystitis, suppurative, mild, with cystic mucosal hyperplasia. (Slide 1)

4) Reticulum: Reticulitis, lymphocytic, minimal. (Slide 11)

5) Omasum: Omasitis, lymphocytic, minimal. (Slide 11)

REMARKS: On 7/11/2017 By KAH

As reported grossly, the stifle injuries were severe and created major limb instability, supporting the grave clinical prognosis noted at the time of euthanasia.

An etiology for the enteritis is not apparent, however the eosinophilic component may indicate a parasitic contribution. There are no significant abnormalities in the placenta.

Holder	Holder	7/11/2017
PROSECTOR	PATHOLOGIST	DATE COMPLETED

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Pathology Module - Final Pathology Report
NATIONAL ZOOLOGICAL PARK

PATH # N2017-0111

Death Date: 6/18/2017
Necropsy Date: 6/19/2017

ORYX DAMMAH
Scimitar-horned oryx
Name:

Gender: Male

Age: 0Y 0M 1D

Accession No.: 115537

Birth:
17 Jun 2017

Acquired:

Removed:
17 Jun 2017

SEX: Male	AGE: 0Y 0M 1D	WEIGHT: 0 gm	STAY:
MANNER OF DEATH: Died			INTERVAL: 24-48 Hours
TIME OF DEATH: 00:00			XRAYED: False
DEATH LOCATION: Meade			DISPOSITION: INCENERATE
SUBMITTOR: Joyner, P-SCBI			PROSECTOR: Holder
OWNER/ANIMAL DEPT: DCO			

HISTORY AND CLINCICAL OBSERVATIONS:

KEEPER OBSERVATIONS: On By

CLINICIAN OBSERVATIONS: On 6/18/2017 By PJ

Cow 114426 noted to be in early labor 17 June 2017. No calf production by 9 pm and cow was distressed. Induced anesthesia with Butorphanol, Azaperone and Medetomidine. Calf had head and right forelimb in pelvic canal but left forelimb was flexed at elbow and shoulder. Manually removed calf and gave atipamezole and naltrexone IM but no heart beat detected. Confirmed male. Size appeared wnl.

GROSS DESCRIPTION: On 6/19/2017 By KAH

Received for necropsy is a male, full-term, scimitar-horned oryx fetus. The postmortem condition is good. Body condition is normal for a fetus (scant adipose). The lungs are dark, firm, and sink in formalin. There is moderate subcutaneous periorbital hemorrhage.

GROSS DIAGNOSIS: By

1: Lungs: Fetal atalectasis.

2: Head: Periorbital hemorrhage, traumatic.

LABORATORY STUDIES:

TISSUE STATUS:

SHELVED:	False
TRIMMED:	True
FROZEN:	False
ULTRAFROZEN:	True
Tissues Ultrafrozen:	liver, kidney, lung, eyelid, placenta

SPECIAL REQUESTS: On 6/18/2017 By BP

Testes to repro.

HISTOLOGY: On 7/11/2017 By KAH

1. LIVER, THYROID, SPLEEN
2. KIDNEY, LUNG
3. TONGUE, HEART, PANCREAS
4. RETICULUM, RUMEN, OMASUM, INTESTINE
5. UMBILICUS
6. INTESTINE, ADRENAL
7. MARROW, MUSCLE NERVE, INTESTINE
8. BRAIN
9. BRAIN, PITUITARY

MORPHOLOGIC DIAGNOSIS:

1) FETUS, NORMAL

REMARKS: On 7/11/2017 By KAH

There are no histological abnormalities identified.

Holder	Holder	7/11/2017
PROSECTOR	PATHOLOGIST	DATE COMPLETED

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Pathology Module - Final Pathology Report
NATIONAL ZOOLOGICAL PARK

PATH # N2017-0112

Death Date: 6/8/2017
Necropsy Date: 6/8/2017

CARDUELIS CUCULLATA
Red siskin
Name:

Gender: Male

Age: 5Y 10M 25D

Accession No.: 216444

Birth:
14 Jul 2011

Acquired: 12 Sep 2015

Removed:
08 Jun 2017

SEX: Male	AGE: 5Y 10M 25D	WEIGHT: 0 gm	STAY: > 30 Days
MANNER OF DEATH: Euthanasia			INTERVAL: 0-6 hours
TIME OF DEATH:			XRAYED: False
DEATH LOCATION: SCBI			DISPOSITION: ALL IN FORMALIN
SUBMITTOR: Joyner, P-SCBI			PROSECTOR: Joyner
OWNER/ANIMAL DEPT: DCO			

HISTORY AND CLINCICAL OBSERVATIONS:

KEEPER OBSERVATIONS: On 6/8/2017 By ER

-Housed indoors with 5.5.1 conspecifics

-No cage mate aggression observed involving this bird

-Diet of the entire flock recently changed to make the birds less seed dependent. Appetite appeared normal.

-See health history below

-DOB: 14 July 2011

This 6 year old Red siskin has been declining over the past few weeks, including a decrease in activity, increased respiratory effort, and a decrease in flight ability. Keeper staff noted the bird to be inactive and as having feathers fluffed . On May 5th, the bird was examined by veterinary staff. Initial examination revealed pulmonary edema, a small mass palpated in the abdomen, and dehydration. He was given fluids and treated with Tylosin. Following treatment the bird showed some improvement (pulmonary edema and dehydration re-solved). However, his behavior showed little to no improvement. Starting on 4 June, he was observed having difficulty flying to and from the food pans (flight was slow and clumsy, balance and coordination was less than normal). He also had difficulty preening due to the lack of ability to balance himself. This individual is considered to be geriatric and post-reproductive. The animal's quality of life is compromised by an inability to perform normal activity and a deteriorating body condition. With an overall grave prognosis euthanasia was requested based on animal welfare and quality of life considerations.

Brian Coyle from NMNH collected various tissue samples immediately after the euthanasia at SCBI for use on the Red siskin genome.

CLINICIAN OBSERVATIONS: On 6/8/2017 By PHJ

Geriatric male red siskin presented fluffed and depressed May 5, 2017. Exam revealed mild pododermatitis and suspected abdominal mass. Labwork showed dehydration and elevated WBC (15). Cloacal culture no growth. Treated with Tylosin in water. Repeat exam 19 May revealed mildly improved attitude and demeanor and muffled heart sounds. Labwork demonstrated Chlamydia PCR negative. Elected to monitor for a period; however, no improvement in health and animal eventually became less active. Elected to euthanize due to deteriorating quality of life.

June 8, 2017 administered isoflurane in chamber until bird reached deep plane of anesthesia. Performed right jugular venipuncture (total 0.3 mls collected) using insuline syringe for cbc, chemistry. Respiratory arrest was followed by cardiac arrest. Death confirmed by auscultation.

Full complement of organs and tissues collected for researcher B. Coyle at NMNH immediately after euthanasia. Samples were placed in RNA later. Remaining tissues placed in formalin for histopathology. There may be insufficient tissues for full histopathologic evaluation.

GROSS DESCRIPTION: On 6/8/2017 By PJ

Entire carcass in formalin

GROSS DIAGNOSIS: By

LABORATORY STUDIES:

OTHER: Tissues taken in RNA later for NMNH.

TISSUE STATUS:

SHELVED: False

TRIMMED: True

FROZEN: False

False

ULTRAFROZEN:

Tissues
Ultrafrozen:

SPECIAL REQUESTS: On By

HISTOLOGY: On 8/14/2017 By Exemption 6

Sheets of histiocytic inflammation are present throughout the great vessels, heart, intestine, adrenal, kidney, lung, liver, skeletal muscle, choroid of the eye, bone marrow, and facial soft tissues. Histiocytes contain filamentous bacteria. Kidney: Low numbers of tubules are dilated. Pancreas: Some of the acinar cells are degenerative. The following tissues are histologically within normal limits: heart.

MORPHOLOGIC DIAGNOSIS:

1) Disseminated mycobacteriosis

REMARKS: On 8/14/2017 By Exemption 6

Histologic findings are characteristic of disseminated mycobacteriosis. This is most likely M. avium or M. genavense. Culture and/or PCR would be needed to further identify the species. These procedures are best performed from frozen tissue, although the PCR can be performed from paraffin-embedded tissue with less sensitivity. Please notify the laboratory if you would like PCR attempted from the paraffin block (block #1).

*Histopathology and comment from Exemption 6 Exemption 6.

Joyner	Holder	8/14/2017
PROSECTOR	PATHOLOGIST	DATE COMPLETED

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Pathology Module - Final Pathology Report
NATIONAL ZOOLOGICAL PARK

PATH # N2017-0113

Death Date: 6/17/2017
Necropsy Date: 6/17/2017

MUSTELA NIGRIPES
Black-footed ferret
Name:

Gender: Male

Age: 0Y 0M 10D

Accession No.: 115516

Birth:
07 Jun 2017

Acquired: 07 Jun 2017

Removed:
17 Jun 2017

SEX: Male	AGE: 0Y 0M 10D	WEIGHT: 0 gm	STAY:
MANNER OF DEATH:	Euthanasia	INTERVAL:	
TIME OF DEATH:		XRAYED:	False
DEATH LOCATION:		DISPOSITION:	ALL IN FORMALIN
SUBMITTOR:		PROSECTOR:	Joyner
OWNER/ANIMAL DEPT:			

HISTORY AND CLINCICAL OBSERVATIONS:

KEEPER OBSERVATIONS: On By

CLINICIAN OBSERVATIONS: On 6/17/2017 By PJ

Initial presentation on June 13, 2017 - dam presented with facial abscess and 4 recently born kits. Kits and dam initially treated with amoxicillin, kits also received simethicone.

Over course of last 4 days, one kit (115518), smaller than the rest, died. Necropsy revealed watery, dilated intestines and abdominal culture positive for E. coli (sensitivity pending). This kit developed ocular abscess with weight loss. Medication changed to ceftazadime injections BID. Remaining 2 kits and jill doing well but this kit continued to deteriorate. Exam today showed weight loss with poor body condition, reduced activity level and dried abnormal fecal material on tail and hindquarters. Euthanasia performed due to grave prognosis.

Chamber induction with isoflurane. Once unconscious, administered KCl into abdomen. Confirmed cardiorespiratory arrest.

GROSS DESCRIPTION: On By

GROSS DIAGNOSIS: By

LABORATORY STUDIES:

TISSUE STATUS:

SHELVED:	False
TRIMMED:	False
FROZEN:	False
ULTRAFROZEN:	False

Tissues
Ultrafrozen:

SPECIAL REQUESTS: On By

HISTOLOGY: On 7/12/2017 By KAH

1. TONGUE, TRACHEA, LUNG, HEART

2. LIVER, INTESTINE, PANCREAS

3. KIDNEY, HEAD

4. HEAD

MORPHOLOGIC DIAGNOSIS:

1) Nasal cavity: Rhinitis, suppurative, moderate to severe, with mucosal piling and disorganization. (Slides 3 & 4)

2) Kidney: Pyelitis, mild, with renal tubular mineralization, multifocal, mild. (Slide 3)

3) Eye: Dacryoadenitis, suppurative, focal (slide 4)

4) Liver: Extramedullary hematopoiesis, marked. (Slide 2)

REMARKS: On 7/12/2017 By KAH

While no bacterial rods were identified in section, histopathology is an insensitive diagnostic for detecting bacteria, and the respiratory disease is consistent with other kits suffering from E. coli.

Etiology of the renal mineralization is uncertain, but poor suckling may have resulted in dehydration.

Joyner	Holder	7/12/2017
PROSECTOR	PATHOLOGIST	DATE COMPLETED

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Pathology Module - Final Pathology Report
NATIONAL ZOOLOGICAL PARK

PATH # N2017-0114

Death Date: 6/18/2017
Necropsy Date: 6/19/2017

LANIUS LUDOVICIANUS MIGRANS
Loggerhead shrike
Name:

Gender: Unknown
Sex

Accession No.: 216611

Age: 0Y 0M 18D

Birth:
31 May 2017

Acquired: 31 May 2017

Removed:
18 Jun 2017

SEX: Unknown Sex AGE: 0Y 0M 18D WEIGHT: 48.4 gm STAY:

MANNER OF DEATH:Found Dead
TIME OF DEATH:
DEATH LOCATION:DCO-SCBI
SUBMITTOR:Joyner, P-SCBI
OWNER/ANIMAL DEPT:DCO

INTERVAL:24-48 Hours
XRAYED:False
DISPOSITION:INCINERATE
PROSECTOR:Holder

HISTORY AND CLINCICAL OBSERVATIONS:

KEEPER OBSERVATIONS: On By

CLINICIAN OBSERVATIONS: On 6/18/2017 By kh

Wild rat snake entered enclosure, consumed two fledgling chicks (216611, 216612), three other fledgling chicks (216613, 216614, 216615) found dead/presumptive stress and/or trauma. Adult parents and one surviving fledgling chick under observation.

Fledgling chicks (216611, 216612) remain in snake/no reason for necropsy. Snake to path for disposal only.

GROSS DESCRIPTION: On 6/19/2017 By KAH

Presented for necropsy is a 48.4 g juvenile loggerhead shrike removed from the stomach of a black rat snake. The carcass is partially digested but in good body condition. Lungs are dark red and hemorrhagic.

GROSS DIAGNOSIS: By KAH

Whole body: Predation trauma (ingested).

Lungs: Pulmonary congestion and hemorrhage.

LABORATORY STUDIES:

TISSUE STATUS:

SHELVED:	False
TRIMMED:	True
FROZEN:	False
ULTRAFROZEN:	False

Tissues
Ultrafrozen:

SPECIAL REQUESTS: On By

HISTOLOGY: On 8/7/2017 By [redacted]

LUNG: The lung has diffuse congestion and variable atelectasis. Some of the bronchi are filled with granulomatous inflammation and necrosis oriented around branching septate fungal elements resemble Aspergillus sp.

KIDNEY: The interstitium has mild multifocal lymphocytic inflammation.

LIVER: Some mild lymphocytic inflammation is in the portal tracts, and some of the Kupffer cells are hypertrophied and contain phagocytized cell debris.

TRACHEA: The trachea has some mild mucosal hyperplasia, erosion, and exfoliation. The following tissues are histologically within normal limits: alimentary tract, thyroid, great vessels, spleen, and adipose.

MORPHOLOGIC DIAGNOSIS:

1) Lung: Pulmonary aspergillosis.

REMARKS: On 8/7/2017 By [redacted]

Although this bird may have been killed by a snake, it had acute fulminant pulmonary aspergillosis, which may have predisposed it to a traumatic event. It is also possible that the bird was dead prior to ingestion by the snake. This bird was in excellent nutritional status at the time of death.

Histopathology and comment by [redacted]

Holder	Holder	8/7/2017
PROSECTOR	PATHOLOGIST	DATE COMPLETED

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Pathology Module - Final Pathology Report
NATIONAL ZOOLOGICAL PARK

PATH # N2017-0115

Death Date: 6/18/2017
Necropsy Date: 6/19/2017

LANIUS LUDOVICIANUS MIGRANS
Loggerhead shrike
Name:

Gender: Unknown
Sex

Accession No.: 216612

Age: 0Y 0M 18D

Birth:
31 May 2017

Acquired: 31 May 2017

Removed:
18 Jun 2017

SEX: Unknown Sex AGE: 0Y 0M 18D WEIGHT: 44.7 gm STAY:
MANNER OF DEATH: Found Dead
TIME OF DEATH:
DEATH LOCATION: DCO-SCBI
SUBMITTOR: Joyner, P-SCBI
OWNER/ANIMAL DEPT: DCO
INTERVAL: 24-48 Hours
XRAYED: False
DISPOSITION: INCINERATE
PROSECTOR: Holder

HISTORY AND CLINCICAL OBSERVATIONS:

KEEPER OBSERVATIONS: On By

CLINICIAN OBSERVATIONS: On 6/18/2017 By PJ

Wild rat snake entered enclosure, consumed two fledgling chicks (216611, 216612), three other fledgling

chicks (216613, 216614, 216615) found dead/presumptive stress and/or trauma. Adult parents and one

surviving fledgling chick under observation.

Fledgling chicks (216611, 216612) remain in snake/no reason for necropsy. Snake to path for disposal

only.

GROSS DESCRIPTION: On 6/19/2017 By KAH

Presented for necropsy is a 44.7 g juvenile loggerhead shrike removed from the stomach of a black rat snake. The carcass is minimally digested and in good body condition. Lungs are dark red and hemorrhagic.

GROSS DIAGNOSIS: By KAH

Whole body: Predation trauma (ingested).

Lungs: Pulmonary congestion and hemorrhage.

LABORATORY STUDIES:

TISSUE STATUS:

SHELVED:	False
TRIMMED:	True
FROZEN:	False
ULTRAFROZEN:	False

Tissues
Ultrafrozen:

SPECIAL REQUESTS: On By

HISTOLOGY: On 8/7/2017 By Exemption 6

LUNG: Diffusely, the pulmonary parenchyma is markedly congested and atelectatic. The following tissues are histologically within normal limits: musculoskeletal system, central nervous system, ears, eyes, oral and nasal cavities, pancreas, proventriculus, ventriculus, ganglia, intestine, spleen, ovary, oviduct, heart, kidney, trachea, thyroid, great vessels, adipose, and skin.

MORPHOLOGIC DIAGNOSIS:

1) Lung: Acute pulmonary congestion and atelectasis.

REMARKS: On 8/7/2017 By Exemption 6

Histologic findings are consistent with acute pulmonary shock and likely are related to trauma (predation). This bird was in excellent nutritional status at the time of death and had no underlying disease processes that would have predisposed it to a

traumatic event.

Histopathology and comment by [redacted]

Holder	Holder	8/7/2017
PROSECTOR	PATHOLOGIST	DATE COMPLETED

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Pathology Module - Final Pathology Report
NATIONAL ZOOLOGICAL PARK

PATH # N2017-0116

Death Date: 6/18/2017
Necropsy Date: 6/19/2017

LANIUS LUDOVICIANUS MIGRANS
Loggerhead shrike
Name:

Gender: Unknown
Sex

Accession No.: 216613

Age: 0Y 0M 18D

Birth:
31 May 2017

Acquired: 31 May 2017

Removed:
18 Jun 2017

SEX: Unknown Sex AGE: 0Y 0M 18D WEIGHT: 41.3 gm STAY:
MANNER OF DEATH:Found Dead INTERVAL:24-48 Hours
TIME OF DEATH: XRAYED:False
DEATH LOCATION:DCO-SCBI DISPOSITION:INCINERATE
SUBMITTOR:Joyner, P-SCBI PROSECTOR:Holder
OWNER/ANIMAL DEPT:DCO

HISTORY AND CLINCICAL OBSERVATIONS:

KEEPER OBSERVATIONS: On By

CLINICIAN OBSERVATIONS: On 6/18/2017 By PJ

Wild rat snake entered enclosure, consumed two fledgling chicks (216611, 216612), three other fledgling

chicks (216613, 216614, 216615) found dead/presumptive stress and/or trauma. Adult parents and one

surviving fledgling chick under observation.

Fledgling chicks (216611, 216612) remain in snake/no reason for necropsy. Snake to path for disposal

only.

GROSS DESCRIPTION: On 6/19/2017 By KAH

Presented for necropsy is a 41.3 g juvenile loggerhead shrike. The carcass is in good postmortem and in good body condition. There is some hemorrhage in the dorsal lung fields. Spinal separation is noted at T3-4. There is bilateral perirenal hemorrhage.

GROSS DIAGNOSIS: By KAH

Kidneys: Bilateral perirenal hemorrhage.

Lumbar spine: Separation at T3-4.

Lungs: Multifocal pulmonary congestion.

LABORATORY STUDIES:

TISSUE STATUS:

SHELVED:	False
TRIMMED:	True
FROZEN:	False
ULTRAFROZEN:	False

Tissues
Ultrafrozen:

SPECIAL REQUESTS: On By

HISTOLOGY: On 8/7/2017 By Exemption 6

LUNG: Diffusely, the parenchyma is congested, atelectatic, and multifocally suffused with extravasated blood.

SPLEEN: Slightly increased numbers of histiocytes, some with phagocytized cell debris, are in the red pulp.

LIVER: Mild, periportal to random infiltrates of lymphocytes are noted, sometimes associated with mild hepatocellular necrosis and Kupffer cell activation with cellular phagocytosis.

COELOMIC CAVITY: Some of the serosal surfaces are suffused with extravasated blood, and some mild multifocal perivascular lymphoid cuffing is noted on serosal surfaces. Adrenal: Interrenal cells are mildly hypertrophied and vacuolated.

SKIN: One section of skin has some mild perivascular lymphoid cuffing. The following tissues are histologically within normal limits: esophagus, great vessels, thymus, ganglia, pancreas, intestine, ovary, eyes, ears, oral and nasal cavities, central nervous system, trachea, esophagus, heart, and adipose.

MORPHOLOGIC DIAGNOSIS:

1) Lung: Acute pulmonary congestion, hemorrhage, and atelectasis

2) Spleen: Mild histiocytic splenitis.

3) Liver: Mild, periportal to random hepatitis.

4) Coelom: Acute coelomic hemorrhage.

5) Adrenal: Stress response.

6) Skin: Mild perivascular lymphocytic dermatitis.

REMARKS: On 8/7/2017 By Exemption 6

Histologic findings are consistent with acute pulmonary shock likely due to stress or trauma. There is also a stress response in the adrenal gland. This bird also had some evidence of low-grade systemic antigenic stimulation, likely low-grade sepsis, although a source for a septic process is not present in the tissues. For future reference, we recommend submitting the cloaca, umbilicus, and yolk sac for all neonatal birds, as these are target tissues for various infectious processes.* This bird was in good nutritional status and was a female.

Exemption 6

*[Note by KAH] This bird was a juvenile, not a neonate, and no yolk sac was present.

Holder	Holder	8/7/2017
PROSECTOR	PATHOLOGIST	DATE COMPLETED

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Pathology Module - Final Pathology Report
NATIONAL ZOOLOGICAL PARK

PATH # N2017-0117

Death Date: 6/18/2017
Necropsy Date: 6/19/2017

LANIUS LUDOVICIANUS MIGRANS
Loggerhead shrike
Name:

Gender: Unknown
Sex

Accession No.: 216614

Age: 0Y 0M 18D

Birth:
31 May 2017

Acquired: 31 May 2017

Removed:
18 Jun 2017

SEX: Unknown Sex AGE: 0Y 0M 18D WEIGHT: 44.9 gm STAY:

MANNER OF DEATH: Found Dead
TIME OF DEATH:
DEATH LOCATION: DCO-SCBI
SUBMITTOR: Joyner, P-SCBI
OWNER/ANIMAL DEPT: DCO

INTERVAL: 24-48 Hours
XRAYED: False
DISPOSITION: INCINERATE
PROSECTOR: Holder

HISTORY AND CLINCICAL OBSERVATIONS:

KEEPER OBSERVATIONS: On By

CLINICIAN OBSERVATIONS: On 6/18/2017 By PJ

Wild rat snake entered enclosure, consumed two fledgling chicks (216611, 216612), three other fledgling

chicks (216613, 216614, 216615) found dead/presumptive stress and/or trauma. Adult parents and one

surviving fledgling chick under observation.

Fledgling chicks (216611, 216612) remain in snake/no reason for necropsy. Snake to path for disposal

only.

GROSS DESCRIPTION: On 6/19/2017 By KAH

Presented for necropsy is a 44.9 g juvenile loggerhead shrike. The carcass is in good postmortem and in good body condition. The left eye is missing, and there is some hemorrhage around beak. The muscle tissue is pale.

GROSS DIAGNOSIS: By KAH

Left eye: Absent.

Beak: Hemorrhage, mild.

LABORATORY STUDIES:

TISSUE STATUS:

SHELVED:	False
TRIMMED:	True
FROZEN:	False
ULTRAFROZEN:	False

Tissues
Ultrafrozen:

SPECIAL REQUESTS: On By

HISTOLOGY: On 8/7/2017 By Exemption 6

ADRENAL: The adrenal gland is congested.

LUNG: The lung has marked congestion, hemorrhage, and atelectasis.

HEART: Scattered low numbers of myofibers are necrotic.

LIVER: Some of the Kupffer cells are hypertrophied and contain phagocytized cell debris. The portal tracts have a mild infiltrate of lymphocytes.

SPLEEN: Slightly increased numbers of histiocytes, some with phagocytized debris are in the red pulp. The following tissues are histologically within normal limits: musculoskeletal system, central nervous system, ears, one eye, oral and nasal cavities, proventriculus, ventriculus, ganglia, bursa, intestine, cloaca, brain, great vessels, adipose, kidney, testicle (inactive), tongue, esophagus, bone marrow, and skin.

MORPHOLOGIC DIAGNOSIS:

1) Lung: Acute pulmonary congestion, hemorrhage, and atelectasis.

2) Heart: Acute mild myocardial necrosis.

3) Adrenal: Acute congestion, adrenal.

4) Liver: Mild portal lymphocytic hepatitis with Kupffer cell activation.

5) Spleen: Mild histiocytic splenitis.

REMARKS: On 8/7/2017 By Exemption 6

Histologic findings are consistent with acute cardiopulmonary shock, and based on the history, these findings are attributed to trauma or stress. The bird also has some evidence of low-grade antigenic stimulation in the spleen and liver of undetermined cause. The bird was in excellent nutritional status and was a male.

Histopathology and comment by Exemption 6

Holder	Holder	8/7/2017
PROSECTOR	PATHOLOGIST	DATE COMPLETED

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Pathology Module - Final Pathology Report
NATIONAL ZOOLOGICAL PARK

PATH # N2017-0118

Death Date: 6/18/2017
Necropsy Date: 6/19/2017

LANIUS LUDOVICIANUS MIGRANS
Loggerhead shrike
Name:

Gender: Unknown
Sex

Accession No.: 216615

Age: 0Y 0M 18D

Birth:
31 May 2017

Acquired: 31 May 2017

Removed:
18 Jun 2017

SEX: Unknown Sex AGE: 0Y 0M 18D WEIGHT: 41.3 gm STAY:

MANNER OF DEATH: Found Dead
TIME OF DEATH:
DEATH LOCATION: DCO-SCBI
SUBMITTOR: Joyner, P-SCBI
OWNER/ANIMAL DEPT: DCO

INTERVAL: 24-48 Hours
XRAYED: False
DISPOSITION: INCINERATE
PROSECTOR: Holder

HISTORY AND CLINCICAL OBSERVATIONS:

KEEPER OBSERVATIONS: On By

CLINICIAN OBSERVATIONS: On 6/18/2017 By PJ

Wild rat snake entered enclosure, consumed two fledgling chicks (216611, 216612), three other fledgling

chicks (216613, 216614, 216615) found dead/presumptive stress and/or trauma. Adult parents and one

surviving fledgling chick under observation.

Fledgling chicks (216611, 216612) remain in snake/no reason for necropsy. Snake to path for disposal

only.

GROSS DESCRIPTION: On 6/19/2017 By KAH

Presented for necropsy is a 41.3 g juvenile loggerhead shrike. The carcass is in good postmortem and in good body condition. There is subcutaneous (8 mm diameter) and intracranial (3x2 mm) hemorrhage on the left side of the head.

GROSS DIAGNOSIS: By KAH

Head: Subcutaneous and subdural hemorrhage, left hemisphere.

LABORATORY STUDIES:

TISSUE STATUS:

SHELVED:	False
TRIMMED:	True
FROZEN:	False
ULTRAFROZEN:	False

Tissues
Ultrafrozen:

SPECIAL REQUESTS: On By

HISTOLOGY: On 8/7/2017 By [redacted]

HEAD: Serial sections of the head reveal extensive facial soft tissue hemorrhage and some hemorrhage in the meninges.

RESPIRATORY TRACT: Acute congestion, hemorrhage, and atelectasis are in the lung, and hemorrhage is in the lumen of the trachea.

HEART: The epicardium is suffused with extravasated blood.

ADRENAL: The chromaffin cells have mild vacuolar change.

The following tissues are histologically within normal limits: proventriculus, ventriculus, ganglia, esophagus, intestine, skeletal muscle, pancreas, thymus, ovary, liver, kidney, adipose, and skin.

MORPHOLOGIC DIAGNOSIS:

1) Acute head trauma.

2) Lungs: Acute pulmonary hemorrhage.

REMARKS: On 8/7/2017 By [redacted]

Histologic findings corroborate the clinical suspicions. These findings are consistent with head trauma, possibly in conjunction with stress. This bird was in excellent nutritional status and was a female.

Histopathology and comment by [redacted]

Holder	Holder	8/7/2017
PROSECTOR	PATHOLOGIST	DATE COMPLETED

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Pathology Module - Final Pathology Report
NATIONAL ZOOLOGICAL PARK

PATH # N2017-0119

Death Date: 6/19/2017
Necropsy Date: 6/19/2017

THRAUPIS EPISCOPUS (no subsp)
Blue-grey tanager
Name:

Gender: Female

Age: 17Y 10M 22

Accession No.: 215829

Birth:
28 Jul 1999

Acquired: 22 Sep 2009

Removed: 19 Jun 2017

SEX: Female AGE: 17Y 10M 22 WEIGHT: 34.2 gm STAY:

MANNER OF DEATH:Found Dead
TIME OF DEATH:
DEATH LOCATION:BH01 xa (holding cage)
SUBMITTOR:Elizabeth Fisher DOO
OWNER/ANIMAL DEPT:DOO

INTERVAL:0-6 hours
XRAYED:False
DISPOSITION:INCINERATE
PROSECTOR:Holder

HISTORY AND CLINCICAL OBSERVATIONS:

KEEPER OBSERVATIONS: On 6/19/2017 By EF

Has a history of injury to left leg - has not been used since 2014.

Had been to hospital last week following odd posture and audible flying.

Came out of anesthesia fine and looked great following days - some hyperkeratosis removed from unused foot/leg. Seen eating and flying normal. Held in holding cage to separate from male - had seen some fairly aggressive breeding behavior from the male.

CLINICIAN OBSERVATIONS: On By

GROSS DESCRIPTION: On 6/19/2017 By KAH

Received for necropsy is an adult female 34.2 g blue grey tanager. A silver leg band on the right leg reads 19. Postmortem condition is good and body condition is slightly reduced with scant subcutaneous or intracoelomic adipose tissue. There is faint hemorrhage in the left naris. The skin on the left foot is thickened and hyperkeratotic. Visceral fat is nearly absent and dark yellow.

GROSS DIAGNOSIS: By KAH

1. Body as a whole: Serous atrophy of fat.

2. Left leg: Pedal hyperkeratosis, moderate.

3. Left naris: Hemorrhage, minimal.

LABORATORY STUDIES:

TISSUE STATUS:

SHELVED:	False
TRIMMED:	True
FROZEN:	False
ULTRAFROZEN:	False

Tissues
Ultrafrozen:

SPECIAL REQUESTS: On By

HISTOLOGY: On 7/12/2017 By KAH

1. HEART, TRACHEA, LUNG

2. LIVER, SMALL INTESTINE, CECUM, VENTRICULUS

3. LIVER, BRAIN, OVARY

4. HEAD (decal)

5. TOES (decal)

MORPHOLOGIC DIAGNOSIS:

1) Liver: Hepatitis, lymphocytic, multifocal, mild. (Slide 2)

2) Intestine: Enteritis, lymphocytic to heterophilic, mild. (Slide 2)

3) Ventriculus: Ventriculitis, lymphocytic to heterophilic, mild, with thinning of koilin layer. (Slide 2)

4) Ceca: Lymphoid hyperplasia, moderate. (Slide 2)

5) Eye: Conjunctivitis, mononuclear, moderate (Slide 4)

6) Toe: Pododermatitis, orthokeratotic, papillary, and lymphoplasmacytic, chronic, moderate. (Slide 5)

7) Whole body: Serous atrophy of fat.

REMARKS: On 7/12/2017 By KAH

A specific cause of death could not be identified. The scant fat and diminished muscle mass indicates a negative energy balance, and social pressure reducing feed intake should be considered.

Holder	Holder	7/12/2017
PROSECTOR	PATHOLOGIST	DATE COMPLETED

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Pathology Module - Final Pathology Report
NATIONAL ZOOLOGICAL PARK

PATH # N2017-0120

Death Date: 6/19/2017
Necropsy Date: 6/20/2017

GRUS MONACHA
Hooded crane
Name:

Sex

Gender: Unknown

Accession No.: 216622

Age: 0Y 0M 0D

Birth:
19 Jun 2017

Acquired:

Removed:
19 Jun 2017

SEX: Unknown Sex AGE: 0Y 0M 0D WEIGHT: 100.2 gm STAY:

MANNER OF DEATH: Found Dead
TIME OF DEATH:
DEATH LOCATION: DCO-WF06
SUBMITTOR: Lynch
OWNER/ANIMAL DEPT: DCO

INTERVAL: 24-48 Hours
XRAYED: False
DISPOSITION: INCINERATE
PROSECTOR: Holder

HISTORY AND CLINCICAL OBSERVATIONS:

KEEPER OBSERVATIONS: On 6/19/2017 By LYN

Egg #: 113

Laid: 18 May 2017

Hatched: 19 May 2017

Dam: 216029

Sire: 216180

18 June 2017: Egg pipped and was given to surrogate parents 216363 - 364 at ~1700.

19 June 2017: Checked nest at ~0930 and found traumatized dead chick in pond.

The surrogate parents have never hatched or raised anything and were provided a hatching egg from another pair in an effort to strengthen the pair bond between the pair, and give them parental experience.

Egg shell fragments were found on the edge of the pond and the chick carcass was found in the pond. The chick had sustained severe trauma, presumably inflicted by the surrogate parents. Obvious injuries include: missing eyes and most of the skin from the head; broken maxillary bill; wing trauma; lacerations and contusions to the thorax, head and neck.

CLINICIAN OBSERVATIONS: On By

GROSS DESCRIPTION: On 6/20/2017 By KAH

Presented for necropsy is a 100 g hooded crane neonate of undetermined sex. Crown rump length is approximately 13 cm. The postmortem condition and body condition are good. There is subcutaneous and intracoelomic fat. The body is submitted with several eggshell remnants, and the yolk sac is incompletely absorbed. The head is missing both eyes as well as facial skin, and the maxillary bill is partially separated from the head.

There is hemorrhage surrounding an oblique fracture of the right humerus. There is scattered subcutaneous hemorrhage along the right side of the body from the ribcage to the head. The lungs are bilaterally separated from the ribs by blood clots. Within the skull, there are several small subdural blood clots up to 2 mm in diameter. The gastrointestinal tract is empty.

GROSS DIAGNOSIS: By KAH

Right wing: Complete oblique humeral fracture.

Right body: Multifocal subcutaneous hemorrhage.

Coelomic cavity: Pleural hemorrhage.

Body as a whole: Eyes absent.

LABORATORY STUDIES:

TISSUE STATUS:

SHELVED:	False
TRIMMED:	True
FROZEN:	False
ULTRAFROZEN:	False

Tissues

Ultrafrozen:

SPECIAL REQUESTS: On By

HISTOLOGY: On 7/12/2017 By KAH

1. LIVER, HEART, TRACHEA, THYROID

2. LUNG, PROVENTRICULUS

3. VENTRICULUS, INTESTINE, KIDNEY, ADRENAL

4. UMBILICUS, YOLK SAC, BRAIN, HEAD

MORPHOLOGIC DIAGNOSIS:

1) Brain: Perivascular hemorrhage.

REMARKS: On 7/12/2017 By KAH

The perivascular hemorrhage in the brain is likely traumatic, as with the remainder of the injuries evident grossly.

Holder	Holder	7/12/2017
PROSECTOR	PATHOLOGIST	DATE COMPLETED

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Pathology Module - Final Pathology Report
NATIONAL ZOOLOGICAL PARK

PATH # N2017-0121

Death Date: 6/20/2017
Necropsy Date: 6/20/2017

LORICARIA (unk sp)
Catfish
Name:

Gender: Unknown

Sex

Accession No.: 500857

Age:

Birth:

Acquired: 26 Jun 2015

31 Dec 2016

SEX: Unknown Sex AGE: ADULT WEIGHT: 17.2 gm STAY:

MANNER OF DEATH: Found Dead
TIME OF DEATH:
DEATH LOCATION:
SUBMITTOR:
OWNER/ANIMAL DEPT: DOA

INTERVAL: 6-24 hours
XRAYED: False
DISPOSITION: INCINERATE
PROSECTOR: Holder

HISTORY AND CLINCICAL OBSERVATIONS:

KEEPER OBSERVATIONS: On 6/20/2017 By CS

Animal found dead in tank at AM checks.

CLINICIAN OBSERVATIONS: On By

GROSS DESCRIPTION: On 6/20/2017 By KAH

Presented for necropsy is a 17.2 g marble whiptail catfish. External preservation is good, but the gills and internal organs are severely autolyzed. Organs are removed from body to enhance fixation. Free liquid fat is noted floating in the formalin after the specimen is submerged. Tissues are saved for possible histology.

GROSS DIAGNOSIS: By KAH

Body as a whole: Severe autolysis.

LABORATORY STUDIES:

TISSUE STATUS:

SHELVED: False

TRIMMED: True

FROZEN: False

ULTRAFROZEN: False

Tissues
Ultrafrozen:

SPECIAL REQUESTS: On By

HISTOLOGY: On 7/12/2017 By KAH

1. LIVER, GI

2. HEAD

3. SKELETAL MUSCLE, KIDNEY

MORPHOLOGIC DIAGNOSIS:

1) Body as a whole: Severe autolysis.

REMARKS: On 7/12/2017 By KAH

Severe autolysis in this animal rendered the histological sections nondiagnostic. No obvious evidence of granuloma formation was identified.

Holder	Holder	7/12/2017
PROSECTOR	PATHOLOGIST	DATE COMPLETED

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Pathology Module - Final Pathology Report
NATIONAL ZOOLOGICAL PARK

PATH # N2017-0122

Death Date: 6/21/2017
Necropsy Date: 6/21/2017

CARACAL CARACAL CARACAL
Caracal lynx
Name: Martina

Gender: Female

Age: 19Y 0M 6D

Chip: 403E160502

Accession No.: 113522

Birth:
15 Jun 1998

Acquired: 18 Nov 1999

Removed:
21 Jun 2017

SEX: Female	AGE: 19Y 0M 6D	WEIGHT: 10.5 kg	STAY:
MANNER OF DEATH:	Euthanasia	INTERVAL:	0-6 hours
TIME OF DEATH:		XRAYED:	True
DEATH LOCATION:	WHS	DISPOSITION:	INCINERATE
SUBMITTOR:	Hope	PROSECTOR:	Holder
OWNER/ANIMAL DEPT:			

HISTORY AND CLINCICAL OBSERVATIONS:

KEEPER OBSERVATIONS: On By

CLINICIAN OBSERVATIONS: On 6/21/2017 By KH

Hx of chronic renal insufficiency, urolithiasis (tx with K+ citrate)

Recent history of decreased appetite X 10 days, some weight loss. On exam, identified suspect repro tumors and possible renal/repro cyst on left kidney. Euthanized with euthasol IV.

GROSS DESCRIPTION: On 6/21/2017 By KAH

Presented for necropsy is a 10.5 kg intact female caracal in excellent postmortem condition and good body condition. There is adequate subcutaneous, intermuscular, and intra-abdominal fat, and muscle mass is adequate. Stomach contents are feathers, furr, and a partial spinal column of a small animal. The colon is full of well-formed, dry feces. Both maxillary canines are broken and blunted.

The uterus has multiple cysts and masses. There is a 3 cm diameter cyst at the right oviduct. The uterine body is filled with an irregular polypoid mass that is attached to the endometrium near the right uterine horn; the main bulbous portion of this mass is approximately 2.5 cm in diameter, with projections extending down the uterine body and up the left uterine horn. On cut surface, the mass is slightly off-white, firm and friable with cystic cavities. There is a cystic dilatation of the uterus at the mid body. Caudal to this, there is a 3 x 2.5 x 2 cm firm mass adjacent to the cervix.; the cut surface is homogenous and pale tan. The remainder of the uterine endometrium has scattered 2-3 mm cystic to polypoid projections.

The right stifle joint has marked clotted and unclotted blood noted surrounding the periarticular musculature and dissecting along fascial planes. The hemorrhage appears most intense by the distal femoral artery.

Both kidneys are small, but the left kidney's cranial pole is replaced by a 4.5 cm diameter renal cyst. The caudal pole of this kidney also has a 3 mm cortical cyst. The left renal pelvis contains numerous <2 mm nephroliths and grit.

The liver appears slightly small and weighs 260 g.

The heart's left atrioventricular valves have mild nodular thickenings along the free edge.

GROSS DIAGNOSIS: By KAH

Excellent body condition and postmortem condition.

Uterus: multiple cysts, single leiomyoma, single presumed polyp

Right stifle: periarticular and intermuscular hemorrhage, peracute

Left kidney: Cyst, cranial pole. multiple <2 mm nephroliths

Kidneys, bilateral: renal atrophy

LABORATORY STUDIES:

TISSUE STATUS:

SHELVED:	False
TRIMMED:	True
FROZEN:	False
ULTRAFROZEN:	True
Tissues Ultrafrozen:	Liver kidney lung feces

SPECIAL REQUESTS: On By

HISTOLOGY: On 7/12/2017 By KAH

1. LIVER, SPLEEN

2. KIDNEY

3. TONGUE, HEART

4. TRACHEA, ESOPHAGUS, LUNG

5. STOMACH, PANCREAS, ILEOCECOCOLIC JXN

6. INTESTINE, URINARY BLADDER, MARROW, ADRENAL

7. CERVIX MASS, CYSTIC UTERINE WALL, POLYPOID MASS

8. UTERINE MASS, UTERINE HORN

9. BRAIN- Cerebrum

10. BRAIN - Cerebellum

11. EYE

MORPHOLOGIC DIAGNOSIS:

1) Kidney: Glomerulonephropathy, membranous, moderate to severe, w/ multifocal glomerulosclerosis, renal pelvis mineralization, and interstitial fibrosis

2) Stomach: Gastritis, lymphoplasmacytic, mild, multifocal, with lymphangiectasia. (Slide 5)

3) Small intestine: Enteritis, lymphoplasmacytic, moderate to severe, diffuse, with increased enterocyte mitotic activity and bacilli in crypt lumens.

4) Cecocolic junction: Typhlocolitis, lymphoplasmacytic, moderate, with focal fibrinonecrotic plug containing mixed bacteria. Short rods predominate.

5) Liver: Hepatic congestion, centrilobular to midzonal, moderate.

6) Uterus: Leiomyoma.

7) Uterus: Fibroadenomas, multiple, sessile and polypoid.

8) Uterus: Fibroadenomatous hyperplasia.

9) Brain, Hippocampus: Vacuolation and gliosis, locally extensive, moderate to marked.

REMARKS: On 7/13/2017 By KAH

Renal lesions in this case are consistent with the clinical history of renal insufficiency and indicate a chronic course of disease. Vacuolar lesions in the brain have been reported in cases of significant renal disease in domestic cats*, and this is a likely cause of this caracal's hippocampal vacuolation. Potentially related, last year caracal Kibaru, an aged male caracal with a history of elevated kidney values and seizures, was found on necropsy to have multifocal vacuolation affecting various locations in the cerebral cortex and hippocampus. That animal also had renal disease. As both cats were aged, the age of cats in the surveillance study was unreported, and

the coincidence of renal disease with advanced years is common in cats, we cannot definitively say that these vacuoles are age-related or even clinically significant.

An etiology could not be determined for the enterocolitis; however, bacilli in intestinal crypts suggest that there may be a dysbiotic or infectious component.

Uterine tumors are common in aged females and are generally benign with little clinical significance.

*Neuropathology of Italian Cats in Feline Spongiform Encephalopathy Surveillance. B. Iulini, C. Cantile, M. T. Mandara, C. Maurella, G. R. Loria, M.Castagnaro, C. Salvadori, C.Porcario, C. Corona, A. Z.Perazzini, A. Maroni, M. Caramelli, C. Casalone. Veterinary Pathology. 2008 vol: 45 (5) pp: 626-633

Holder	Holder	7/13/2017
PROSECTOR	PATHOLOGIST	DATE COMPLETED

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Pathology Module - Final Pathology Report
NATIONAL ZOOLOGICAL PARK

PATH # N2017-0123

Death Date: 6/23/2017
Necropsy Date: 6/23/2017

AILURUS FULGENS FULGENS
Red panda
Name:

Gender: Male

Age: 0Y 0M 6D

Accession No.: 115536

Birth:
17 Jun 2017

Acquired:

Removed:
21 Jun 2017

SEX: Male AGE: 0Y 0M 6D WEIGHT: 102.6 gm STAY:

MANNER OF DEATH: Found Dead
TIME OF DEATH:
DEATH LOCATION: SCBI Red Panda #7
SUBMITTOR: Juan Rodriguez
OWNER/ANIMAL DEPT: DCM

INTERVAL: 48-72 Hours
XRAYED: False
DISPOSITION: INCINERATE
PROSECTOR: Holder

HISTORY AND CLINCICAL OBSERVATIONS:

KEEPER OBSERVATIONS: On 6/23/2017 By JR

Dam: 115234 (first time dam)

Sire: 115442

21 June 2017: Visualized on remote camera, one of two cubs moving, one not moving but view was not clear. Management decision

to monitor and wait for first opportunity to access cubs without jeopardizing maternal care for cubs. Keeper accessed den this

morning while dam was out and found one deceased cub. One cub still alive and BAR. Sex of deceased cub is undetermined.

CLINICIAN OBSERVATIONS: On By

GROSS DESCRIPTION: On 6/23/2017 By KAH

Presented for necropsy is a neonatal, male, 103 g, red panda cub. Postmortem condition is poor, and there are numerous fly eggs in the fur and oral cavity. Body condition is poor with no discernible subcutaneous or intra-abdominal fat stores, poor muscle mass, and an empty GI with no evidence of milk or feces.

The ductus arteriosus is prominent, but due to the size of the animal patency could not be determined.

GROSS DIAGNOSIS: By KAH

Body as a whole: Poor body condition.

Body as a whole: Postmortem autolysis

Great vessels: Persistent ductus arteriosus

LABORATORY STUDIES:

TISSUE STATUS:

SHELVED:	False
TRIMMED:	True
FROZEN:	False
ULTRAFROZEN:	True
Tissues Ultrafrozen:	Liver, lung, kidney

SPECIAL REQUESTS: On By

HISTOLOGY: On 7/12/2017 By KAH

1. LIVER, SPLEEN
2. INTESTINE
3. TONGUE, HEART, TRACHEA
4. GREAT VESSELS
5. LUNG
6. KIDNEY, ADRENAL, GONAD, EYE
7. BRAIN

MORPHOLOGIC DIAGNOSIS:

1) Body as a whole: Autolysis

REMARKS: On 7/13/2017 By KAH

No significant abnormalities are identified, which is common in many neonatal mortality cases; however, autolysis may have obscured diagnostically relevant findings.

As per the gross findings: The lack of GI contents implies that this animal may have been unsuccessful at nursing prior to death. The presence of the ductus arteriosus at this age may be normal.

Holder	Holder	7/13/2017
PROSECTOR	PATHOLOGIST	DATE COMPLETED

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Pathology Module - Final Pathology Report
NATIONAL ZOOLOGICAL PARK

PATH # N2017-0124

Death Date: 6/24/2017
Necropsy Date: 6/24/2017

ICTERUS GALBULA (no subsp)
Northern oriole
Name:

Sex

Gender: Unknown

Accession No.: 216630

Age: 0Y 0M 5D

Birth:
19 Jun 2017

Acquired:

Removed:
24 Jun 2017

SEX: Unknown Sex AGE: 0Y 0M 5D WEIGHT: 0 gm STAY:

MANNER OF DEATH: Found Dead
TIME OF DEATH:
DEATH LOCATION: BH3/4
SUBMITTOR: Jordana Todd
OWNER/ANIMAL DEPT: DOO

INTERVAL: 0-6 hours
XRAYED: False
DISPOSITION: INCINERATE
PROSECTOR: Hope

HISTORY AND CLINCICAL OBSERVATIONS:

KEEPER OBSERVATIONS: On 6/24/2017 By JT

Recently, hatched chick. Found on a high perch in exhibit far from nest. One of two chicks found deceased this morning

CLINICIAN OBSERVATIONS: On By

GROSS DESCRIPTION: On 6/24/2017 By KH

Chick placed directly in formalin by Dr. Katharine Hope.

GROSS DIAGNOSIS: By

LABORATORY STUDIES:

TISSUE STATUS:

SHELVED: False

TRIMMED: True

FROZEN: False

ULTRAFROZEN: False

Tissues
Ultrafrozen:

SPECIAL REQUESTS: On By

HISTOLOGY: On 8/14/2017 By Exemption 6

Umbilicus: The umbilicus has focal serocellular crust formation and heterophilic inflammation associated with bacterial colonization and necrosis of tissue surrounding the infundibulum.

Lung: The interstitium is infiltrated by moderate numbers of granulocytes, and endothelial cells are hypertrophied, blood vessels are congested, and parabronchi are suffused with extravasated blood. Bacterial emboli are present in capillaries.

Wing: Serial sections of the wing identify a bacterial thromboembolus in one of the blood vessels.

Liver: Some of the Kupffer cells are hypertrophied and contain phagocytized cell debris. Mild multifocal lymphoplasmacytic inflammation and hepatocellular necrosis are noted.

The following tissues are histologically within normal limits: musculoskeletal system, central nervous system, ears, eyes, oral and nasal cavities, uropygial gland, alimentary tract, spleen, trachea, air sacs, kidney, and skin.

MORPHOLOGIC DIAGNOSIS:

1) Umbilicus: Omphalophlebitis, necrotizing, with intralesional bacteria

2) Body as a whole: Intravascular septic emboli and thrombi.

3) Liver: Hepatitis, lymphocytic and necrotizing, multifocal, mild

REMARKS: On 8/14/2017 By Exemption 6

The primary problem in this case is the bacterial omphalophlebitis. Subsequent to this process, the bird became septic.

Histopathology and comments:

Exemption 6

Hope	Holder	8/14/2017
PROSECTOR	PATHOLOGIST	DATE COMPLETED

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Pathology Module - Final Pathology Report
NATIONAL ZOOLOGICAL PARK

PATH # N2017-0125

Death Date: 6/24/2017
Necropsy Date: 6/24/2017

ICTERUS GALBULA (no subsp)
Northern oriole
Name:

Sex

Gender: Unknown

Accession No.: 216637

Age: 0Y 0M 3D

Birth:
21 Jun 2017

Acquired:

Removed:
24 Jun 2017

SEX: Unknown Sex AGE: 0Y 0M 3D WEIGHT: 0 gm STAY:

MANNER OF DEATH: Found Dead
TIME OF DEATH:
DEATH LOCATION: BH3/4
SUBMITTOR: JT
OWNER/ANIMAL DEPT:

INTERVAL: 0-6 hours
XRAYED: False
DISPOSITION: ALL IN FORMALIN
PROSECTOR: Hope

HISTORY AND CLINCICAL OBSERVATIONS:

KEEPER OBSERVATIONS: On 6/24/2017 By JT

Recently, hatched chick. Found on ground in exhibit far from nest. One of two chicks found deceased this morning. Some ants on bird when found.

CLINICIAN OBSERVATIONS: On By

GROSS DESCRIPTION: On 6/24/2017 By KH

Chick placed in formalin by Dr. Katharine Hope.

GROSS DIAGNOSIS: By

LABORATORY STUDIES:

TISSUE STATUS:

SHELVED: False

TRIMMED: True

FROZEN: False

ULTRAFROZEN: False

Tissues
Ultrafrozen:

SPECIAL REQUESTS: On By

HISTOLOGY: On 8/14/2017 By Exemption 6

UMBILICUS: The umbilicus is distended with infundibular accumulations of laminated fibrin, necrotic cellular debris, heterophils, and bacteria.

LUNG: The interstitium is infiltrated by low numbers of heterophils, endothelial cells are hypertrophied, and blood vessels are congested.

LIVER: Periportal to random foci of hepatocellular necrosis and plasmacytic inflammation are noted. SKULL: Serial sections of the skull reveal some intraosseous hemorrhage in the flat bones of the rhinotheca region. The following tissues are histologically within normal limits: central nervous system, oral and nasal cavities, ears and eyes, adipose, heart, esophagus, great vessels, proventriculus, ventriculus, ganglia, kidney, and intestine.

MORPHOLOGIC DIAGNOSIS:

1) Body as a whole: Sepsis.

1) Umbilicus: Omphalophlebitis, necrotizing, with intralesional bacteria

3) Facial flat bones: Acute hemorrhage, trauma

REMARKS: On 8/14/2017 By Exemption 6

The primary problem in this case is the bacterial omphalophlebitis. This is one of the more common causes of neonatal avian mortality, and there is also evidence of some trauma in the flat bones of the skull likely due to a fall from the nest. This bird may have been culled by the parents.

Histopathology and comment by:

Exemption 6

Exemption 6

Hope	Holder	8/14/2017
PROSECTOR	PATHOLOGIST	DATE COMPLETED

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Pathology Module - Final Pathology Report
NATIONAL ZOOLOGICAL PARK

PATH # N2017-0126

Death Date: 6/24/2017
Necropsy Date: 6/24/2017

CORYDORAS (unk sp)
Corydoras catfish
Name:

Sex

Gender: Unknown

Accession No.: 500859

Age:

Birth:

Acquired: 15 Sep 2015

31 Dec 2016

SEX: Unknown Sex AGE: ADULT WEIGHT: 0 gm STAY:

MANNER OF DEATH: Found Dead
TIME OF DEATH:
DEATH LOCATION: H8 Amazonia
SUBMITTOR: Wippenbeck
OWNER/ANIMAL DEPT: DOA

INTERVAL: 0-6 hours
XRAYED: False
DISPOSITION: INCINERATE
PROSECTOR: Hope

HISTORY AND CLINCICAL OBSERVATIONS:

KEEPER OBSERVATIONS: On 6/24/2017 By TW

Found dead at am check.

CLINICIAN OBSERVATIONS: On By

GROSS DESCRIPTION: On 6/24/2017 By KH

Carcass placed in formalin by Dr. Katharine Hope.

GROSS DIAGNOSIS: By

LABORATORY STUDIES:

TISSUE STATUS:

SHELVED: False

True

TRIMMED:

FROZEN: False

ULTRAFROZEN: False

Tissues
Ultrafrozen:

SPECIAL REQUESTS: On By

HISTOLOGY: On 8/15/2017 By Exemption 6

HEAD: Serial sections of the head reveal a facial abscess at the level of the olfactory lobe of the brain with associated gas production. The abscess is associated with large numbers of bacteria, and a thromboembolus is at the core of the abscess. Inflammation also extends into the meninges in the olfactory region.

GILL: The gills have marked atrophy.

The following tissues are histologically within normal limits with the exception of autolysis: musculoskeletal system, central nervous system, ears, eyes, oral and nasal cavities, alimentary tract, oral and nasal cavities, alimentary tract, ovary, liver, pituitary, and skin.

MORPHOLOGIC DIAGNOSIS:

1) Facial abscess.

2) Gill: Marked atrophy

REMARKS: On 8/15/2017 By Exemption 6

The primary problem in this case is the facial abscess. This lesion is associated with bacterial thromboembolism, and I suspect the fish was septic. Autolysis is advanced, and some subtle lesions may have been masked by the autolytic event. The bill atrophy is likely due to hypoperfusion rather than a primary problem with water quality. This fish was in good nutritional status and was a female.

Histology and comments by:

Exemption 6

Hope	Holder	8/15/2017
PROSECTOR	PATHOLOGIST	DATE COMPLETED

Printed on: 8/16/2017 12:23:34 PM CARES-MED v2.119

Pathology Module - Final Pathology Report
NATIONAL ZOOLOGICAL PARK

PATH # N2017-0127

Death Date: 6/26/2017
Necropsy Date: 6/26/2017

ACINONYX JUBATUS JUBATUS
Southern African cheetah
Name: Malakai

Gender: Male
Age: 11Y 0M 6D
Chip: 00-0697-d9c1

Accession No.: 115187
Birth: 20 Jun 2006
Acquired: 13 May 2015
Removed: 26 Jun 2017

On loan from WHITE OAK PLANTATION, YULEE

SEX: Male AGE: 11Y 0M 6D WEIGHT: 43 kg STAY: > 30 Days

MANNER OF DEATH: Euthanasia
TIME OF DEATH: 10:0A
DEATH LOCATION: SCBI Vet Hospital
SUBMITTOR: Priscilla Joyner
OWNER/ANIMAL DEPT: DCM

INTERVAL: 0-6 hours
XRAYED: False
DISPOSITION: INCINERATE
PROSECTOR: Andrew Cartoceti

HISTORY AND CLINCICAL OBSERVATIONS:

KEEPER OBSERVATIONS: On 6/26/2017 By AC

Cheetah has had a marked decrease in appetite and food consumption over the last 4-6 weeks. Animal has history of liver and kidney disease, as well as a heart murmur. Body condition loss by visual assessment of keeper/care staff. Weight loss has not been congruent with decreased food intake. Abdomen appears distended and staff suspect enlarged liver/ascites.

CLINICIAN OBSERVATIONS: On 6/26/2017 By PJ

Geriatric male cheetah with chronic history of Hepatopathy, ascites (June 2016), pica, distended abdomen and PUPD. Clinical pathology confirmed liver disease. Managed with SAM-E maropitant, epakitin. For the last 5 weeks, this cheetah has had severe inappatence inappatence and loss of condition but no significant weight loss.
Due to deteriorating quality of life, euthanasia was planned.

Induced anesthesia with medetomidine, midazolam, butorphanol and ketamine. Placed 18 g IV catheter in right cephalic vein. Administered 9 mls Euthasol + 9 mls sterile water IV via catheter.

On exam, animal was thin, BCS 3/9. Distended cranial abdomen with fluid thrill. Cranial abdominal organs palpate enlarged. Dental calculus. Alopecic patch with skin thickening over shoulder blades. Long nails. Remainder of exam nsf.

GROSS DESCRIPTION: On 6/27/2017 By ANC

A 43.0 kilogram, adult, intact male, South African cheetah (000697D9C1) is necropsied on 26 June 2017 following euthanasia for quality of life concerns. The carcass is in good postmortem condition and fair body condition with adequate subcutaneous and abundant intra-abdominal/perivisceral adipose stores, but some generalized muscle atrophy making the several bony prominences (spine of the scapula, dorsal vertebral processes, pelvis) more obvious. The nails are mildly to moderately overgrown. The abdominal cavity contains mildly increased amounts of watery, pale yellow, clear fluid. The liver is markedly enlarged (1.535 kg, 3.6% of body weight), with rounded margins, a finely nodular capsular surface with linear white streaking (fibrosis) and innumerable miliary white nodules throughout the parenchyma of all lobes. The gallbladder is engorged and the bile duct is slightly tortuous but patent. The spleen is mildly enlarged and meaty with dozens of soft, pale yellow nodules (up to 1 cm in diameter) scattered throughout the parenchyma. Cut sections of spleen float low in formalin. The stomach contains scant amounts of mucoid orange brown ingesta and the mucosa of the fundus has few stellate foci of depression and dark red discoloration. The small intestine contains scant pasty orange ingesta and the colon contains formed feces. There is mild to moderate dental calculus, especially along the base of the premolar and molar teeth. The eyes, brain, oral cavity, tongue, lymph nodes (mandibular and tracheobronchial), thyroid glands, trachea, esophagus, lungs, heart, diaphragm, adrenal glands, kidneys, urinary bladder, testes, joints (glenohumeral, humeroradial/ulnar, coxofemoral and femorotibial) and sciatic nerve are grossly unremarkable.

GROSS DIAGNOSIS: By ANC

Liver: Severe diffuse hepatopathy with miliary white nodules and capsular fibrosis
Spleen: Multiple masses (presumptive myelolipomas)
Stomach: Mild multifocal gastritis/mucosal ulceration
Teeth: Moderate dental calculus
Body as a whole: Fair body condition with adequate adipose stores and mild generalized muscle atrophy

LABORATORY STUDIES:

TISSUE STATUS:

SHELVED:	False
TRIMMED:	True

FROZEN: False

ULTRAFROZEN: True

Tissues Ultrafrozen: Liver (2), spleen, kidney, lung, stomach; blood at 4 C.

SPECIAL REQUESTS: On By

HISTOLOGY: On 7/24/2017 By ANC

1. LUNG
2. LUNG; TRACHEOBRONCHIAL LYMPH NODE; TESTIS
3. LIVER; GALLBLADDER
4. THYROID; ADRENAL; MANDIBULAR LYMPH NODE
5. KIDNEY
6. KIDNEY; SPLEEN
7. HEART, LEFT and RIGHT PAPILLARY MUSCLES, INTERVENTRICULAR SEPTUM
8. STOMACH
9. SMALL INTESTINE; PANCREAS
10. CECUM; COLON; CECAL LYMPH NODE
11. URINARY BLADDER; TRACHEA; ESOPHAGUS; TESTIS
12. TONGUE; DIAPHRAGM; SKIN; SCIATIC NERVE
13. BRAIN, CEREBRUM, PITUITARY GLAND
14. BRAIN, THALAMUS
15. BRAIN, THALAMUS
16. BRAIN, CEREBRUM, HIPPOCAMPUS
17. BRAIN, MIDBRAIN
18. BRAIN, CEREBELLUM, BRAINSTEM
19. BRAIN, BRAINSTEM
20. EYE

MORPHOLOGIC DIAGNOSIS:

1) (A) Liver: Severe, chronic, diffuse centrilobular hepatocyte atrophy and loss with central vein intimal and perivenular fibrosis,
1) (B) bridging central-central fibrosis, hepatocellular regeneration and collateral vein formation (veno-occlusive disease with cirrhosis)
2) Spleen: Multiple myelolipomas
3) (A) Stomach: Moderate, diffuse, chronic, lymphoplasmacytic gastritis with mucosal spiral bacteria (consistent with Helicobacter sp.),
3) (B) proprial fibrosis and gland nesting
4) Kidney: Mild, multifocal glomerulosclerosis and periglomerular/tubular fibrosis
5) Liver: Moderate, multifocal, vacuolar hepatopathy (glycogen type)
6) Lymph node, cecocolic: Sinus erythrocytosis and erythrophagocytosis
7) Lymph node, tracheobronchial: Sinus eosinophilia

REMARKS: On 7/24/2017 By ANC

7/24/17: Histology revealed advanced veno-occlusive disease as the cause of the grossly cirrhotic liver and the clinically reported ascites. Veno-occlusive disease is considered the most important factor in this cheetah's decline. Splenic myelolipomas and gastritis associated with spiral bacteria (presumed Helicobacter) were also confirmed. Based on the criteria provided in Munson 1993, veno-occlusive disease is grade 3, glomerulosclerosis is grade 1 and gastritis is grade 2. The cecocolic lymph node appears to be draining a region of recent hemorrhage, although hemorrhage was not appreciated grossly in the distal GI tract.

Munson L. 1993. Diseases of captive cheetahs (Acinonyx jubatus): results of the Cheetah Council Pathology Survey, 1989-1992. Zoo Biology 12(1):105-24.

Andrew Cartoceti	Andrew Cartoceti	7/24/2017
PROSECTOR	PATHOLOGIST	DATE COMPLETED

Pathology Module - Final Pathology Report
NATIONAL ZOOLOGICAL PARK

PATH # N2017-0128

Death Date: 6/24/2017
Necropsy Date: 6/24/2017

ICTERUS GALBULA (no subsp)
Northern oriole
Name:

Sex

Gender: Unknown

Accession No.: 216632

Age: 0Y 0M 4D

Birth:
20 Jun 2017

Acquired:

Removed:
24 Jun 2017

SEX: Unknown Sex AGE: 0Y 0M 4D WEIGHT: 0 gm STAY:

MANNER OF DEATH: Found Dead
TIME OF DEATH:
DEATH LOCATION: BH3/4
SUBMITTOR: Jordana Todd
OWNER/ANIMAL DEPT: DOO

INTERVAL: 6-24 hours
XRAYED: False
DISPOSITION: ALL IN FORMALIN
PROSECTOR: Holder

HISTORY AND CLINCICAL OBSERVATIONS:

KEEPER OBSERVATIONS: On By

Recently, hatched chick. Female was removing deceased chick from nest around 1:30 pm

CLINICIAN OBSERVATIONS: On By

GROSS DESCRIPTION: On 6/26/2017 By KAH

Abdomen incised, whole carcass placed in formalin.

GROSS DIAGNOSIS: By

LABORATORY STUDIES:

TISSUE STATUS:

SHELVED: False

True

TRIMMED:

FROZEN: False

ULTRAFROZEN: False

Tissues
Ultrafrozen:

SPECIAL REQUESTS: On By

HISTOLOGY: On 8/15/2017 By Exemption 6

LIVER: Moderate, periportal to random infiltrates of mixed mononuclear and granulocytic cells are noted, sometimes accompanied by mild hemorrhage and necrosis.

SPLEEN: Lymphoid cellularity is markedly depleted. LUNG: Some aspirated water is present within the parabronchi associated with overgrowth of bacteria. The surrounding parenchyma is atelectatic and has a mild infiltrate of granulocytes.

UMBILICUS: The umbilicus has severe heterophilic inflammation, fibrin deposition, and bacterial overgrowth.

ADIPOSE: Adipose stores are atrophic.

The following tissues are histologically within normal limits: musculoskeletal system, central nervous system, ears, eyes, oral and nasal cavities, alimentary tract, trachea, kidney, gallbladder, great vessels, cloaca, bursa, heart, thyroid, parathyroid, thymus, yolk sac, pancreas, air sacs, and skin.

MORPHOLOGIC DIAGNOSIS:

1) Umbilicus: Omphalophlebitis, necrosuppurative, with intralesional bacteria

2) Liver: Acute hepatitis, mild.

3) Spleen: Lymphoid depletion

4) Lung: Acute aspiration.

REMARKS: On 8/15/2017 By Exemption 6

The primary problem in this case is the bacterial omphalophlebitis with subsequent sepsis and aspiration. Bacterial omphalophlebitis is perhaps the most common cause of avian mortality within this age group. I am unable to determine gender for this bird from the examined sections.

Histopathology and comments by:

Exemption 6

Holder	Holder	8/15/2017
PROSECTOR	PATHOLOGIST	DATE COMPLETED

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Pathology Module - Final Pathology Report
NATIONAL ZOOLOGICAL PARK

PATH # N2017-0129

Death Date: 6/27/2017
Necropsy Date: 6/27/2017

MACROSCELIDES PROBOSCIDEUS
Short-eared elephant shrew
Name: Sam

Gender: Male
Age: 2Y 1M 5D

Accession No.: 115198
Birth: 22 May 2015
Acquired: 22 May 2015
Removed: 27 Jun 2017

On loan from PHILADELPHIA ZOOLOGICAL GARDEN, PHILADELPHIA

SEX: Male	AGE: 2Y 1M 5D	WEIGHT: 35.9 gm	STAY: > 30 Days
MANNER OF DEATH: Died		INTERVAL: 0-6 hours	
TIME OF DEATH: 08:30		XRAYED: False	
DEATH LOCATION: SMH Aq2B		DISPOSITION: Formalin	
SUBMITTOR: KK		PROSECTOR: ANC	
OWNER/ANIMAL DEPT: DOM - SMH			

HISTORY AND CLINCICAL OBSERVATIONS:

KEEPER OBSERVATIONS: On 6/27/2017 By KK

Housed on sand solo in Aquarium 2B at Small Mammal House. During routine AM cleaning when shifting between sides of aquarium, keeper accidentally closed shift door on top of shrew when shrew darted unexpectedly under door. Shift door is corrugated board.

CLINICIAN OBSERVATIONS: On By

GROSS DESCRIPTION: On 6/27/2017 By ANC

A 35.9 gram, adult, male short-eared elephant shrew is necropsied on 27 June 2017 following death due to accidental trauma. The carcass is in good postmortem condition and good body condition with well fleshed musculature and modest subcutaneous and intra-abdominal adipose stores. The right external ear canal is filled with granular, sticky, dark to light grey material (sebaceous exudate) and a small amount of this material lines the inside of the right tympanic bulla. Ribs 6 to 9 on the left and rib 9 on the right are fractured approximately 2-3 mm distal to the head of the ribs and there is acute hemorrhage into the intercostal muscles and parietal pleura. The stomach is filled with granular white to green ingesta and the colon contains formed feces. The eyes, brain, trachea, esophagus, lungs, heart, liver, kidney, adrenal glands, spleen, testes and urinary bladder are grossly unremarkable.

GROSS DIAGNOSIS: By ANC

Ribs: Multiple, acute, transverse, non-displaced, closed fractures with acute intramuscular hemorrhage
Ears (right external canal and tympanic bulla): Excess sebaceous debris
Body as a whole: Good body condition

LABORATORY STUDIES:

TISSUE STATUS:

SHELVED:	False
TRIMMED:	True
FROZEN:	False
ULTRAFROZEN:	True

Tissues Ultrafrozen: Liver (2), kidney

SPECIAL REQUESTS: On By

HISTOLOGY: On 7/21/2017 By ANC

1. BRAIN
2. HEART; LUNG; LIVER; GALLBLADDER; KIDNEY; PANCREAS;
3. TESTIS; URINARY BLADDER; ADRENAL; SMALL INTESTINE; PANCREAS; LARGE INTESTINE; TRACHEA; ESOPHAGUS
4. STOMACH; TONGUE; HINDLIMB SKELETAL MUSCLE
5. HEAD, NASAL CAVITY, EYES
6. SKULL, EARS; RIGHT TYMPANIC BULLA; HINDLIMB SKELETAL MUSCLE

MORPHOLOGIC DIAGNOSIS:

1) Tympanic cavity, right: Moderate, diffuse, chronic, suppurative otitis media with intraluminal budding yeast, fungal hyphae and keratin debris

REMARKS: On 7/21/2017 By ANC

7/21/17: Histology revealed fungal infection of the right middle as the cause of the excess exudate/debris that was appreciated grossly. No other concurrent disease was identified in this shrew, that died from acute traumatic injuries.

ANC	Andrew Cartoceti	7/21/2017
PROSECTOR	PATHOLOGIST	DATE COMPLETED

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Pathology Module - Final Pathology Report
NATIONAL ZOOLOGICAL PARK

PATH # N2017-0130

Death Date: 6/24/2017
Necropsy Date: 6/24/2017

CARDUELIS CUCULLATA
Red siskin
Name:

Gender: Unknown

Sex

Accession No.: 216636

Age: 0Y 0M 2D

Birth:
22 Jun 2017

Acquired:

Removed:
24 Jun 2017

SEX: Unknown Sex AGE: 0Y 0M 2D WEIGHT: 0 gm STAY:

MANNER OF DEATH: Found Dead
TIME OF DEATH:
DEATH LOCATION:
SUBMITTOR:
OWNER/ANIMAL DEPT: DCO

INTERVAL: 0-6 hours
XRAYED: False
DISPOSITION: INCINERATE
PROSECTOR: Joyner

HISTORY AND CLINCICAL OBSERVATIONS:

KEEPER OBSERVATIONS: On By

CLINICIAN OBSERVATIONS: On 6/24/2017 By PJ

This 2 day old siskin was the last to hatch from a clutch of 4. The 2 oldest chicks hatched 2 days earlier on 6/20 and the third hatched on 6/21. The bird was found dead in the nest beneath its 3 siblings and was without any obvious trauma. It is likely that this much smaller bird was unable to compete for food and was not yet strong enough to push its way out from beneath its older siblings. The 3 remaining nestling's appeared healthy and responsive.

The carcass was placed in a plastic bag and refrigerated at ~0645 on 6/24; it was later (~1100) placed in formalin.

GROSS DESCRIPTION: On 6/28/2017 By KAH

Carcass placed directly in formalin by clinician. No necropsy.

GROSS DIAGNOSIS: By

LABORATORY STUDIES:

TISSUE STATUS:

SHELVED:	False
TRIMMED:	True
FROZEN:	False
ULTRAFROZEN:	False

Tissues
Ultrafrozen:

SPECIAL REQUESTS: On By

HISTOLOGY: On 8/15/2017 By [redacted]

YOLK SAC: The connective tissues around the yolk sac are edematous and infiltrated by moderate numbers of heterophils and lymphocytes.

LUNG: Diffusely, the interstitium is infiltrated by low numbers of mononuclear and granulocytic cells, the pulmonary parenchyma is congested, atelectatic, and markedly edematous.

ADIPOSE: Adipose stores are atrophic. EYE: Both eyes have anterior uveal infiltrates of lymphocytes.

The following tissues are histologically within normal limits: musculoskeletal system, central nervous system, ears, oral and nasal cavities, proventriculus, ventriculus, ganglia, crop, intestine, kidney, cloaca, ductus deferens, and skin.

MORPHOLOGIC DIAGNOSIS:

1) Abdominal body wall: Pericloacal cellulitis (probable omphalophlebitis)

2) Lung: Acute interstitial pneumonia.

3) Eyes: Acute bilateral mild anterior uveitis.

4) Body as a whole: Atrophy of fat.

REMARKS: On 8/15/2017 By Exemption 6

Histologic findings are most consistent with a combination of inanition and bacterial omphalophlebitis, although the umbilicus is not in the plane of section. The inflammatory changes in the connective tissues adjacent to the yolk sac are a characteristic feature of omphalophlebitis. Although the gonad was not identified, the ductus deferens was identified in the cloacal sections. This bird was a male.

Histopathology and comment by:

Exemption 6

Joyner	Holder	8/15/2017
PROSECTOR	PATHOLOGIST	DATE COMPLETED

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Pathology Module - Final Pathology Report
NATIONAL ZOOLOGICAL PARK

PATH # N2017-0131

Death Date: 6/27/2017
Necropsy Date: 6/27/2017

LANIUS LUDOVICIANUS MIGRANS
Loggerhead shrike
Name:

Gender: Unknown Sex
Age: 0Y 1M 12D

Accession No.: 216599
Birth: 15 May 2017
Acquired: 15 May 2017
Removed: 27 Jun 2017

SEX: Unknown Sex AGE: 0Y 1M 12D WEIGHT: 50 gm STAY: > 30 Days

MANNER OF DEATH: Found Dead
TIME OF DEATH: 13:30
DEATH LOCATION: SCBI SAF S-P
SUBMITTOR: C.Crowe
OWNER/ANIMAL DEPT: DCO

INTERVAL: 0-6 hours
XRAYED: False
DISPOSITION: REFRIGERATOR
PROSECTOR: PJ

HISTORY AND CLINCICAL OBSERVATIONS:

KEEPER OBSERVATIONS: On 6/27/2017 By CC

Housed in outdoor pen with 0.0.5 conspecific siblings and 1.1 adults. No abnormal behaviors , recent health problems or intraspecies aggression observed.

Found dead on ground at 1330, lying on back with wings spread open about a foot away from front of cage.

On 6/26/17 this bird and it's siblings were handled for first West Nile Virus vaccination, RX of Moxidectin PO, and leg banding.

On 6/26/17 this bird had a live weight of 48.0 grams.

CLINICIAN OBSERVATIONS: On 6/27/2017 By PJ

Juvenile shrike in family group of 6. On June 26th, manually restrained for examination. Wt=48 g. BCS 4/9. No clinical abnormalities noted. Administered Moxidectin orally and WNV killed vaccine 0.5 mls SC split in 2 injection sites over pectoral muscling.

June 27 PM found dead in enclosure.

GROSS DESCRIPTION: On 6/27/2017 By PJ

A 50 gram, juvenile, male loggerhead shrike is necropsied on 27 June 2017 following being found dead. The carcass in good post mortem condition, in rigor mortis. Body condition score is estimated at 4/9, with a prominent keel. A single 1 mm diameter red spot is present in the muscling over the right and left pectoral muscle (consistent with injections given ante mortem). There are no other external abnormalities. The air sacs are transparent. The intestines are empty, and otherwise appear grossly normal. There are vestigial ceca. Small amount of urates are present in the cloaca. Attempts to obtain blood from heart using needle and syringe were unsuccessful. The lungs are pink and float in formalin. Testes are present. The heart, lung, kidneys, spleen and liver appear grossly normal.

GROSS DIAGNOSIS: By ANC

Body as a whole: Fair body condition

LABORATORY STUDIES:

TISSUE STATUS:

SHELVED:	False
TRIMMED:	True
FROZEN:	False
ULTRAFROZEN:	True

Tissues Ultrafrozen: Lung, liver, small intestine

SPECIAL REQUESTS On By

HISTOLOGY: On 7/20/2017 By ANC

1. BRAIN
2. BRAIN; HEART; LUNGS
3. LIVER; KIDNEY; SPLEEN; SKELETAL MUSCLE
4. TRACHEA; ESOPHAGUS; STOMACH; SMALL INTESTINE; LARGE INTESTINE
5. SKULL; EYES; NASAL CAVITY

MORPHOLOGIC DIAGNOSIS:

1) Liver: Mild, multifocal, chronic, lymphocytic portal hepatitis
2) Body as a whole: Replete adipose

REMARKS: On 7/20/2017 By ANC

7/20/17: A cause for this shrike's sudden death was not determined as no significant gross or histologic lesions were identified. Covert trauma or an idiosyncratic drug reaction remain possible.

PJ	Andrew Cartoceti	7/20/2017
PROSECTOR	PATHOLOGIST	DATE COMPLETED

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Pathology Module - Final Pathology Report
NATIONAL ZOOLOGICAL PARK

PATH # N2017-0132

Death Date: 6/29/2017
Necropsy Date: 6/29/2017

PHYSIGNATHUS COCINCINUS
Asian water dragon
Name:

Gender: Unknown Sex
Age: 0Y 0M 0D

Accession No.: 307669
Birth: 29 Jun 2017
Acquired:

SEX: Unknown Sex AGE: 0Y 0M 0D WEIGHT: 3.2 gm STAY: <= 30 Days

MANNER OF DEATH: Found Dead
TIME OF DEATH: 07:30A
DEATH LOCATION: Incubator
SUBMITTOR: Lauren Augustine
OWNER/ANIMAL DEPT: DOH

INTERVAL: 0-6 hours
XRAYED: False
DISPOSITION: Formalin
PROSECTOR: Andrew Cartoceti

HISTORY AND CLINCICAL OBSERVATIONS:

KEEPER OBSERVATIONS: On 6/29/2017 By LA

Pipped on 6/28/2017
DOA on 6/29/2017. Significant amount of yolk left and opening on ventral surface.

CLINICIAN OBSERVATIONS: On By

GROSS DESCRIPTION: On 6/29/2017 By ANC

A 3.2 gram, unknown sex, Asian water dragon hatchling along with a 1.2 gram shell are necropsied on 29 June 2017 following death during hatching. The shell is labelled "L" on its exterior and a ~1 to 1.5 cm diameter portion of unresorbed yolk sac is adhered to the inside of the shell. The lizard has a nose to tail tip length of 12.5 cm. There is an open ventral midline umbilicus in the lizard through which a short stalk of blood vessels project. Fat bodies are visible in the caudal neck and caudal coelom. The heart, liver and small intestines are grossly unremarkable. The viscera are fixed in situ to aid in histologic processing.

GROSS DIAGNOSIS: By ANC

Unresorbed yolk sac
Body as a whole: Good body condition with adequate fat bodies

LABORATORY STUDIES:

TISSUE STATUS:

SHELVED:	False
TRIMMED:	True
FROZEN:	False
ULTRAFROZEN:	True

Tissues Ultrafrozen: Yolk

SPECIAL REQUESTS: On By

HISTOLOGY: On 7/24/2017 By ANC

1. BRAIN; SPINAL CORD; EYES; NASAL CAVITY; HEART; LUNG; LIVER; TRACHEA; ESOPHAGUS; STOMACH
2. SPINAL CORD; LUNG; LIVER; FAT BODY; KIDNEY; INTESTINE; PANCREAS
3. YOLK SAC; SHELL

MORPHOLOGIC DIAGNOSIS:

1) Shell and yolk sac: Abundant fungal hyphae
2) Skeletal muscle, head, epaxial, hindlimb: Multifocal to regionally extensive myofiber mineralization (presumptive postmortem artifact)

REMARKS: On 7/24/2017 By ANC

7/24/17: Histology revealed abundant fungal hyphae colonizing the shell and superficial yolk sac of this hatching water dragon. Although there was no accompanying inflammatory response, this likely represents a clinically significant antemortem infection as environmental fungi are slow to grow on tissues after death. Infection is considered the cause of delayed yolk sac resorption and death during hatching. Fungal morphology is suggestive of Aspergillus sp. Soft tissue mineralization is likely a postmortem occurrence, however if mineralization had occurred antemortem it could have affected this lizard's in ovo mobility and ability to properly hatch. The most likely etiologies of metastatic mineralization are maternal nutritional imbalances and improper incubation environments.

Andrew Cartoceti	Andrew Cartoceti	7/24/2017
PROSECTOR	PATHOLOGIST	DATE COMPLETED

Printed on: 7/24/2017 10:00:47 AM CARES-MED v2.119

Pathology Module - Final Pathology Report
NATIONAL ZOOLOGICAL PARK

PATH # N2017-0133

Death Date: 6/29/2017
Necropsy Date: 6/29/2017

MUSTELA NIGRIPES
Black-footed ferret
Name:

Gender: Unknown Sex
Age: 0Y 0M 7D

Accession No.: 115565
Birth: 22 Jun 2017
Acquired: 22 Jun 2017
Removed: 29 Jun 2017

SEX: Unknown Sex AGE: 0Y 0M 7D WEIGHT: 0 gm STAY: <= 30 Days

MANNER OF DEATH: Euthanasia
TIME OF DEATH: 16:45
DEATH LOCATION: Vet hospital, SCBI
SUBMITTOR: PJ
OWNER/ANIMAL DEPT: DCM

INTERVAL: 0-6 hours
XRAYED: False
DISPOSITION: Formalin
PROSECTOR: PJ

HISTORY AND CLINCICAL OBSERVATIONS:

KEEPER OBSERVATIONS: On By

CLINICIAN OBSERVATIONS: On 6/29/2017 By PJ

Born as one of 4 kits to dam 115103. Dam had 1 litter earlier in year, all kits died of bacterial infection. E coli was isolated from vaginal culture of dam and one deceased kit from previous litter. Dam was treated with enrofloxacin and repeat culture was negative.

Kit Presented 6/29/17 - ventral abdominal erythema and vesicles/pustules, weak, poorly responsive and underweight. 2 other kits affected with large coalescing vesicles on ventral abdomen. Culture and cytology pending. This kit declined throughout day and was in agonal breathing at PM check. Euthanized via chamber induction with isoflurane and KCl injection intraperitoneal.
Confirmed cardiorespiratory arrest.

GROSS DESCRIPTION: On 7/14/2017 By ANC

A ferret kit is received whole in formalin. The ventral midline is incised to expose the abdominal organs.

GROSS DIAGNOSIS: By ANC

No gross lesions identified (cursory external exam only).

LABORATORY STUDIES:

TISSUE STATUS:

SHELVED:	False
TRIMMED:	True
FROZEN:	False
ULTRAFROZEN:	False

Tissues Ultrafrozen:

SPECIAL REQUESTS: On By

HISTOLOGY: On 7/21/2017 By ANC

1. HEART; LUNG; LIVER; GALLBLADDER; SPLEEN; KIDNEY; ADRENAL; TONGUE
2. TRACHEA; ESOPHAGUS; THYMUS; STOMACH; DUODENUM; PANCREAS; JEJUNUM; LARGE INTESTINE; URINARY BLADDER
3. SKIN, VENTRUM
4. HEAD, BRAIN

MORPHOLOGIC DIAGNOSIS:

1) Nasal cavity, nasolacrimal duct, conjunctiva: Moderate, acute, necrosuppurative rhinitis, dochitis and conjunctivitis with rare bacteria
2) Liver: Mild, multifocal, suppurative hepatitis with intralesional bacteria
3) Lung: Diffuse alveolar edema

REMARKS: On 7/21/2017 By ANC

7/21/17: The histologic findings are consistent with necrotoxigenic E. coli infection, which has been confirmed via cultures of other ferret kits with similar lesions. Vesicles/pustules were not appreciated on the ventrum either grossly or histologically; however, these are suspected to be due to suppurative adenitis, which was diagnosed in another kit with a similar history and cause of death.

PJ	Andrew Cartoceti	7/21/2017
PROSECTOR	PATHOLOGIST	DATE COMPLETED

Printed on: 7/21/2017 2:49:14 PM CARES-MED v2.119

Pathology Module - Final Pathology Report
NATIONAL ZOOLOGICAL PARK

PATH # N2017-0134

Death Date: 7/1/2017
Necropsy Date: 7/1/2017

ODONTODACTYLUS SCYLLARUS
Peacock mantis shrimp
Name:

Gender: Unknown Sex
Age:

Accession No.: 601435
Birth:
Acquired: 15 Sep 2015

SEX: Unknown Sex AGE: ADULT WEIGHT: 47.9 gm STAY: > 30 Days

MANNER OF DEATH: Found Dead
TIME OF DEATH: 07:45A
DEATH LOCATION: CL5
SUBMITTOR: Hilary Colton
OWNER/ANIMAL DEPT: DOA

INTERVAL: 0-6 hours
XRAYED: False
DISPOSITION: Formalin
PROSECTOR: Andrew Cartoceti

HISTORY AND CLINCICAL OBSERVATIONS:

KEEPER OBSERVATIONS: On 7/1/2017 By HC

0.0.1 Peacock mantis shrimp found dead on exhibit. At time of discovery, animal was out of normal hide space exhibiting rigidity of appendages and dulled shell appearance. Keepers attempted to stimulate reaction to confirm death, before removing animal from exhibit to go to Pathology.

CLINICIAN OBSERVATIONS: On By

GROSS DESCRIPTION: On 7/3/2017 By ANC

A 47.9 gram, adult, unknown sex, peacock mantis shrimp is necropsied on 3 July 2017 following being found dead and placed in formalin. The shrimp has an eye to tail tip length of 13.5 cm. Within the cuticle, there are multiple areas of dark red-brown discoloration that are either slightly depressed or irregularly raised, most notably in the following locations: a 0.2 x 0.1 cm focus on the ventral aspect of the base of the lateral, left, 2nd antenna; a <0.1 cm diameter focus on the cranial aspect of the carpus of the left raptorial appendage; a 0.1 cm diameter focus on the lateral aspect of the base of the merus of the right raptorial appendage; a 0.1 cm diameter focus on the dorsal left lateral aspect of the 2nd abdominal segment; a 0.2 x 0.1 cm diameter focus in the right dorsolateral region of the 4th abdominal segment with darkening of the surrounding cuticle, a 1.3 cm long segment along the dorsocaudal margin of the 4th abdominal segment; a 0.4 x 0.2 cm, multinodular focus at the joint of the right uropod; and a 0.5 cm long segment along the caudal margin of the left lateral uropod pair. There are dozens of <0.1 cm diameter, pale red foci of discoloration in the dorsal and ventral surfaces of the telson. The internal viscera are not assessed as the carcass is fixed whole in formalin.

GROSS DIAGNOSIS: By ANC

Cuticle (antenna, raptorial appendages, abdominal segments, uropod, telson): Mild, multifocal, erosive and proliferative dermatitis/shell disease (presumptive)

LABORATORY STUDIES:

TISSUE STATUS:

SHELVED:	False
TRIMMED:	True
FROZEN:	False
ULTRAFROZEN:	False

Tissues Ultrafrozen:

SPECIAL REQUESTS On By

HISTOLOGY: On 7/28/2017 By ANC

1. UROPOD; ABDOMINAL SEGMENTS
2. TELSON; UROPOD
3. MOUTH; MIDGUT; HEPATOPANCREAS; TESTES
4. RAPTORIAL APPENDAGES
5. HEAD; EYE
6. ABDOMEN

SPECIAL STAINS:
1. Brown & Hopps: Bacteria (primarily Gram-negative rods) are present throughout inflamed exoskeleton and dermis, and also more diffusely in the perimysium of deeper muscular layers throughout the section.

MORPHOLOGIC DIAGNOSIS:

1) Shell, appendages, abdomen, telson, uropods: Moderate, multifocal, chronic dermatitis with mixed

bacteria, melanin granulomas and ulceration
2) Coelom: Moderate, focal, chronic coelomitis with melanin granuloma

REMARKS: On 7/28/2017 By ANC

7/28/17: Histology confirmed bacterial infection of the exoskeleton as the cause of the shell lesions with some extension into the deeper parts of the body cavity. Special stain to further characterize the infecting bacteria is pending. Although infection is the proximate cause of death, it is likely secondary to other environmental stressors. Concurrent disease was not identified in the skeletal muscle, digestive tract, neurologic tract, gonads, eyes or appendages. This shrimp is a male.

8/23/17 (ADDENDUM): Bacteria are predominantly Gram-negative rods, which are the more common environmental bacteria found in water. The presence of bacteria diffusely in deeper sections and not simply confined to inflammed exoskeleton suggests either sepsis or postmortem bacterial proliferation.

Andrew Cartoceti	Andrew Cartoceti	7/28/2017
PROSECTOR	PATHOLOGIST	DATE COMPLETED

Printed on: 8/25/2017 9:53:40 AM CARES-MED v2.119

Pathology Module - Final Pathology Report
NATIONAL ZOOLOGICAL PARK

PATH # N2017-0135

Death Date: 7/1/2017
Necropsy Date: 7/1/2017

AILURUS FULGENS FULGENS	Gender: Female	Accession No.: 114646
Red panda	Age: 9Y 0M 0D	Birth: 01 Jul 2008
Name: Regan	Chip: 00-068A-D427	Acquired: 16 Dec 2010
		Removed: 01 Jul 2017

SEX: Female	AGE: 9Y 0M 0D	WEIGHT: 0 gm	STAY: > 30 Days
MANNER OF DEATH:	Found Dead	INTERVAL:	6-24 hours
TIME OF DEATH:	07:30A	XRAYED:	True
DEATH LOCATION:	Holding	DISPOSITION:	INCINERATE
SUBMITTOR:	Helmick	PROSECTOR:	Andrew Cartoceti
OWNER/ANIMAL DEPT:	DCM		

HISTORY AND CLINCICAL OBSERVATIONS:

KEEPER OBSERVATIONS: On By

CLINICIAN OBSERVATIONS: On 7/1/2017 By kh

History: Chronic intermittent history of hypokalemia/collapse, intermittent soft stool production. Found dead at AM check today, visually assessed as normal yesterday. Manager review of overnight film footage reports patient appeared uncomfortable around 430AM, expired 730AM.

Radiographs/thorax and abdomen, lateral images: diaphragm appears protruded into thoracic cavity but intact, stomach and intestines contain an abundant to moderate amount of gas, gastric shadow pattern appears enlarged and may overlap with liver/spleen. Findings may suggest gastric distention, superimposition with other organs (liver, spleen) or postmortem changes (microbial fermentation/gas production). Interscapular transponder. No other overt radiographic abnomralities observed. Lateral radiograph image to pathologist with report.

GROSS DESCRIPTION: On 7/3/2017 By ANC

A 9 year old, adult, female red panda (00068AD427) is necropsied on 01 July 2017 after being found dead. The carcass is in good postmortem condition and good body condition with well-fleshed musculature and adequate subcutaneous and intra-abdominal adipose stores. The fur of the perineum has mild to moderate brown fecal staining. At one end of the spleen, there is a 1 cm diameter region of parenchyma that is subtly depressed and dark red. Within the renal parenchyma at the corticomedullary junction, there are few cysts up to 0.4 cm in diameter filled with clear, yellow, watery fluid. The mucosal surface of the entire esophagus is subtly thickened and irregularly corrugated. The stomach is markedly dilated (comprising approximately 40% of the volume of the abdominal cavity) and is filled with ~1 liter of clear, watery fluid mixed with flocculent, soft, pale brown ingesta (presumptive leafeater biscuits), two grapes and leaf debris. The wall in the distal (pyloric) one third of the stomach is slightly thickened (up to 3 mm thick). The small intestine contains watery, green-brown ingesta and the colon contains scant, unformed, green-brown feces. The eyes, brain, tongue, larynx, trachea, thyroid glands, lymph nodes, heart, lungs, diaphragm, liver, gallbladder, ovaries, uterus and urinary bladder are grossly unremarkable.

GROSS DIAGNOSIS: By ANC

Stomach: Marked dilation with watery contents and possible mild mural thickening
Perineum: Fecal staining (presumptive diarrhea)
Kidneys: Multiple cortical cysts
Body as a whole: Good body condition

LABORATORY STUDIES:

OTHER: Ovaries to Repro

TISSUE STATUS:

SHELVED:	False
TRIMMED:	True
FROZEN:	False
ULTRAFROZEN:	True

Tissues Ultrafrozen: Liver (2), kidney, fat, stomach, stomach contents, small intestine with contents, colon

SPECIAL REQUESTS: On By

HISTOLOGY: On 7/20/2017 By ANC

1. LUNG
2. SPLEEN, LIVER, GALLBLADDER

3. KIDNEY
4. LYMPH NODES, MANDIBULAR, MESENTERIC; THYROID; ADRENAL
5. HEART, RIGHT AURICLE, ATRIUM, VENTRICLE and A-V VALVE, INTERVENTRICULAR SEPTUM
6. HEART, LEFT AURICLE, ATRIUM, VENTRICLE and A-V VALVE
7. TRACHEA; ESOPHAGUS; SCIATIC NERVE
8. UTERUS; VAGINA; URINARY BLADDER
9. STOMACH
10. GASTROESOPHAGEAL JUNCTION; DUODENUM; PANCREAS; JEJUNUM
11. CECUM; COLON; SMALL INTESTINE
12. BRAIN, CEREBRUM, MIDBRAIN
13. BRAIN, THALAMUS
14. BRAIN, CEREBRUM, HIPPOCAMPUS
15. BRAIN, BRAINSTEM, CEREBELLUM
16. BRAIN, BRAINSTEM, PITUITARY GLAND
17. EYE

MORPHOLOGIC DIAGNOSIS:

1) Liver: Mild Kupffer cell and hepatocyte hemosiderosis (presumptive)
2) Kidney: Mild, multifocal tubular proteinosis
3) Blood vessels, uterus, lymph node: Mild, multifocal tunica media mineralization
4) Pituitary gland, pars distalis: Moderate, multifocal mineral concretions

REMARKS: On 7/20/2017 By ANC

7/20/17: A cause for this red panda's sudden death was not determined as there were no significant gross or histologic lesions identified. Speculatively, the reported chronic hypokalemia could have resulted in a fatal arrhythmia; however, a mechanism to explain hypokalemia was also not discovered. Loss of potassium through the GI tract and kidneys are the most common pathogeneses of this condition, but these organ systems exhibited minimal pathologic changes in this panda. Although the tunica muscularis of the stomach appears thick compared with other mammals, it is comparable in size to other red pandas from this collection, making this likely to be normal for the species. The large volume of watery fluid within the stomach at the time of necropsy remains a curious finding, but may simply represent delayed gastric emptying in a stressed/ill animal. The morphologic diagnoses are all mild and considered incidental.

Andrew Cartoceti	Andrew Cartoceti	7/20/2017
PROSECTOR	PATHOLOGIST	DATE COMPLETED

Printed on: 7/24/2017 9:48:53 AM CARES-MED v2.119

Pathology Module - Final Pathology Report
NATIONAL ZOOLOGICAL PARK

PATH # N2017-0136

Death Date: 7/4/2017
Necropsy Date: 7/5/2017

EUDOCIMUS RUBER
Scarlet ibis
Name:

Gender: Unknown Sex
Age: 0Y 0M 15D

Accession No.: 216631
Birth: 19 Jun 2017
Acquired:
Removed: 04 Jul 2017

SEX: Unknown Sex AGE: 0Y 0M 15D WEIGHT: 84.4 gm STAY: <= 30 Days

MANNER OF DEATH: Found Dead
TIME OF DEATH: 07:00
DEATH LOCATION: BH38
SUBMITTOR: Shelby Burns
OWNER/ANIMAL DEPT: DOO

INTERVAL: 24-48 Hours
XRAYED: False
DISPOSITION: Incinerate
PROSECTOR: ANC

HISTORY AND CLINCICAL OBSERVATIONS:

KEEPER OBSERVATIONS: On 7/4/2017 By SB

Found dead in Ibis nest at AM checks. Chick is 3rd hatching and smallest chick of this clutch.

CLINICIAN OBSERVATIONS: On By

GROSS DESCRIPTION: On 7/5/2017 By ANC

A nestling, 84.4 gram, unknown sex, scarlet ibis is necropsied on 5 July 2017 following being found dead in the nest. The carcass is in fair postmortem condition and fair to poor body condition with moderately well-fleshed musculature but no apparent subcutaneous or intra-coelomic adipose stores. The primary and secondary flight feathers are just beginning to lose their sheaths. There is a 1 cm long laceration in the ventral intermandibular skin, just medial to the right mandible. The surrounding skin and skeletal muscle is reddened. The lungs are pink and float in formalin. The ventriculus is filled with pebbles, up to ~0.5 cm in diameter, and very small amounts of soft, green debris. The small intestine contains watery to pasty orange-brown to green ingesta and the colon is empty. A 0.3 cm diameter remnant of yolk sac is attached to the serosa of the small intestine. The adrenal glands and gonads are indistinguishable due to green discoloration (bile imbibition). The eyes, brain, oral cavity, esophagus, trachea, thyroid glands, heart, liver, gallbladder, kidneys, spleen, proventriculus, ventriculus, ceca, bursa of Fabricius, skeletal muscle and bone are grossly unremarkable.

GROSS DIAGNOSIS: By ANC

Skin, intermandibular: Focal laceration with muscular and dermal congestion
Body as a whole: Fair to poor body condition with empty upper digestive tract and scant adipose

LABORATORY STUDIES:

TISSUE STATUS:

SHELVED:	False
TRIMMED:	True
FROZEN:	False
ULTRAFROZEN:	True

Tissues Ultrafrozen: Liver (2), kidney

SPECIAL REQUESTS: On By

HISTOLOGY: On 7/21/2017 By ANC

1. LUNG; HEART; KIDNEY; ADRENAL; SPLEEN
2. LIVER; THYROID; THYMUS; TRACHEA; ESOPHAGUS; CLOACA; CLOACAL BURSA; DUODENUM; PANCREAS; OVARY
3. PROVENTRICULUS; VENTRICULUS; SMALL INTESTINE; LARGE INTESTINE; YOLK SAC REMNANT
4. BRAIN
5. HEAD, EYES, NASAL CAVITY

MORPHOLOGIC DIAGNOSIS:

1) Ventriculus: Intrakoilin yeast (consistent with Macrorhabdus ornithogaster)
2) Adipose: Diffuse atrophy

REMARKS: On 7/21/2017 By ANC

7/21/17: Histology revealed yeast consistent with Macrorhabdus ornithogaster (avian gastric yeast) colonizing the koilin layer of the ventriculus. Although yeast are present in low numbers and there are

no inflammatory/degenerative changes in the ventricular mucosa, infection can contribute to weight loss in some birds, and this may have exacerbated this bird's nutritional defecit. This bird was identified as a female on histology.

ANC	Andrew Cartoceti	7/21/2017
PROSECTOR	PATHOLOGIST	DATE COMPLETED

Printed on: 7/21/2017 4:23:59 PM CARES-MED v2.119

Pathology Module - Final Pathology Report
NATIONAL ZOOLOGICAL PARK

PATH # N2017-0137

Death Date: 7/4/2017
Necropsy Date: 7/5/2017

NANGER DAMA RUFICOLLIS
Addra gazelle
Name: Sara

Gender: Female

Age: 2Y 9M 26D

Chip: 00072AB0E1

Accession No.: 115430

Birth: 08 Sep 2014

Acquired: 22 Oct 2016

Removed: 04 Jul 2017

On loan from SAN DIEGO WILD ANIMAL PARK, SAN DIEGO

SEX: Female AGE: 2Y 9M 26D WEIGHT: 54.5 kg STAY: > 30 Days

MANNER OF DEATH:Euthanasia
TIME OF DEATH:23:30
DEATH LOCATION:Animal holding, SCBI
SUBMITTOR:KEH
OWNER/ANIMAL DEPT:DCM

INTERVAL:6-24 hours
XRAYED:False
DISPOSITION:INCINERATE
PROSECTOR:Holder

HISTORY AND CLINCICAL OBSERVATIONS:

KEEPER OBSERVATIONS: On By

CLINICIAN OBSERVATIONS: On 7/5/2017 By KEH

A live male dama gazelle calf/115569 was manually extracted on 7/4 for dystocia and dam 115430 humanely euthanized for complications associated with dystocia. Dam 115430/primiparous was observed to have vaginal blood spotting on 7/3 but otherwise visually assessed as alert and comfortable. Labor first observed approximately 1500 hr on 7/4 with water breaking approximately 1900hr, partial calf extrusion through the birth canal (proximal 1/3) without progression, calf observed to be viable, dam appeared in distress. Dam placed in tamer with light sedation, antibiotics, analgesics, and vitamin E injections also administered. Live calf easily extracted manually approximately 2230 hr on 7/4, no positional abnormalities or concerns with the calf that would suggest a cause for dystocia. Supportive care/oxygen supplementation initiated and the calf was treated with antibiotics, fluids, dextrose, and steroids for dystocia and increased/moist lung sounds following birth. Minimal fetal fluids or membranes at extraction, umbilicus was already broken/transected at extraction and could not be identified with the dam or calf. Immediately following extraction of calf 115569, dam 115430 experienced a large contraction and prolapsed majority of the uterus. Uterine tissue was edematous, inflamed with the appearance of devitalized/vascular compromise. Uterine tears were suspected on palpation of prolapsed tissue but could not be confirmed clinically due to the edema and trauma of the prolapsed uterine tissue. Uterine tissues were treated topically with oxytocin and saline with a moderate decrease in tissue size, but exteriorized tissue could not be replaced due to tissue changes and large volume of exteriorized tissue. Uterine tissue appearance/presumptive vascular compromise appeared to be progressing, and risk for septicemia, tissue necrosis, and other sequelae was determined to be high for both manual or surgical removal of uterus and prolapsed tissues. Humane euthanasia of dam 115430 was elected for severe uterine prolapse that could not be reduced, suspected

uterine tears, suspected vascular compromise, and poor prognosis. Dystocia suspected to be the result of pre-existing uterine disease or uterine changes developing during parturition. Perimortem blood collection for CBC/panel/mineral panel, body for postmortem examination.

GROSS DESCRIPTION: On 7/5/2017 By KAH

Presented for necropsy is a 54.5 kg, intact, periparturient female Addra (Dama) gazelle in good postmortem condition and good body condition. The microchip (TVN/Petlink) reads 0072AB0E1. There is an orange tag in the right ear. The udder is full. The rumen is moderately full, but the abomasum contains small amounts of vegetal matter. The colon contains well-formed fecal balls.

The uterus and placenta are prolapsed through the vagina, and the surrounding subcutaneous and peri-vaginal tissue is hemorrhagic. No tearing of the uterus or placenta is identified. There is multifocal petechial to ecchymotic intermuscular hemorrhage in the lateral abdominal muscles of the right body wall. There is scant serosanguineous fluid in the abdominal cavity. The root of the mesentery is dark red, and approximately 15 cm of jejunum is similarly reddened. The corticomedullary junction of the right adrenal is mildly hemorrhagic. Bilaterally, the carpi have multifocal 2 mm diameter depressions in the cartilage of the distal radius and proximal carpal bones. The left stifle has a 4 mm diameter erosion of the cartilage on the medial trochlear ridge.

GROSS DIAGNOSIS: By KAH

1. Uterus: Uterine prolapse, severe, with soft tissue trauma of peri-vaginal issue.

2. Jejunum: Mesenteric hemorrhage, segmental.

3. Adrenal: Corticomedulary hemorrhage, mild.

4. Carpi: Cartilage loss, multifocal, mild.

5. Stifle: Cartilage erosion, focal, mild.

LABORATORY STUDIES:

TISSUE STATUS:

SHELVED:	False
TRIMMED:	True
	False

FROZEN:

ULTRAFROZEN: True

Tissues Ultrafrozen: kidney liver lung feces

SPECIAL REQUESTS: On By

HISTOLOGY: On 7/21/2017 By KAH

1. LIVER, KIDNEY

2. KIDNEY, ADRENAL, LYMPH NODE

3. LUNG

4. HEART

5. TONGUE, TRACHEA, URINARY BLADDER, INTESTINE

6. RUMEN, ABOMASUM, RETICULUM, INTESTINE

7. OMASUM, MAMMARY, INTESTINE

8. PLACENTA

9. BRAIN W/PITUITARY

10. BRAIN

MORPHOLOGIC DIAGNOSIS:

1) Kidney: Protein-losing nephropathy, mild, with urinary space dilation and glomerular atrophy.

2) Lung: Pulmonary edema, patchy, mild to moderate.

3) Small intestine: Lymphoplasmacytic enteritis, mild.

4) Rumen, Reticulum: Lymphoplasmacytic reticulorumenitis with epithelial vacuolation and multifocal superficial necrosis.

5) Omasum: Lymphoplasmacytic omasitis with epithelial vacuolation and multifocal superficial necrosis.

6) Adrenal: Nodular adrenocortical hyperplasia, capsular surface.

REMARKS: On 7/28/2017 By KAH

As noted grossly, the uterine prolapse was severe and difficult to reduce. Placental tissue was microscopically normal.

Other histological abnormalities were not likely clinically significant or were agonal.

Holder	Holder	7/28/2017
PROSECTOR	PATHOLOGIST	DATE COMPLETED

Printed on: 7/28/2017 10:30:08 AM CARES-MED v2.119

Pathology Module - Final Pathology Report
NATIONAL ZOOLOGICAL PARK

PATH # N2017-0138

Death Date: 7/5/2017
Necropsy Date: 7/6/2017

CARDUELIS CUCULLATA
Red siskin
Name:

Gender: Unknown

Sex

Accession No.: 216634

Age: 0Y 0M 15D

Birth:
20 Jun 2017

Acquired:

Removed:
05 Jul 2017

SEX: Unknown Sex	AGE: 0Y 0M 15D	WEIGHT: 3.8 gm	STAY: <= 30 Days
MANNER OF DEATH:	Found Dead	INTERVAL:	24-48 Hours
TIME OF DEATH:	05:45	XRAYED:	False
DEATH LOCATION:	SCBI SAF, S-11	DISPOSITION:	Incinerate
SUBMITTOR:	E. Royer	PROSECTOR:	Holder
OWNER/ANIMAL DEPT:	DCO		

HISTORY AND CLINCICAL OBSERVATIONS:

KEEPER OBSERVATIONS: On 7/5/2017 By E.R

216634

SCBI Egg# 131

Dam: 216466

Sire: 216461 (estimated based on behavior)

Hatch: 20 or 21 June 2017 (more likely 21 June based on development compared to 0.0.2 siblings)

-Housed indoors with 5.5.3 conspecifics

-No cage mate aggression observed

This 14-15 day old Red siskin neonate found supine on the ground under the nest at 0545 on 5 July 2017. Rigor present. Ants and other insects present. Tissue missing from ventral side of tibiotarsi, underside of mandible, and cere (insect damage).

There are 0.0.2 chicks that remain in the nest and appear to be in good health. On 1 July, it was noted that 216634 (identified by red band on left leg; banded 30 June) had a moderate increase in respiratory rate and effort. The chick was also observed to be smaller and less developed than the other two siblings, though it may have hatched 1 day later than the other two. Treatment was started 2 July (Amprolium PO BID and Sulfatrim Pediatric suspension PO BID). On 4 July, the chick appeared bright, alert, responsive and displayed a strong feeding response at the 0600 check and throughout the day. It was found out of but next to the nest at 1520 and appeared BAR at this

time. It is likely that this smaller chick was pushed out of the nest by the two larger siblings. The chicks are due to fledge between 4-6 July.

CLINICIAN OBSERVATIONS: On By

GROSS DESCRIPTION: On 7/6/2017 By KAH

Presented for necropsy is a 3.8 g red siskin chick of unknown sex. Postmortem condition demonstrates moderate to marked autolysis. Body condition is typical for some young chicks, but there is no subcutaneous or coelomic fat visible, and the keel is noticeable. There is a red band on the left leg.

The tongue and lower pharynx are absent, as well as some of the palate. No gross abnormalities are identified in the coelom, and the whole carcass is placed in formalin for histopathology.

GROSS DIAGNOSIS: By KAH

Bodey as a whole: moderate autolysis

LABORATORY STUDIES:

TISSUE STATUS:

SHELVED:	False
TRIMMED:	False
FROZEN:	False
ULTRAFROZEN:	False

Tissues
Ultrafrozen:

SPECIAL REQUESTS: On By

HISTOLOGY: On 7/27/2017 By KAH

1. BRAIN, SKIN

2. LUNG, HEART, LIVER, KIDNEY

3. INTESTINE, LIVER

MORPHOLOGIC DIAGNOSIS:

1) Body as a whole: Autolysis

REMARKS: On 7/27/2017 By KAH

There is no histological change that indicates cause of death. Environmental stress, metabolic imbalance, or occult trauma may be considered as rule-outs.

Holder	Holder	7/27/2017
PROSECTOR	PATHOLOGIST	DATE COMPLETED

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Pathology Module - Final Pathology Report
NATIONAL ZOOLOGICAL PARK

PATH # N2017-0139

Death Date: 7/5/2017
Necropsy Date: 7/6/2017

MUSTELA NIGRIPES — Gender: Unknown Sex — Accession No.: 115573
Black-footed ferret — Age: 0Y 0M 1D — Birth: 04 Jul 2017
Name: — Acquired: 04 Jul 2017
Removed: 05 Jul 2017

SEX: Unknown Sex AGE: 0Y 0M 1D WEIGHT: 6.8 kg STAY: <= 30 Days
MANNER OF DEATH:Found Dead INTERVAL:6-24 hours
TIME OF DEATH: XRAYED:False
DEATH LOCATION:SCBI, F-14 DISPOSITION:ALL IN FORMALIN
SUBMITTOR:Vicki Lake PROSECTOR:Holder
OWNER/ANIMAL DEPT:DCM

HISTORY AND CLINCICAL OBSERVATIONS:

KEEPER OBSERVATIONS: On By
Housed indoors in an environmentally controlled area with Dam. Dam had no abnormal diet changes. Sire information: 115422 Rey (8819).

Dam 115425 (8628) whelped on 04 July 2017. Per protocol the nest box was not opened but squeaks were heard indicating she had whelped. On 05 July 2017 a kit was seen through the nest box opening to be laying motionless by the front of the box. It appeared to be by itself and the dam was attempting to cover it with Alpha-dri. It was determined a box check was necessary (usually 3 days without disturbance after a female whelps is required). At that time a single kit was found deceased ,left laterally recumbent and three other living, active, vocal kits were observed. The living kits appeared normal but were not handled. The deceased kit was removed and sent to pathology.

CLINICIAN OBSERVATIONS: On By

GROSS DESCRIPTION: On 7/6/2017 By KAH
Received for necropsy is a 6.8 g black footed ferret kit of unknown sex. The eyes are sealed and body condition is normal for the age. Autolysis is mild to moderate. The carcass is opened and placed in formalin.

GROSS DIAGNOSIS: By KAH
Body as a whole: Moderate autolysis

LABORATORY STUDIES:

TISSUE STATUS:
SHELVED: False
TRIMMED: True
FROZEN: False
ULTRAFROZEN: False

Tissues Ultrafrozen:

SPECIAL REQUESTS: On By

HISTOLOGY: On 7/27/2017 By KAH

1. HEAD, EYE, BRAIN, NASAL CAVITY
2. SKULL, HEART, LUNGS
3. LIVER, KIDNEY, INTESTINE

MORPHOLOGIC DIAGNOSIS:

1) Lung: Pulmonary edema, severe, with aspiration of meconium and squamous cells (amniotic origin).
2) Head: Subcutaneous and periosteal hemorrhage, dorsal surface.
3) Liver: Hepatic congestion and hemorrhage with marked extramedullary hematopoiesis.

REMARKS: On 7/27/2017 By KAH

The quantity of fluid and foreign material in the lung is significant, and prenatal distress is likely the cause. Given the clinical history of related kits and the recent death of the dam, sepsis is strongly suspected despite the lack of definitive lesions. It is certainly possible that maternal pathology or circulating toxins may have induced fetal distress and the subsequent aspiration noted in this case.

Holder	Holder	7/27/2017
PROSECTOR	PATHOLOGIST	DATE COMPLETED

Printed on: 7/27/2017 4:32:28 PM CARES-MED v2.119

Pathology Module - Final Pathology Report
NATIONAL ZOOLOGICAL PARK

PATH # N2017-0140

Death Date: 7/7/2017
Necropsy Date: 7/7/2017

FUKOMYS DAMARENSIS
Damara mole rat
Name:

Gender: Female

Age: 15Y 10M 6D

Chip: 432D5C5326

Accession No.: 113678

Birth:
01 Sep 2001

Acquired:

Removed:
07 Jul 2017

SEX: Female	AGE: 15Y 10M 6D	WEIGHT: 104 gm	STAY:
MANNER OF DEATH:	Euthanasia	INTERVAL:	0-6 hours
TIME OF DEATH:		XRAYED:	False
DEATH LOCATION:	WHS	DISPOSITION:	Incinerate
SUBMITTOR:	KLH	PROSECTOR:	Holder
OWNER/ANIMAL DEPT:	DOM - SMH		

HISTORY AND CLINCICAL OBSERVATIONS:

KEEPER OBSERVATIONS: On By

CLINICIAN OBSERVATIONS: On 7/7/2017 By KLH

Hx chronic perioral dermatitis (hx yeast, but suspect additional bacterial component recently). Has been managed with topical medications (chlorhexidine and nystatin or SSD) for over 3 years, but severity of infection appears worse recently. Animal has been steadily losing condition over past several months as well. Based on age, chronic disease, and loss of condition, euthanasia was elected. Animal was anesthetized with isoflurane and administered euthasol 0.3ml intracardiac.

Note: radiographs were not taken today as they were performed 2 weeks ago and at that time were unremarkable.

GROSS DESCRIPTION: On 7/7/2017 By KAH

Presented for necropsy is a 104 g intact female Damaraland mole-rat. Autolysis is minimal and body condition is diminished, with slight subcutaneous and intra-abdominal fat. Muscling is not robust. A transponder chip in the dorsal subcutis reads: 432D5C5326. The stomach is full of soft ingesta and mucus. The colon is empty.

The peri-oral facial skin is thickened, brown, and crusted.

GROSS DIAGNOSIS: By KAH

1. Peri-oral facial skin: Hyperkeratotic dermatitis, locally extensive, chronic.

2. Body as a whole: Diminished body condition.

LABORATORY STUDIES:

TISSUE STATUS:

SHELVED:	False
TRIMMED:	True
FROZEN:	False
ULTRAFROZEN:	True
Tissues Ultrafrozen:	liver kidney

SPECIAL REQUESTS: On By

HISTOLOGY: On 7/27/2017 By KAH

1. FACIAL SKIN
2. BRAIN, EYELID
3. KIDNEY, LIVER
4. KIDNEY, SPLEEN, STOMACH
5. LUNG, INTESTINE

MORPHOLOGIC DIAGNOSIS:

1) Heart: Fibromyxomatous myocardial degeneration, locally extensive, moderate

2) Lung: Pulmonary edema, marked.

3) A) Skin, muzzle: Suppurative and proliferative dermatitis, with parakeratotic hyperkeratosis, pustule formation, rare intranuclear inclusions of

3) B) Skin (cont.): epidermal cells, and crusts containing colonies of cocci and yeast.

4) Skin, vibrissae: Mineralization of vibrissae sheath wall.

5) Kidney: Renal cysts, multifocal.

6) Kidney: Interstitial fibrosis, multifocal, mild.

7) Liver: Vacuolar degeneration, moderate.

8) Liver: Hepatic necrosis, minimal, focal.

REMARKS: On 7/27/2017 By KAH

The etiology of the chronic facial dermatitis is uncertain. There is definitely a current bacterial and yeast component. The intranuclear inclusions are rare and suggest a potential viral contribution. Formalin fixed paraffin embedded tissue is available if further investigation of viral etiologies are desired. Papovaviruses (pox and papilloma) as well as herpesviruses are potential differentials. The most common cause of crusting facial lesions in naked mole rats is conspecific trauma complicated by secondary infections.* No systematic reports were found for Damaraland mole rats.

Poor clinical condition is likely related to age-associated degeneration of the heart and subsequent pulmonary edema, though some degree of pulmonary edema may be agonal.

*Delaney, M. A., Nagy, L., Kinsel, M. J., & Treuting, P. M. (2013). Spontaneous Histologic Lesions of the Adult Naked Mole Rat (Heterocephalus glaber). Veterinary Pathology, 50(4), 607-621. https://doi.org/10.1177/0300985812471543

Holder	Holder	7/27/2017
PROSECTOR	PATHOLOGIST	DATE COMPLETED

Printed on: 7/27/2017 4:49:24 PM CARES-MED v2.119

Pathology Module - Final Pathology Report
NATIONAL ZOOLOGICAL PARK

PATH # N2017-0141

Death Date: 7/9/2017
Necropsy Date: 7/10/2017

PARACHEIRODON AXELRODI
Cardinal tetra
Name:

Gender: Unknown Sex
Age:

Accession No.: 500808
Birth:
Acquired: 20 Oct 2014
31 Dec 2016

SEX: Unknown Sex AGE: ADULT WEIGHT: 0.4 gm STAY:

MANNER OF DEATH: Found Dead
TIME OF DEATH: 15:00
DEATH LOCATION: Amazonia FSA6
SUBMITTOR: Ed Smith
OWNER/ANIMAL DEPT: DOA

INTERVAL: 6-24 hours
XRAYED: False
DISPOSITION: Formalin
PROSECTOR: ANC

HISTORY AND CLINCICAL OBSERVATIONS:

KEEPER OBSERVATIONS: On 7/9/2017 By ES

animal found dead in plants during pm check. community tank with multiple individuals - group appears unremarkable

CLINICIAN OBSERVATIONS: On By

GROSS DESCRIPTION: On 7/12/2017 By ANC

A 0.4 gram, adult, unknown sex, cardinal tetra is necropsied on 10 July 2017 following being found dead. The fish has a total length of 3.5 cm and is in poor postmortem condition with most of the head, including the left eye, missing. The carcass is placed into formalin whole.

GROSS DIAGNOSIS: By ANC

Advanced postmortem autolysis

LABORATORY STUDIES:

TISSUE STATUS:

SHELVED:	False
TRIMMED:	True
FROZEN:	False
ULTRAFROZEN:	False

Tissues Ultrafrozen:

SPECIAL REQUESTS: On By

HISTOLOGY: On 7/28/2017 By ANC

1. WHOLE BODY

MORPHOLOGIC DIAGNOSIS:

1) Coelom: Mulltiple granulomas
2) Coelom: Intracoelomic nematodes

REMARKS: On 7/28/2017 By ANC

7/28/17: Several small granulomas adjacent to the liver and intestinal tract are suspicious for mycobacteriosis. Additionally, small (possibly larval?) nematodes were present in the coelom and soft tissues surrounding the vertebrae. Nematodes are not contained within a granulomatous response and may be clinically insignificant. Due to the marked autolysis of the tissues, nematodes can not be more specifically identified.

ANC	Andrew Cartoceti	7/28/2017
PROSECTOR	PATHOLOGIST	DATE COMPLETED

Printed on: 7/28/2017 3:33:19 PM CARES-MED v2.119

Pathology Module - Final Pathology Report
NATIONAL ZOOLOGICAL PARK

PATH # N2017-0142

Death Date: 7/8/2017
Necropsy Date: 7/8/2017

MUSTELA NIGRIPES
Black-footed ferret
Name:

Gender: Male
Age: 0Y 0M 16D

Accession No.: 115564
Birth: 22 Jun 2017
Acquired: 22 Jun 2017
Removed: 08 Jul 2017

SEX: Male | AGE: 0Y 0M 16D | WEIGHT: 0 gm | STAY: <= 30 Days

MANNER OF DEATH: Euthanasia
TIME OF DEATH: 08:15
DEATH LOCATION: Vet hospital, SCBI
SUBMITTOR: KH
OWNER/ANIMAL DEPT: DCM

INTERVAL: Not recorded
XRAYED: False
DISPOSITION: Formalin
PROSECTOR: KH

HISTORY AND CLINCICAL OBSERVATIONS:

KEEPER OBSERVATIONS: On By

CLINICIAN OBSERVATIONS: On 7/8/2017 By KH

This kit/115564 was born to dam 115103, 0.0.4 in litter. Dam 115103 had a previous litter in 2017 that all died from E. coli septicemia. From current litter, littermate 115565 was euthanized 6/29/17 for declining health, perineal/abdominal pustules, E. coli cultured. Remaining 0.0.3 kits were treated with antibiotics based on C&S, 2/3 kits had visible perineum and abdominal pustules. Kit 115564 was most severely affected. All kits initially responded to treatment, this kit/115564 developed severe rapid weight loss over 2 days and was humanely euthanized for severe weight loss and declining activity/health. E. coli septicemia or sequelae to bacterial septicemia is suspected. Humanely euthanized under isoflurane anesthesia with euthanasia solution (0.05ml in 0.15ml sterile water) by intracardiac injection. Postmortem liver culture obtained shortly following confirmation of death; whole body in formalin to pathologists.

Gross visual observations: Thin body condition/reduced muscling. Thoracic cavity hemorrhage consistent with extracardiac euthanasia administration. General pallor to organs. Distal intestinal tract was moderately distended with gas and yellow mucoid material. Whole body in formalin.

GROSS DESCRIPTION: On 7/14/2017 By KH

Gross visual observations: Thin body condition/reduced muscling. Thoracic cavity hemorrhage consistent with extracardiac euthanasia administration. General pallor to organs. Distal intestinal tract was moderately distended with gas and yellow mucoid material. Whole body in formalin.

GROSS DIAGNOSIS: By ANC

Thin body condition
Intestinal tract: Gas and mucoid feces

LABORATORY STUDIES:

CULTURE: Postmortem/liver culture to Antech for C&S
Postmortem/intestine culture to Antech for C&S

TISSUE STATUS:

SHELVED:	False
TRIMMED:	False
FROZEN:	False
ULTRAFROZEN:	False

Tissues Ultrafrozen:

SPECIAL REQUESTS: On 7/8/2017 By KH

Postmortem/liver culture to Antech for C&S
Postmortem/intestine culture to Antech for C&S

HISTOLOGY: On 8/2/2017 By ANC

1. HEART; LUNG; THYMUS
2. LIVER; KIDNEY; SPLEEN; URINARY BLADDER; TRACHEA; ESOPHAGUS
3. STOMACH; SMALL INTESTINE; LARGE INTESTINE
4. HEAD, NASAL CAVITY, EYES, BRAIN
5. HEAD, BRAIN
6. HEAD, EYES, BRAIN
7. HEAD, BRAIN

MORPHOLOGIC DIAGNOSIS:

1) Nasal cavity: Moderate, suppurative rhinitis with intraluminal exudate and necrotic cellular debris
2) Small intestine: Mild, segmental, acute, necrotizing enteritis with villus blunting
3) Adipose: Diffuse atrophy

REMARKS: On 8/2/2017 By ANC

8/2/17: Systemic E. coli infection is the presumptive cause of death as the rhinitis and enteritis present in this animal are consistent with those seen in other kits from which E. coli was isolated. Postmortem cultures of liver and intestine yielded no growth, likely due to antibiotic therapy.

KH	Andrew Cartoceti	8/2/2017
PROSECTOR	PATHOLOGIST	DATE COMPLETED

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Pathology Module - Final Pathology Report
NATIONAL ZOOLOGICAL PARK

PATH # N2017-0143

Death Date: 7/12/2017
Necropsy Date: 7/12/2017

LANIUS LUDOVICIANUS MIGRANS
Loggerhead shrike
Name:

Gender: Unknown Sex
Age: 0Y 0M 27D

Accession No.: 216626
Birth: 15 Jun 2017
Acquired: 15 Jun 2017
Removed: 12 Jul 2017

SEX: Unknown Sex AGE: 0Y 0M 27D WEIGHT: 0 gm STAY: <= 30 Days

MANNER OF DEATH: Euthanasia
TIME OF DEATH: 14:37
DEATH LOCATION: SCBI Hospital
SUBMITTOR: Kelly Helmick
OWNER/ANIMAL DEPT: DCM

INTERVAL: 6-24 hours
XRAYED: False
DISPOSITION: Formalin
PROSECTOR: Kelly Helmick

HISTORY AND CLINCICAL OBSERVATIONS:

KEEPER OBSERVATIONS: On By

CLINICIAN OBSERVATIONS: On 7/12/2017 By KH

Urgent exam with hospitalization, found on ground, significant respiratory rate elevation and effort.
History: No prior medical history
Exam, urgent: This approximately 27 day shrike is alert and responsive at handling with significant increase in both respiratory rate and effort, ophthalmic and oral exam WNl, beak/cere WNL, no audible concenrs on thoracic auscultation, coelomic palpation WNL, vent pasty, feet/legs in good condition, tacky oral mucous membranes/presumptive dehydration, exhibits lethargy/weakness and increased dyspnea at rest/no handling. Treated at unit with SQ fluids/dextrose/B-complex, antibiotics (enrofloxacin), analgesics (meloxicam), and deworming (ivermectin and fenbendazole PO).
Hospitalization: patient moved from incubator room to hospital shortly after treatment administration due to progressive dyspnea. Placed in oxygen with thermal support. Dyspnea continues under oxygenation. Prognosis poor.
Addendum 1437: Patient humanely euthanized due to persistent severe dyspnea. Expired under isoflurane anesthesia to facilitate humane euthanasia. Gross postmortem performed in -house.

GROSS DESCRIPTION: On 7/12/2017 By KH

Gross postmortem findings:
General condition: no external abnormalities, signs of trauma. tacky membranes. pasty yellow urates at vent
Body cavities: NSF, membranes/serosal surfaces appeared tacky
Respiratory: NSF. Trachea free of apparent foreign objects from oral cavity to syrinx. Air sacs clear/intact. Both lungs float in formalin
Liver: NSF. Obtained culture for a/an
GIT: Oral cavity free of foreign material. Stomach contained moderate amount of digested food material (worm casings, fur). Observations not consistent with impaction. All GIT findings WNL.
Caradiovascular, Renal, Musculoskeletal: NSF
Gonads, endocrine, special senses: not examined

GROSS DIAGNOSIS: By ANC

No significant lesions identified

LABORATORY STUDIES:
CULTURE: Liver

TISSUE STATUS:

SHELVED:	False
TRIMMED:	False
FROZEN:	False
ULTRAFROZEN:	False

Tissues Ultrafrozen:

SPECIAL REQUESTS: On 7/12/2017 By KH

Tissue/carcass disposition:
In formalin to NZP pathology: trachea, lung, heart, liver, spleen, pancreas, kidney, gonads, esophagus, stomach, intestine, skeletal muscle with skin. Whole body remains in separate formalin container.
Culture/liver to NZP for a/an cx

HISTOLOGY: On 8/3/2017 By ANC

1. HEART; LUNG
2. SPLEEN; LIVER; KIDNEY; OVARY; OVIDUCT; ADRENAL

3. BRAIN
4. SMALL INTESTINE; LARGE INTESTINE; TRACHEA; ESOPHAGUS
5. PROVENTRICULUS; VENTRICULUS; SKELETAL MUSCLE
6. HEAD; NASAL CAVITY; EYES

SPECIAL STAINS:
6. Ziehl-Neelsen Acid-Fast, Periodic Acid Schiff, Brown & Hopps: There are abundant Gram-negative rods within inflammed nasolacrimal duct lumina and turbinate submucosa.

MORPHOLOGIC DIAGNOSIS:

1) Nasal cavity: Moderate to severe, bilateral, heterophilic and ulcerative rhinitis
2) Nasolacrimal ducts: Moderate to severe, bilateral, heterophilic and histiocytic dochitis with focal heterophilic granuloma
3) Trachea: Moderate, segmental, heterophilic tracheitis
4) Small intestine, colon: Mild, segmental, heterophilic enterocolitis with crypt hyperplasia
5) Spleen: Intraellipsoid protein fragments (suspect hemoglobin)

REMARKS: On 8/3/2017 By ANC

8/3/17: The cause of this shrike's respiratory signs is bilateral upper respiratory inflammation. An infectious etiology is suspected and although organisms are not evident on routine staining, bacterial and fungal causes are considered most likely. Special stains for microorganisms are pending and results will be communicated in an addendum. This shrike does not have evidence of squamous metaplasia. The remaining diagnoses are considered mild and less clinically significant.

8/25/17: Special stains revealed Gram-negative rod-shaped bacteria as the cause cause of upper respiratory infection. Fungi and acid-fast bactera were not evident.

Kelly Helmick	Andrew Cartoceti	8/3/2017
PROSECTOR	PATHOLOGIST	DATE COMPLETED

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Pathology Module - Final Pathology Report
NATIONAL ZOOLOGICAL PARK

PATH # N2017-0144

Death Date: 7/13/2017
Necropsy Date: 7/13/2017

ATELOPUS ZETEKI
Panamanian golden frog
Name:

Gender: Male
Age: 12Y 0M 15D

Accession No.: 307459
Birth: 28 Jun 2005
Acquired: 03 Jun 2013
Removed: 13 Jul 2017

On loan from BALTIMORE ZOO, BALTIMORE

SEX: Male | AGE: 12Y 0M 15D | WEIGHT: 3 gm | STAY: > 30 Days

MANNER OF DEATH: Euthanasia
TIME OF DEATH: 14:00
DEATH LOCATION: WHS
SUBMITTOR: KLH
OWNER/ANIMAL DEPT: DOH

INTERVAL: 0-6 hours
XRAYED: False
DISPOSITION: Formalin
PROSECTOR: ANC

HISTORY AND CLINCICAL OBSERVATIONS:

KEEPER OBSERVATIONS: On By

CLINICIAN OBSERVATIONS: On 7/13/2017 By KLH

Frog has a several month history of hind leg weakness. Treated with topical calcium and magnesium. over past 1-2 weeks, animal has gotten progressively weaker, and today was seen all day with legs extended and unable to pull them in. Humane euthanasia with MS-222 intracoelomically was performed.

GROSS DESCRIPTION: On 7/14/2017 By ANC

An adult, 3.0 gram, male, Panamanian golden frog is necropsied on 14 July 2017 following euthanasia for tetany. The carcass is in good postmortem condition and fair body condition with mild appendicular muscle atrophy, obvious bony prominences and small fat bodies. The eyes, heart, lungs, liver, spleen, kidneys, testes, urinary bladder and gastrointestinal tract are grossly unremarkable.

GROSS DIAGNOSIS: By ANC

Body as a whole: Fair body condition

LABORATORY STUDIES:

TISSUE STATUS:

SHELVED:	False
TRIMMED:	True
FROZEN:	False
ULTRAFROZEN:	True

Tissues Ultrafrozen: liver

SPECIAL REQUESTS: On By

HISTOLOGY: On 8/4/2017 By ANC

1. LUNG; LIVER; GALLBLADDER; KIDNEY; TESTES; BIDDER'S ORGAN; SPLEEN; HEART; URINARY BLADDER
2. TONGUE; TRACHEA; ESOPHAGUS; STOMACH; SMALL INTESTINE; LARGE INTESTINE; FAT BODY
3. HEAD; BRAIN; PITUITARY GLAND; EYES; SPINE
4. FEET; HINDLIMB

MORPHOLOGIC DIAGNOSIS:

1) Liver: Melanomacrophage hyperplasia

REMARKS: On 8/4/2017 By ANC

8/4/17: A cause for this frog's inability to right itself/tetany was not identified. There were no gross or histologic lesions evident within the skeletal muscle, central or peripheral nervous systems. Aberrations in ions that are essential for normal function (i.e. Na, Ca, K), that do not become manifested as a morphological change, are still considered possible.

ANC	Andrew Cartoceti	8/4/2017
PROSECTOR	PATHOLOGIST	DATE COMPLETED

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Pathology Module - Final Pathology Report
NATIONAL ZOOLOGICAL PARK

PATH # N2017-0145

Death Date: 7/13/2017
Necropsy Date: 7/13/2017

TOLYPEUTES MATACUS
Southern three-banded armadillo
Name: Bonnie

Gender: Female
Age: 18Y 10M 0D
Chip: 44643B3F0C

Accession No.: 113351
Birth: 13 Sep 1998
Acquired:
Removed: 13 Jul 2017

SEX: Female AGE: 18Y 10M 0D WEIGHT: 1.042 kg STAY: <= 30 Days

MANNER OF DEATH: Found Dead
TIME OF DEATH: 14:30
DEATH LOCATION: SMH31
SUBMITTOR: Ashton Ball
OWNER/ANIMAL DEPT: DOM - SMH

INTERVAL: 0-6 hours
XRAYED: False
DISPOSITION: Incinerate
PROSECTOR: ANC

HISTORY AND CLINCICAL OBSERVATIONS:

KEEPER OBSERVATIONS: On 7/13/2017 By AB

0.1 Armadillo 113351 "Bonnie" was found DOA in her nest in SMH 31. She had a recent history of very slow weight loss. Her last weight on 6/22/17 was 1.182kg. Her weight at death was 1.035kg. There had been no major husbandry changes, no aggression noted and no known health problems. She was up and active yesterday afternoon.

CLINICIAN OBSERVATIONS: On By

GROSS DESCRIPTION: On 7/14/2017 By ANC

An adult, 1.042 kilogram, spayed female Brazilian three-banded armadillo is necropsied on 13 July 2017 following being found dead. The carcass is in poor postmortem condition with a putrid odor, mild sloughing of the skin around the mouth and discolored and friable viscera. Body condition is poor with no appreciable adipose stores. Within the skin of the ventrum, there are few, small (2-3 mm diameter), dry, red, crusted foci (scabs). The perineum is crusted with dark brown, dry material (feces). Within the parietal pleura, there are few soft, stellate, white discolorations that extend slightly into the underlying parenchyma. Both kidneys have an irregular nodular cortical contour and there is white to pale brown streaking in the medulla. The stomach contains small amounts of thin, milky white-pink fluid and small flecks of soft, dark red material (clotted blood). The small and large intestine contain watery, pale brown fluid and excess gas. A maxillary cheek tooth is excessively worn down to the gingiva; the remaining teeth are unremarkable. The eyes, brain, oral cavity, esophagus, trachea, heart, diaphragm, liver, gallbladder, adrenal glands and spleen are grossly unremarkable.

GROSS DIAGNOSIS: By ANC

Kidney: Bilateral chronic renal disease
Lung: Multifocal, chronic pleural fibrosis
Stomach: Mild, multifocal, acute, petechial mucosal hemorrhage
Body as a whole: Poor body condition with minimal adipose

LABORATORY STUDIES:

TISSUE STATUS:

SHELVED:	False
TRIMMED:	True
FROZEN:	False
ULTRAFROZEN:	True

Tissues Ultrafrozen: Liver (2), kidney, lung

SPECIAL REQUESTS: On By

HISTOLOGY: On 8/7/2017 By ANC

1. BRAIN
2. BRAIN
3. LUNG
4. SPLEEN; KIDNEY; ADRENAL
5. LIVER; GALLBLADDER; SALIVARY GLAND
6. HEART
7. STOMACH
8. SMALL INTESTINE; PANCREAS; LARGE INTESTINE
9. TONGUE; TRACHEA; ESOPHAGUS; THYROID
10. HEAD, EYES, NASAL CAVITY
11. NASAL CAVITY; EYE

12. NASAL CAVITY

SPECIAL STAINS
Masson's Trichrome (Slides 4, 9)
Congo Red (Slides 1, 4, 5, 9)

MORPHOLOGIC DIAGNOSIS:

1) Blood vessels: Moderate, multifocal arterio- and arteriolosclerosis with tunica media hyalinization (amyloidosis)
2) (A) Kidney: Moderate, multifocal to regionally extensive, chronic, tubular necrosis with lymphocytic interstitial nephritis, peritubular and
2) (B) periglomerular fibrosis, and tubular mineralization, ectasia and intraluminal crystals (oxalate-type)
3) Kidney: Focal diffuse glomerular mesangial thickening and hyalinization (amyloidosis)
4) Thyroid gland: Regionally extensive, perifollicular, interstitial thickening and hyalinization with follicular collapse (amyloidosis)
5) Salivary gland: Diffuse, periglandular, interstitial thickening and hyalinization with glandular atrophy and collapse (amyloidosis)
6) Brain: Multifocal plaques
7) Heart: Mild to moderate, multifocal, interstitial myocardial fibrosis with myofiber atrophy
8) Adipose: Diffuse atrophy
9) Heart: Mild, multifocal, chronic, lymphoplasmacytic pericarditis and myocarditis
10) Lung: Mild to moderate, multifocal pleural fibrosis
11) Liver: Mild, multifocal to regional, centrilobular sinusoidal congestion

REMARKS: On 8/25/2017 By ANC

8/25/17: Additional sections of the head, including the eyes, nasal cavity, teeth and olfactory bulbs, did not reveal additional disease. Systemic amyloid deposition was confirmed in blood vessels walls and connective tissue interstitium in many locations; however, suspect amyloid plaques in the brain were negative on Congo Red staining.

8/7/17: Widespread thickening and hyalinization of blood vessel walls and the interstitium in several organs is consistent with systemic amyloidosis, although special stains to definitively confirm amyloid are pending. Amyloidosis in the salivary and thyroid glands appears to cause atrophy of many glandular units and could be resulting in clinical insufficiencies in these organs (i.e. hypothyroidism), as is known to occur in humans. Interestingly, suspected amyloid in the neuropil of the brain resembles the neuritic plaques seen in humans with Alzheimer's disease, although in this case this likely represents an expected senile process in an aged animal. Amyloidosis in exotic animals is typically due to a sustained inflammatory state; based on the histologic findings and the propensity for this species to develop renal disease, the kidney are considered the most likely source of chronic inflammation responsible for inciting amyloidosis. Suspected amyloidosis is likely contributing to degeneration and fibrosis in both the heart and kidneys through local tissue hypoxia. Cardiac and renal disease in turn may exacerbate the vascular lesions in a vicious cycle. Renal disease is severe and may have entered into clinical renal insufficiency/failure. Tubular oxalate crystals are a sequela (not a cause) of severe renal disease. Gastric reddening could not be further investigated histologically based on the level of autolysis within the tissue. The remaining findings in the heart, lung and liver are considered less clinically significant. Additional sections of the head are pending decalcification.

ANC	Andrew Cartoceti	8/25/2017
PROSECTOR	PATHOLOGIST	DATE COMPLETED

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Pathology Module - Final Pathology Report
NATIONAL ZOOLOGICAL PARK

PATH # N2017-0146

Death Date: 7/15/2017
Necropsy Date: 7/15/2017

NEMATOBRYCON PALMERI
Emperor tetra
Name:

Sex

Gender: Unknown

Accession No.: 500875

Age:

Birth:

Acquired: 03 May 2016

SEX: Unknown Sex AGE: ADULT WEIGHT: 3 gm STAY: > 30 Days

MANNER OF DEATH:Found Dead
TIME OF DEATH:08:45
DEATH LOCATION:FSA5
SUBMITTOR:Hilary Colton, Amazonia
OWNER/ANIMAL DEPT:DOA

INTERVAL:0-6 hours
XRAYED:False
DISPOSITION:FORMALIN
PROSECTOR:Tracy Clippinger

HISTORY AND CLINCICAL OBSERVATIONS:

KEEPER OBSERVATIONS: On 7/15/2017 By HC

0.0.1 Emperor tetra found dead in FSA5 during morning temperature readings. No obvious trauma on body, somewhat bloated on removal. This tank has been determined to be mycobacteria positive (+). 0.0.6 tankmates remain, all BAR.

CLINICIAN OBSERVATIONS: On By

GROSS DESCRIPTION: On 7/15/2017 By tlc

The carcass of a deceased adult Emperor tetra, sex unknown pending histology, is received on 15 July 2017 for necropsy. The 5.6 cm carcass weighs 3 gm. A 2x1 mm red area is on the right side of the body mid-body aligned with the dorsal spinous fins just dorsal to the lateral line and 2.5cm from the head. A smaller 1x1 mm red area is the same plane 3.2cm from the head. The gills are pale tan and the corneas are clear. Adequate body fat is present whenever overlying skin/musculature is reflected to view the coelom. Autolysis appears to be minimal grossly. No other gross lesions observed. Carcass placed into 10% formalin for histology.

GROSS DIAGNOSIS: By KAH

Cutaneous erythema is a frequent finding in fish with systemic infections, skin infections, or history of abrasion. Histopathology is pending.

LABORATORY STUDIES:

TISSUE STATUS:

SHELVED:	False
TRIMMED:	True
FROZEN:	False
ULTRAFROZEN:	False

Tissues
Ultrafrozen:

SPECIAL REQUESTS: On By

HISTOLOGY: On 7/28/2017 By KAH

1. LIVER, GILL

2. LIVER, INTESTINE

3. HEAD, EYES, BRAIN, GILL

MORPHOLOGIC DIAGNOSIS:

1) Body as a whole: Multisystemic granulomas in all tissues with intralesional organisms consistent with Mycobacterium spp.

2) Gill: Solitary granuloma with intralesional arthropod parasite.

REMARKS: On 7/28/2017 By KAH

While the widespread granulomatous disease is unsurprising in this fish from a tank with a history of mycobacteriosis, the incidental finding of an arthropod parasite may be relevant to the management of the tank. Arthropod parasites such as isopods and copepods are more commonly seen in marine fish, but they can and do affect freshwater populations.

Tracy Clippinger	Holder	7/28/2017
PROSECTOR	PATHOLOGIST	DATE COMPLETED

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Pathology Module - Final Pathology Report
NATIONAL ZOOLOGICAL PARK

PATH # N2017-0147

Death Date: 7/15/2017
Necropsy Date: 7/15/2017

HEROS APPENDICULATUS
Cichlid
Name:

Gender: Unknown
Sex

Accession No.: 500851

Age:

Birth:

Acquired: 23 Jun 2015

31 Dec 2016

SEX: Unknown Sex AGE: ADULT WEIGHT: 194.1 gm STAY: > 30 Days
MANNER OF DEATH: Found Dead INTERVAL: 0-6 hours
TIME OF DEATH: 14:30 XRAYED: False
DEATH LOCATION: Pool 4 DISPOSITION: FORMALIN
SUBMITTOR: Christina Castiglione - AMZ PROSECTOR: Clippinger
OWNER/ANIMAL DEPT: DOA

HISTORY AND CLINCICAL OBSERVATIONS:

KEEPER OBSERVATIONS: On 7/15/2017 By CC

0.0.1 500851 Orange necktie severums found dead in pool 4 at PM feed. This fish was observed with facial lesions and abnormal swimming patterns for months.

CLINICIAN OBSERVATIONS: On By

GROSS DESCRIPTION: On 7/15/2017 By tlc

The carcass of an adult orange necktie severum cichlid of unknown sex is received on 15 July 2017 late afternoon for necropsy. The 19.2 cm carcass weighs 194.1 gm. Many scales are absent over a diffuse portion of the body, more so on the left side. The left cornea bulges and is cloudy. Adequate body fat is present. Autolysis appears to be moderate and identification of some organs was inconclusive. The gills are pale tan and irregular along the margin bilaterally. Red-tinged fluid is present in the coelomic cavity. A swab is used to collect a sample of coelomic fluid that is refrigerated for culture, if indicated. The presumed gonad is enlarged with multiple cyst-like features. A piece of this organ and another smooth unidentified organ is collected and frozen at -80. The gall bladder is full. The swim bladder is intact and air-filled. Coelomic organs, eyes, and gills are removed and placed into 10% formalin. Cuts are made into sections of the head and musculature to allow fixative penetration and the remaining carcass is also placed into 10% formalin.

GROSS DIAGNOSIS: By KAH

Left eye: Exophthalmos

Coelom: Transudate of unknown origin

Body as a whole: Moderate autolysis

LABORATORY STUDIES:

CULTURE: Swab of coelomic fluid taken and refrigerated to hold for culture, if indicated.

TISSUE STATUS:

SHELVED: False

TRIMMED: True

FROZEN: False

ULTRAFROZEN: False

Tissues
Ultrafrozen:

SPECIAL REQUESTS: On By

HISTOLOGY: On 8/1/2017 By KAH

1. HEART, CYSTIC MASS, SKELETAL MUSCLE, TESTIS

2. LIVER, INTESTINE, GONAD

3. GILL, EYE

MORPHOLOGIC DIAGNOSIS:

1) Body as a whole: Multisystemic granulomas. Presumptive mycobacteriosis

2) Body as a whole: severe autolysis.

3) Coelom: Polycystic mass

REMARKS: On 8/1/2017 By KAH

The autolysis in this case was so severe that organ identification was frequently obscured. Despite this, granulomas were abundant and identifiable in most organs. Tissue of origin for the polycystic mass is undetermined. Differentials include spleen, pancreas, or kidney.

Clippinger	Holder	8/1/2017
PROSECTOR	PATHOLOGIST	DATE COMPLETED

Printed on: 8/1/2017 3:03:05 PM CARES-MED v2.119

Pathology Module - Final Pathology Report
NATIONAL ZOOLOGICAL PARK

PATH # N2017-0148

Death Date: 7/16/2017
Necropsy Date: 7/16/2017

CORYDORAS (unk sp)
Corydoras catfish
Name:

Sex

Gender: Unknown

Accession No.: 500859

Age:

Birth:

Acquired: 15 Sep 2015

31 Dec 2016

SEX: Unknown Sex AGE: ADULT WEIGHT: 2.1 gm STAY: > 30 Days

MANNER OF DEATH:Found Dead
TIME OF DEATH:07:25
DEATH LOCATION:Fish Holding-8
SUBMITTOR:Lando McCall - AMZ
OWNER/ANIMAL DEPT:DOA

INTERVAL:0-6 hours
XRAYED:False
DISPOSITION:FORMALIN
PROSECTOR:Clippinger

HISTORY AND CLINCICAL OBSERVATIONS:

KEEPER OBSERVATIONS: On 7/16/2017 By LM

Found fish deceased at bottom of Fish Holding-8. Body was unremarkable. Recovered and placed in bag for submittal.

CLINICIAN OBSERVATIONS: On By

GROSS DESCRIPTION: On 7/16/2017 By tlc

The carcass of a deceased adult orange laser cory, sex unknown pending histology, is received on 16 July 2017 for necropsy. The 4.5 cm carcass weighs 2.1 gm. Two red lines are evident at 1.0 and 1.3 cm from the head on the right side of the body. The gills are pale white, and the corneas are clear. Whenever the overlying skin/musculature is reflected to view the coelom on both sides, lacey pale tissue was seen and may represent adipose tissue. A red spot was noted ventrally near the midline. Autolysis appears to be mild to moderate grossly. No other gross lesions observed. Carcass placed into 10% formalin for histology.

GROSS DIAGNOSIS: By

Skin: Multifocal erythema.

LABORATORY STUDIES:

TISSUE STATUS:

SHELVED:	False
TRIMMED:	True
FROZEN:	False
ULTRAFROZEN:	False

Tissues
Ultrafrozen:

SPECIAL REQUESTS: On By

HISTOLOGY: On 8/23/2017 By KAH

1. OVARY, LIVER, INTESTINE, HEART, KIDNEY

2. HEAD, KIDNEYS, BODY

MORPHOLOGIC DIAGNOSIS:

1) Whole body: Moderate to severe postmortem autolysis.

2) Meninges and nerve roots: Meningitis, ganglioneuritis, histiocytic.

REMARKS: On 8/23/2017 By KAH

Autolysis in this case was severe and may have obscured relevant diagnostic lesions. In addition to the meningitis and ganglioneuritis, there is a population of round cells invading nerve roots that may represent a round cell tumor. Differentials include gonadal tumor or lymphoid neoplasm.

Clippinger	Holder	8/23/2017
PROSECTOR	PATHOLOGIST	DATE COMPLETED

Printed on: 8/23/2017 10:07:43 AM CARES-MED v2.119

Pathology Module - Final Pathology Report
NATIONAL ZOOLOGICAL PARK

PATH # N2017-0149

Death Date: 7/16/2017
Necropsy Date: 7/16/2017

GEOPHAGUS (unk sp)
Eartheater
Name:

Gender: Unknown

Sex

Accession No.: 500846

Age:

Birth:

Acquired: 12 May 2015

31 Dec 2016

SEX: Unknown Sex AGE: ADULT WEIGHT: 44.6 gm STAY: > 30 Days

MANNER OF DEATH: Found Dead
INTERVAL: 0-6 hours
TIME OF DEATH: 06:45
XRAYED: False
DEATH LOCATION: Pool 4
DISPOSITION: FORMALIN
SUBMITTOR: Christina Castiglione - AMZ
PROSECTOR: Clippinger
OWNER/ANIMAL DEPT: DOA

HISTORY AND CLINCICAL OBSERVATIONS:

KEEPER OBSERVATIONS: On 7/16/2017 By CC

0.0.1 500846 Earth-eater cichlid found dead in pool 4 during AM walk through. Specimen autolyzed and especially fragrant. Fish in tank are BAR so far this morning. This pool has been determined to be mycobacteria positive (+).

CLINICIAN OBSERVATIONS: On By

GROSS DESCRIPTION: On 7/16/2017 By tlc

The carcass of a deceased adult Earth-eater cichlid, sex unknown pending histology, is received on 16 July 2017 morning for necropsy. The 14.5 cm carcass weighed 44.6 gm. The remains are malodorous. Many scales are absent over a diffuse portion of the right side of the body, and some are absent irregularly on the right side. The right eye is cloudy but translucent enough to see the pupil. The left eye is displaced forward and sunken in the socket. The gills were pale white and markedly autolyzed bilaterally. Autolysis appears to be severe and gross identification of most organs is inconclusive. The swim bladder is intact and air-filled, but disintegrates open when touched. Coelomic organs were removed and placed into 10% formalin. Cuts were made into sections of the head and musculature to allow fixative penetration and the remaining. Carcass was also placed into 10% formalin.

GROSS DIAGNOSIS: By KAH

Body as a whole: Severe autolysis.

LABORATORY STUDIES:

TISSUE STATUS:

SHELVED:	False
TRIMMED:	True
FROZEN:	False
ULTRAFROZEN:	False

Tissues
Ultrafrozen:

SPECIAL REQUESTS: On By

HISTOLOGY: On 8/24/2017 By

1. HEART, LIVER, GONAD, INTESTINE
2. LIVER, INTESTINE, PANCREAS
3. SWIM BLADDER
4. GILL, EYE

MORPHOLOGIC DIAGNOSIS:

1) Body as a whole: Severe autolysis

2) Body as a whole:Multisystemic granulomas. Suspect mycobacteriosis

REMARKS: On 8/24/2017 By KAH

Autolysis in this case was severe and may have obscured relevant diagnostic lesions.

Granulomas were unusual in that they frequently contained mineral. Locations were also atypical, with the majority of lesions in the intestinal walls. However, upon acid fast staining, there are acid fast organisms in the intestinal granulomas.

Clippinger	Holder	8/24/2017
PROSECTOR	PATHOLOGIST	DATE COMPLETED

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Pathology Module - Final Pathology Report
NATIONAL ZOOLOGICAL PARK

PATH # N2017-0151

Death Date: 7/20/2017
Necropsy Date: 7/20/2017

HYLA VERSICOLOR
Grey tree frog
Name:

Sex

Gender: Unknown

Accession No.: 307342

Age:

Birth:

Acquired: 04 Aug 2011

SEX: Unknown Sex AGE: ADULT WEIGHT: 17 gm STAY:

MANNER OF DEATH:Euthanasia
TIME OF DEATH:
DEATH LOCATION:WHS
SUBMITTOR:K Hope
OWNER/ANIMAL DEPT:DOA

INTERVAL:0-6 hours
XRAYED:False
DISPOSITION:ALL IN FORMALIN
PROSECTOR:Holder

HISTORY AND CLINCICAL OBSERVATIONS:

KEEPER OBSERVATIONS: On By

CLINICIAN OBSERVATIONS: On 7/20/2017 By KLH

geriatric frog, history of intermittent bloating (GI), nematodes, and ocular lesions OU. euthanized with MS-222 IC due to recent decline in condition and poor prognosis for longterm quality of life.

GROSS DESCRIPTION: On 7/20/2017 By KAH

Presented for necropsy is a 17.0 g adult grey tree frog of unknown sex. Postmortem condition is good, and body condition is good with noticeable subcutaneous and intacoelomic fat. The interocular skin of the face has a 2 mm diameter red depression. There is abundant fluid in the coelom and scant clotted blood (likely euthanasia artifact). The lungs are markedly inflated.

The pericardium is distended with clear fluid, forming a globe approximately 1.0 cm in diameter. Between the heart and the liver there is a coiled nematod 1 mm in diameter and approximately 1 cm in length surrounded by a thin fibrous capsule.

No other gross abnormalities are noted. Histopathology is pending.

GROSS DIAGNOSIS: By KAH

Heart: Hydropericardium, severe.

Coelomic cavity: Nematodiasis.

LABORATORY STUDIES:

TISSUE STATUS:

SHELVED:	False
TRIMMED:	True
FROZEN:	False
ULTRAFROZEN:	True
Tissues Ultrafrozen:	Liver, colon and contents

SPECIAL REQUESTS: On By

HISTOLOGY: On 8/18/2017 By KAH

1. NEMATODE, LIVER, LUNG, SMALL INTESTINE, KIDNEY

2. HEART, TONGUE, LEG, SPLEEN

3. HEAD, EYES, BRAIN, FEET

MORPHOLOGIC DIAGNOSIS:

1) Whole body: Sepsis.

2) Head: Dermatitis, proliferative, necrotizing, and mixed, severe, with abundant intralesional bacteria,and subtending cellulitis and periostitis.

3) Nasal cavities: Rhinitis, mixed, severe with focal chondritis.

4) Heart: Myocarditis, heterophilic and histiocytic, locally extensive, moderate.

5) Kidney: Nephritis, lymphoplasmacytic, severe, with numerous cystic tubules.

6) Liver: Hepatitis, lymphoplasmacytic, moderate, with prominent melanomacrophage

hyperplasia.

7) Small intestine: Intraluminal nematodiasis

8) Coelom: Coelomic nematodiasis.

9) Unidentified hollow viscus: Cholesterol granuloma.

REMARKS: On 8/18/2017 By KAH

The multiorgan inflammation in this animal is consistent with sepsis. Origin is undetermined; however, the severity of the head lesions indicates that this may have been the most clinically significant and is a top contender for origin. Bacteria noted in this region are superficial and rod-shaped. These may either be primary pathogens or opportunistic invaders. It is certainly possible that the head lesion began as a traumatic wound with subsequent infection. Hydropericardium and cystic kidneys are likely linked, as kidney failure likely led to pericardial fluid accumulation.

Holder	Holder	8/18/2017
PROSECTOR	PATHOLOGIST	DATE COMPLETED

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Pathology Module - Final Pathology Report
NATIONAL ZOOLOGICAL PARK

PATH # N2017-0152

Death Date: 7/21/2017
Necropsy Date: 7/21/2017

PARACHEIRODON AXELRODI
Cardinal tetra
Name:

Sex

Gender: Unknown

Accession No.: 500808

Age:

Birth:

Acquired: 20 Oct 2014

31 Dec 2016

SEX: Unknown Sex AGE: ADULT WEIGHT: 0 gm STAY:

MANNER OF DEATH: Found Dead
TIME OF DEATH:
DEATH LOCATION: Field Station-6
SUBMITTOR: McCall
OWNER/ANIMAL DEPT: DOA

INTERVAL: 0-6 hours
XRAYED: False
DISPOSITION: ALL IN FORMALIN
PROSECTOR: Holder

HISTORY AND CLINCICAL OBSERVATIONS:

KEEPER OBSERVATIONS: On 7/21/2017 By Lm

Observed 0.0.1 Deceased Cardinal Tetra in Field Station-6. Fish was discovered on vegetation in tank. Body is complete. Some scratches observed on sides. Carcass submitted to Hospital.

CLINICIAN OBSERVATIONS: On By

GROSS DESCRIPTION: On 7/21/2017 By KAH

Received for necropsy is an adult cardinal tetra of unknown sex. The body condition is adequate and postmortem condition is moderately to severely autolyzed. No gross lesions are identified. The viscera are removed and the entire fish is preserved for histopathology.

GROSS DIAGNOSIS: By KAH

Body as a whole: autolysis

LABORATORY STUDIES:

TISSUE STATUS:

SHELVED: False

TRIMMED: True

FROZEN: False

ULTRAFROZEN: False

Tissues
Ultrafrozen:

SPECIAL REQUESTS: On By

HISTOLOGY: On 8/23/2017 By KAH

1. EYE, BRAIN, GILL, LIVER, HEAD KIDNEY, TESTIS

2. EYE, TAIL

MORPHOLOGIC DIAGNOSIS:

1) \Whole body: Severe postmortem autolysis.

2) Multiple organs: Histiocytic sheets and granulomas with intralesional spherical bodies

REMARKS: On 8/23/2017 By KAH

Autolysis in this case was severe and may have obscured relevant diagnostic lesions. Granulomatous lesions in this case included sheets of histiocytes and intralesional round bodies potentially consistent with microsporidians, as noted in other cardinal tetras from this tank. Details are obscured by autolysis, and no organisms could be identified confidently.

Holder	Holder	8/23/2017
PROSECTOR	PATHOLOGIST	DATE COMPLETED

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Pathology Module - Final Pathology Report
NATIONAL ZOOLOGICAL PARK

PATH # N2017-0153

Death Date: 7/23/2017
Necropsy Date: 7/24/2017

PARACHEIRODON AXELRODI
Cardinal tetra
Name:

Gender: Unknown Sex
Age:

Accession No.: 500808
Birth:
Acquired: 20 Oct 2014
31 Dec 2016

SEX: Unknown Sex AGE: ADULT WEIGHT: 0 gm STAY: > 30 Days

MANNER OF DEATH: Died
TIME OF DEATH: 09:00
DEATH LOCATION: Amazonia
SUBMITTOR: JCS
OWNER/ANIMAL DEPT: DOA

INTERVAL: 24-48 Hours
XRAYED: False
DISPOSITION: FORMALIN
PROSECTOR: ANC

HISTORY AND CLINCICAL OBSERVATIONS:

KEEPER OBSERVATIONS: On By

CLINICIAN OBSERVATIONS: On 7/23/2017 By JCS

Fish pulled for evaluation due to thin body condition and erratic swimming. Fish subsequently died shortly after being removed to a smaller holding tank for the exam. Previous history of thin cardinal tetras submitted to pathology with microsporidian infections found on necropsy.

GROSS DESCRIPTION: On 7/24/2017 By ANC

An adult, unknown sex, cardinal tetra is received in formalin with the ventral coelom incised on 24 July 17. The carcass is allowed to fix whole for histologic processing.

GROSS DIAGNOSIS: By ANC

No gross lesions identified (external exam only)

LABORATORY STUDIES:

TISSUE STATUS:

SHELVED:	False
TRIMMED:	True
FROZEN:	False
ULTRAFROZEN:	False

Tissues Ultrafrozen:

SPECIAL REQUESTS: On By

HISTOLOGY: On 8/14/2017 By Exemption 6

Foci of lymphohistiocytic inflammation are present throughout the skin, all viscera, skeletal system, muscle, gills, and pseudobranch. The inflammation is frequently associated with phagocytized spherical structures that vary in size from 2-6 µ and stain basophilic or amphophilic. The following tissues are histologically within normal limits: ears, eyes, and central nervous system.

MORPHOLOGIC DIAGNOSIS:

1) Skin, viscera, skeletal muscle, gills, pseudobranch: Disseminated lymphohistiocytic inflammation with intralesional parasites.

REMARKS: On 8/14/2017 By Exemption 6

This fish has a disseminated parasitic infection. These organisms are small and, in the H & E stained slide, most closely resemble Mesomycetozoa or possibly Purkinsus sp. Some special stains are pending to further characterize these organisms. This fish was still in good nutritional status and was a female.

Addendum, 08/15/17: The parasites in these tissues are gram variable, have a thin argyrophilic cell wall with GMS stain and do not stain with acid-fast technique. I am uncertain of the genus and species. These could possibly represent some form of yeast or possibly a Perkinsus organism. They do not appear to represent microsporidia. Electron microscopy and PCR would be needed to further identify these organisms.

Histology (including histopathology description, morphologic diagnoses and final comment) were performed by [redacted].

ANC	Andrew Cartoceti	8/14/2017
PROSECTOR	PATHOLOGIST	DATE COMPLETED

Pathology Module - Final Pathology Report
NATIONAL ZOOLOGICAL PARK

PATH # N2017-0154

Death Date: 7/23/2017
Necropsy Date: 7/24/2017

THAYERIA BOEHLKEI
Blackline penguin tetra
Name:

Gender: Unknown Sex
Age:

Accession No.: 500823
Birth:
Acquired: 11 Feb 2015
31 Dec 2016

SEX: Unknown Sex AGE: ADULT WEIGHT: 0 gm STAY: > 30 Days

MANNER OF DEATH: Euthanasia
TIME OF DEATH: 10:15
DEATH LOCATION: WHS
SUBMITTOR: JCS
OWNER/ANIMAL DEPT: DOA

INTERVAL: 24-48 Hours
XRAYED: False
DISPOSITION: FORMALIN
PROSECTOR: ANC

HISTORY AND CLINCICAL OBSERVATIONS:

KEEPER OBSERVATIONS: On By

CLINICIAN OBSERVATIONS: On 7/23/2017 By JCS

Penguin tetra noted to have a distended coelom by keeper staff on 7/22. Upon visual this morning was noted to have a ruptured coelom. Due to quality of life concerns euthanasia performed with MS222 overdose. Tank housing these fish known to be acid fast bacteria positive.

GROSS DESCRIPTION: On 7/24/2017 By ANC

An adult, unknown sex, penguin tetra is received whole in formalin on 24 July 2017. The carcass is allowed to fix whole to aid in histologic processing.

GROSS DIAGNOSIS: By ANC

No gross lesions identified (external exam only)

LABORATORY STUDIES:

TISSUE STATUS:

SHELVED:	False
TRIMMED:	True
FROZEN:	False
ULTRAFROZEN:	False

Tissues Ultrafrozen:

SPECIAL REQUESTS: On By

HISTOLOGY: On 8/14/2017 By [redacted]

Stomach: The stomach has severe transmural mixed inflammation, fibroplasia, and necrosis associated with overgrowth of fungi in the central lumen. The fungi are slender, hyphenated, branching, and have parallel cell walls. No pigment is observed. Fungi are not seen in the transmural inflammation in the H & E stained slide. Microgranulomas: Microgranulomas are distributed throughout the liver, mesentery, and kidney. These have a core coagulum of necrotic cellular debris surrounded by a zone of macrophages and fibroblasts. The following tissues are histologically within normal limits: musculoskeletal system, central nervous system, ears, eyes, oral and nasal cavities, gill, thyroid, ovary, small intestine, conus arteriosus, pancreas, and skin.

MORPHOLOGIC DIAGNOSIS:

1) Stomach: Transmural gastritis with luminal mycotic overgrowth
2) Multiple tissues (liver, kidney, mesentery): Granulomatosis

REMARKS: On 8/14/2017 By [redacted]

The coelomic distention noted in the history is attributed to the transmural inflammation in the stomach, and although not in the plane of section, I suspect that this was a perforating lesion. The process is associated with mycotic overgrowth in the lumen, although I was unable to identify any fungi in the transmural inflammation. I suspect these organisms are the cause for the gastritis, and a fungal stain is pending in this regard. The granulomatosis in various tissues is unrelated to the gastric lesion and resembles mycobacteriosis. An acid-fast stain is pending in this regard with an addendum to follow. This fish had adequate adipose stores and was a female.

Histology (including histopathology description, morphologic diagnoses and final comment) was performed by [redacted].

ANC	Andrew Cartoceti	8/14/2017
PROSECTOR	PATHOLOGIST	DATE COMPLETED

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Pathology Module - Final Pathology Report
NATIONAL ZOOLOGICAL PARK

PATH # N2017-0155

Death Date: 7/23/2017
Necropsy Date: 7/24/2017

ATELOPUS ZETEKI
Panamanian golden frog
Name:

Gender: Female
Age: 12Y 0M 25D

Accession No.: 307568
Birth: 28 Jun 2005
Acquired: 01 Sep 2015
Removed: 23 Jul 2017

On loan from BALTIMORE ZOO, BALTIMORE

SEX: Female AGE: 12Y 0M 25D WEIGHT: 0 gm STAY: > 30 Days

MANNER OF DEATH: Found Dead
TIME OF DEATH: 15:00
DEATH LOCATION: Demo area exhibit
SUBMITTOR: Michael Miller
OWNER/ANIMAL DEPT: DOH

INTERVAL: 6-24 hours
XRAYED: False
DISPOSITION: FORMALIN
PROSECTOR: ANC

HISTORY AND CLINCICAL OBSERVATIONS:

KEEPER OBSERVATIONS: On 7/23/2017 By MM

Noted with hind leg mobility issues on 7/17/17. Seen alive in AM check and by keeper aide working the exhibit during the course of the day. Found dead and adhered to powerhead intake at PM check.

CLINICIAN OBSERVATIONS: On By

GROSS DESCRIPTION: On 7/24/2017 By ANC

An adult, female, Panamanian golden frog is received whole in formalin with the ventral coelom incised on 24 July 2017. The carcass is allowed to fix whole in formalin to aid in histologic processing.

GROSS DIAGNOSIS: By

LABORATORY STUDIES:

TISSUE STATUS:

SHELVED:	False
TRIMMED:	True
FROZEN:	False
ULTRAFROZEN:	False

Tissues Ultrafrozen:

SPECIAL REQUESTS: On By

HISTOLOGY: On 8/7/2017 By ANC

Slide 1: Liver. Diffusely, hepatocytes contain mild amounts of clear cytoplasmic pigment (lipid). There are moderate numbers of melanomacrophages scattered throughout the hepatic parenchyma. Heart. No significant lesions (NSL). Lung. Within the lumen, there is abundant fibrillar amphophilic material. Spleen. NSL. Kidney. Some tubules contain homogenous lightly eosinophilic material (protein). Stomach. Within the lumen, there are abundant arthropods and some plant material. Cystic structure, pyloricoduodenal junction. The tissue is composed a narrow band of collagen populated by sparse spindle cells.

Slide 2: Skin, inguinal. NSL Skeletal muscle, hind limb. Scattered throughout the sample, there are occasional myofibers that are fragmented, hypereosinophilic, and degenerate.

Slide 3 with 3 deeper sections: Head in cross section with brain, pituitary, eyes, bone, skin, oral cavity, skeletal muscle, tongue, and inner ear with cochlea. NSL. Spinal column. Affecting two of the examined intervertebral spaces, there is degeneration of the articular cartilage with some fibrillation. There is proliferation of chondrocytes at the dorsal edge of the joint. In an adjacent joint there is granular lightly basophilic material present in the joint space dorsally and ventrally. In both of these joints there is some compression of the overlying spinal cord. There is no associated inflammation The overlying spinal cord is compressed and rare myelin sheaths are dilated, have lost their axons, or occasionally contain swollen axons (spheroids).

MORPHOLOGIC DIAGNOSIS:

1) Spine: Severe intervertebral degenerative joint disease with mild multifocal spinal cord Wallerian degeneration
2) Stomach: Pyloric serosal inclusion cyst
3) Liver: Mild lipid depletion
4) Skeletal muscle: Mild multifocal rhabdomyolysis

REMARKS: On 8/7/2017 By ANC

The cause of the reported hind limb weakness is likely related to the intervertebral degenerative joint disease and compression of the overlying spinal cord; however, a definitive cause of death is not identified histologically. Potential causes of death with minimal histologic evidence include septicemia, cardiac arrhythmia, or seizure. In amphibians, a common gross finding of septicemia (otherwise known as red leg) is cutaneous erythema; the red-orange areas in the inguinal regions may represent this disease process. Septicemia can be caused by several species of bacteria, including Aeromonas hydrophila, Salmonella sp. or other Gram-negative bacilli. Alternatively, the red-orange areas may represent the pelvic patches, which frequently have different coloration than the surrounding skin and may represent species-specific coloration. The amount of hepatic lipid is slightly decreased in comparison to what is expected, and is likely representative of negative energy balance, and is a non-specific finding. The cause of the rhabdomyolysis is not identified, and the lesion is not consistent with neurogenic atrophy. The cyst arising from the pyloricoduodenal junction is a serosal inclusion cyst, an uncommon incidental finding.

Histology, including the above comment, histologic findings and morphologic diagnoses, was provided by [redacted]. Orange-red coloration of the ventral hindlimb skin is normal species coloration. Rhabdomyolysis is interpreted as a postmortem artifact which is commonly seen in amphibian histology.

ANC	ANC	8/7/2017
PROSECTOR	PATHOLOGIST	DATE COMPLETED

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Pathology Module - Final Pathology Report
NATIONAL ZOOLOGICAL PARK

PATH # N2017-0156

Death Date: 7/24/2017
Necropsy Date: 7/24/2017

BOS TAURUS TAURUS_HOLSTEIN	Gender: Female	Accession No.: 113881
Holstein cow	Age: 13Y 6M 29D	Birth: 25 Dec 2003
Name: Tulip	Chip: 4B15365F11	Acquired: 08 Apr 2004
		Removed: 24 Jul 2017

SEX: Female	AGE: 13Y 6M 29D	WEIGHT: 770 kg	STAY: > 30 Days
MANNER OF DEATH: Euthanasia			INTERVAL: 0-6 hours
TIME OF DEATH: 13:00			XRAYED: False
DEATH LOCATION: Kid's farm			DISPOSITION: INCINERATE
SUBMITTOR: JCS			PROSECTOR: ANC
OWNER/ANIMAL DEPT: DOM - Kids' Farm			

HISTORY AND CLINCICAL OBSERVATIONS:

KEEPER OBSERVATIONS: On By

CLINICIAN OBSERVATIONS: On 7/24/2017 By JCS

Chronic history of anemia of chronic disease with acute worsening noted over the last two weeks. Recent PCV was 19% on 7/20. Treated with oxytetracyline and IV banamine with limited success. Exam today revealed acute worsening with total anorexia, lethargy, and inability to stand. Exam showed decreased ruminal contractions, profoundly enlarged bladder, inability to stand, and pale mucus membranes. Due to concerns for quality of life euthanasia performed after IM xylazine with IV euthasol. Suspect either neoplasia or chronic abomasitis/rumenitis with blood loss into the GI tract.

GROSS DESCRIPTION: On 7/24/2017 By ANC

A 770 kilogram, intact female holstein cow is necropsied on 24 July 2017. The carcass is in good postmortem condition and good nutritional state with well-fleshed muscles and adequate subcutaneous and intra-abdominal adipose stores. In the subcutis of the left axilla and the left hip, there are three masses up to ~ 5 cm in diameter that have a thick, white, fibrous wall and contain abundant thick yellow exudate (abscesses). Within the parenchyma of all lung lobes, there are dozens of firm, white, nodules up to 4 cm in diameter (right caudal lobe). The visceral pleura overlying nodules is white, stellate and contracted and the pulmonary lobules surrounding nodules is red and collapsed. On cut section, pulmonary nodules consist of firm, white, tissue with miliary pale yellow stippling that occasionally ooze thick yellow material. The tracheobronchial lymph nodes are enlarged, firm and mottled pink to white on cut section. The forestomachs are filled with abundant, moderately dry, fibrous, green ingesta. The mucosa of the proximal jejunum is diffusely reddened. The colon contains formed feces. Within the mesenteric fat of the small and large intestine, there are few well-demarcated, firm, pale yellow nodules that on cut section are composed of white to pale yellow, finely stippled tissue that is incompletely circumscribed by thin white trabecular bands. The urinary bladder is empty and contracted. The tongue, brain, trachea, esophagus, heart, liver, gallbladder, spleen, kidneys, adrenal glands, ovaries and uterus were grossly unremarkable.

GROSS DIAGNOSIS: By ANC

Lung: Multiple masses (ruleout chronic pneumonia versus neoplasia)
Lymph node, tracheobronchial: Lymphadenomegaly
Subcutis, left axilla and hip: Multiple chronic abscesses
Mesenteric adipose: Multiple masses (ruleout necrotic fat versus lymphadenomegaly)
Jejunum: Diffuse mucosal hyperemia/congestion
Body as a whole: Good body condition

LABORATORY STUDIES:

CULTURE:	Axillary abscess, pulmonary nodules
CYTOLOGY:	Lung masses
OTHER:	Lung mass swab, mesenteric lymph node/fat swab @ 4 C

TISSUE STATUS:

SHELVED:	False
TRIMMED:	True
FROZEN:	False
ULTRAFROZEN:	True
Tissues Ultrafrozen:	liver, kidney, lung, axillary abscess, tracheopbronchial lymph node, mesenteric lymph node/fat

SPECIAL REQUESTS: On By

HISTOLOGY: On 8/17/2017 By ANC

1. TRACHEOBRONCHIAL LYMPH NODE
2. TRACHEOBRONCHIAL LYMPH NODE
3. MESENTERIC ADIPOSE
4. LUNG
5. LUNG
6. LUNG
7. LUNG; SPLEEN
8. THYROID; ADRENAL; LYMPH NODE, TRACHEOBRONCHIAL
9. KIDNEY
10. LIVER; GALLBLADDER
11. HEART
12. HEART
13. RUMEN; RETICULUM; INTESTINE
14. JEJUNUM; ILEUM
15. INTESTINE; OVARY
16. PANCREAS; DUODENUM; UTERUS
17. URINARY BLADDER; OVARY
18. ESOPHAGUS
19. SUBCUTIS
20. BRAIN
21. BRAIN
22. BRAIN
23. BRAIN
24. BRAIN
25. BRAIN
26. BRAIN
27. PITUITARY GLAND

MORPHOLOGIC DIAGNOSIS:

1) Lung: Pulmonary adenocarcinoma with intrapulmonary metastasis
2) Lymph node, tracheobronchial: Metastatic carcinoma
3) Adipose (mesenteric): Moderate to severe, regionally extensive, chronic, lymphohistiocytic steatitis with necrosis, saponification and fibrosis
4) Subcutis: Multifocal, chronic, suppurative cellulitis with abscessation
5) Kidney: Mild, multifocal, chronic, lymphoplasmacytic interstitial nephritis and mild medullary interstitial mineralization
6) Small and large intestine: Mild, diffuse, eosinophilic enterocolitis
7) Blood vessels, brain: Regionally extensive, circumferential, tunica media mineralization
8) Heart: Minimal, multifocal, chronic, lymphocytic myocarditis

REMARKS: On 8/17/2017 By ANC

8/17/17: Histology revealed a high grade and aggressively metastasizing pulmonary carcinoma as the cause of the lung masses, tracheobronchial lymph node enlargement and clinical signs. Lung lesions were negative for bacterial and fungal growth via aerobic cultures and negative for acid-fast bacteria on cytology. Subcutaneous abscessation is most likely due to bacterial contamination at injection sites, although bacteria were no longer demonstrable via histology or cultures. Firm masses within abdominal fat are due to adipose necrosis, saponification and fibrosis. Small intestinal reddening noted grossly was represented histologically by mucosal congestion, and is considered incidental. The remaining diagnoses are considered mild and clinically insignificant.

ANC	CARTOCETI	8/17/2017
PROSECTOR	PATHOLOGIST	DATE COMPLETED

Printed on: 8/17/2017 9:13:13 AM CARES-MED v2.119

Pathology Module - Final Pathology Report
NATIONAL ZOOLOGICAL PARK

PATH # N2017-0157

Death Date: 7/24/2017
Necropsy Date: 7/24/2017

MUSTELA NIGRIPES
Black-footed ferret
Name: Babadook

Gender: Female

Age: 3Y 0M 28D

Chip: 026 282 090

Accession No.: 115103

Birth: 26 Jun 2014

Acquired: 26 Jun 2014

Removed: 24 Jul 2017

SEX: Female	AGE: 3Y 0M 28D	WEIGHT: 797 gm	STAY: > 30 Days
MANNER OF DEATH:	Found Dead	INTERVAL:	6-24 hours
TIME OF DEATH:		XRAYED:	False
DEATH LOCATION:	SCBI-F22	DISPOSITION:	INCINERATE
SUBMITTOR:	Vicki Lake	PROSECTOR:	KAH
OWNER/ANIMAL DEPT:	DCO		

HISTORY AND CLINCICAL OBSERVATIONS:

KEEPER OBSERVATIONS: On 7/24/2017 By VL

Housed indoors in an environmentally controlled area with 1.1 offspring (115562,115563). Dam had no abnormal diet changes.

Brief history: Individual whelped 6 kits on 23 April 2017, (acc #115474-479). Per protocol the nest box was not opened but squeaks were heard indicating she had whelped. One kit was found deceased on 27 April 2017. Female and remaining kits examined, female was found to have a vaginal infection. Despite treatment remaining kits were all deceased by 29 April 2017 . This female finished out her treatment and a re-culture did not turn up any remaining infection. She was re-bred and subsequently whelped again on 22 June 2017. On 28 June 2017 her kits were noted to be smaller than normal for their age and kits 115564 and 115565 had sores on their abdomens. The sores were cultured and later found to be e. coli. Despite treatment of female and all her kits, kit 115565 had to be euthanized on 29th June 2017. The three remaining kits had started to gain weight. They finished their treatment. Two days after treatment finished one of the kits, 115564, started loosing weight. He started treatment again but continued to loose weight and was euthanized on 08 July 2017. The remaining kits (115562-563) and dam appeared normal. The kits continued to grow and develop normally.

7/24/17 115103 was found lying on her left side in the right rear corner of her enclosure. She was stiff and cold to the touch but her two kits were bright, alert and responsive lying together in their den box. They were all observed at 1800 yesterday (7/23/17) with no issues.

Additional Comments/KHelmick:

Kits 115564 (histology pending), 115565 (histology findings consistent with E coli septicemia) deceased. Two living kits (115562/563)completed treatment for pustular

dermatitis. Today kit 115563 developed acute swelling OD with accumulation of purulent material under eyelids/eyelids still sealed at this age. Cytology/culture pending, suspect E coli.

This deceased female also completed a course of antibiotics early July with no symptoms/concerns at recheck exams. Vaginal swab obtained 4/28/2017 POSITIVE FOR CFN1: CYTOTOXIC NECROTIZING FACTOR 1. ASSOCIATED WITH NECROTOXIGENIC E. COLI (NTEC).

Please culture heart or liver blood in addition to other lesions necessary and submit for E coli identification.

CLINICIAN OBSERVATIONS: On By

GROSS DESCRIPTION: On 7/24/2017 By KAH

Presented for necropsy is an adult intact female black footed ferret weighing 797 g. The postmortem condition is mildly autolyzed, and body condition is good with noticeable intra-abdominal fat and excellent muscling. Transponder number is confirmed as 026-282-090. The stomach contents are a watery, yellow, mucoid fluid. Colon contents are scant, unformed feces.

There is mild to moderate, red-tinged gelatinous edema in the abdominal subcutis. The heart is mildly rounded.

GROSS DIAGNOSIS: By KAH

Moderate autolysis

Subcutis: Mild to moderate subcutaneous edema.

LABORATORY STUDIES:

TISSUE STATUS:

SHELVED:	False
TRIMMED:	True
FROZEN:	False
	True

ULTRAFROZEN:

Tissues Ultrafrozen: liver kidney heart colon&contents

SPECIAL REQUESTS: On By

HISTOLOGY: On 8/23/2017 By KAH

1. NOSE, EYE

2. EYE, HEART, TONGUE

3. KIDNEY, LIVER, SPLEEN

4. LUNG, ADRENAL, UTERUS

5. INTESTINE, STOMACH, MAMMARY

6. BRAIN

7. FAT

MORPHOLOGIC DIAGNOSIS:

1) Mammary: Mastitis, histiocytic, with intralesional bacteria.

2) Abdominal cutaneous lymphatics: Abundant intraluminal bacilli.

3) Lung: Bronchial hemorrhage.

4) Lung: Interstitial pneumonia.

5) Small intestine: Enteritis, lymphocytic and suppurative, moderate.

6) Gall bladder: Villous hyperplasia and abundant bacteria in mucus of lumen.

7) Eye: Conjunctivitis, lymphocytic, mild,

8) Lung: Pneumoconiosis, moderate.

9) Liver: Extramedullary hematopoiesis.

10) Liver: Ito cell hyperplasia.

REMARKS: On 8/23/2017 By KAH

Given the history of E. coli sepsis in this dam's kits, there is a high suspicion that she was a carrier of virulent cytotoxic/necrotoxigenic E. coli. While histological signs of sepsis are subtle in this case, the presence of abundant bacilli in mammary tissue and surrounding lymphatics is highly suggestive of both the route of transmission to kits and the possible focus of this animal's infection. This is also

consistent with the grossly noted ventral abdominal edema, likely secondary to bacterial damage of lymphatics.

KAH	Holder	8/23/2017
PROSECTOR	PATHOLOGIST	DATE COMPLETED

Printed on: 8/23/2017 10:41:54 AM CARES-MED v2.119

Pathology Module - Final Pathology Report
NATIONAL ZOOLOGICAL PARK

PATH # N2017-0158

Death Date: 7/24/2017
Necropsy Date: 7/25/2017

MACROSCELIDES PROBOSCIDEUS
Short-eared elephant shrew
Name: Penelope

Gender: Male
Age: 3Y 2M 16D

Accession No.: 115041
Birth: 08 May 2014
Acquired: 08 May 2014
Removed: 24 Jul 2017

On loan from PHILADELPHIA ZOOLOGICAL GARDEN, PHILADELPHIA

SEX: Male	AGE: 3Y 2M 16D	WEIGHT: 0 gm	STAY: > 30 Days
MANNER OF DEATH: Euthanasia		INTERVAL: 0-6 hours	
TIME OF DEATH: 13:30		XRAYED: False	
DEATH LOCATION: WHS		DISPOSITION: INCINERATE	
SUBMITTOR: JCS		PROSECTOR: ANC	
OWNER/ANIMAL DEPT: DOM - SMH			

HISTORY AND CLINCICAL OBSERVATIONS:

KEEPER OBSERVATIONS: On By

CLINICIAN OBSERVATIONS: On 7/24/2017 By JCS

Recent history of right hock swelling that resolved without treatment. Curator noted acute onset of lethargy with 18% body weight loss in a week. Physical exam at WHS showed increased bronchovesicular sounds bilaterally more severe on the left side versus the right, long overgrown nails, and unkempt appearance. Radiographs showed diffuse soft tissue opacities throughout both lung fields with the left being worse than the right and diffuse gas dilation in the GI tract. Due to concerns for quality of life and age of the animal euthanasia performed via intracardiac injection of euthasol and potassium chloride.

GROSS DESCRIPTION: On 7/26/2017 By ANC

A 32.1 gram (wet), intact male, short-eared elephant shrew is necropsied on 25 July 2017 following euthanasia. The carcass is in fair postmortem condition (discoloration and partial liquefication some viscera) and poor body condition with minimal adipose stores. The nails are markedly overgrown on all feet. The skin of the entire tail is dry and irregularly thickened. The lungs are diffusely pale red-brown with a subtle reticular pattern and sink in formalin. The stomach contains a small amount of granular brown material. The small intestine contains gas and scant pasty brown ingesta, and the proximal colon contains formed fecal balls. The eyes, brain, heart, liver, kidneys, adrenal glands, testis, urinary bladder and skeletal muscle are grossly unremarkable.

GROSS DIAGNOSIS: By ANC

Lungs: Severe diffuse bilateral pneumopathy
Fore and hindfeet: Marked nail overgrowth
Tail: Mild, diffuse, epidermal thickening
Body as a whole: Poor body condition

LABORATORY STUDIES:

TISSUE STATUS:

SHELVED:	False
TRIMMED:	True
FROZEN:	False
ULTRAFROZEN:	True

Tissues Ultrafrozen: Lung, liver

SPECIAL REQUESTS: On By

HISTOLOGY: On 8/16/2017 By ANC

1. KIDNEY; ADRENAL; TESTIS
2. LIVER; LUNG
3. BRAIN
4. TONGUE; TRACHEA; ESOPHAGUS; THYROID; STOMACH; DUODENUM; PANCREAS; JEJUNUM; ILEUM; CECUM; COLON; CECAL LYMPH NODE
5. HEAD, EYES, NASAL CAVITY
6. TAIL

SPECIAL STAINS
2. GMS, Warthin Starry, Ziehl Neelsen, Mucicarmine: Rare round yeast with mucicarmine staining capsules

are present in alveoli and bronchi.

MORPHOLOGIC DIAGNOSIS:

1) Nasal cavity, choana: Catarrhal rhinitis with abundant, intraluminal, encapsulated yeast (consistent with Cryptococcus sp.)
2) Lung: Moderate, multifocal, chronic, histiocytic pneumonia
3) Lung: Diffuse, intra-alveolar proteinaceous fluid/debris (possible euthanasia artifact)
4) Lymph node: Moderate, multifocal, chronic, histiocytic lymphadenitis
5) Tongue, esophagus: Mild, multifocal, chronic, lymphoplasmacytic glossitis and esophagitis with intracorneal yeasts and pseudohyphae (presum. Candida)
6) Skin, tail: Diffuse orthokeratotic hyperkeratosis
7) Adipose: Diffuse atrophy
8) Testis: Spermatogenesis

REMARKS: On 9/1/2017 By ANC

9/1/17 (Addendum): Special stains revealed Cryptococcus organisms in the lungs, confirming infection of the lower (as well as upper) respiratory tract by this fungus.

8/16/17: Respiratory distress is due to infection of the upper respiratory tract by Cryptococcus fungus. There is minimal cellular inflammatory response to yeast in the nasal cavity, a common finding in Cryptococcus infection. Histiocytic pneumonia may be a sequela of fungal infection and impaired respiration. Non-infectious causes of pneumonia also include histiocytosis resulting from immune dysregulatory diseases. Likewise, the flooding of alveoli with proteinaceous fluid may be a consequence of infection, although there is considerable euthanasia artifact obscuring most of the architecture of the lungs (and liver), which could both produce this change artifactually and mask intrapulmonary organisms. Special stains to rule out the presence of pulmonary microorganisms (Cryptococcus, Pneumocystis) are pending. Candida infection of the tongue is likely secondary in a debilitated animal. Hyperkeratosis of the tail is a non-specific finding; there is no evidence of accompanying inflammation, infection, or parasitism and this change may be due to low environmental humidity.

ANC	Andrew Cartoceti	9/1/2017
PROSECTOR	PATHOLOGIST	DATE COMPLETED

Printed on: 9/1/2017 3:42:12 PM CARES-MED v2.119

Pathology Module - Final Pathology Report
NATIONAL ZOOLOGICAL PARK

PATH # N2017-0159

Death Date: 7/25/2017
Necropsy Date: 7/25/2017

EQUUS CABALLUS PRZEWALSKII
Przewalski's wild horse
Name: Minnesota

Gender: Male
Age: 29Y 3M 15D
Chip: unknown #

Accession No.: 113916
Birth: 10 Apr 1988
Acquired: 30 Jun 2005
14 Apr 2014
Removed: 25 Jul 2017

SEX: Male | AGE: 29Y 3M 15D | WEIGHT: 266 kg | STAY: > 30 Days

MANNER OF DEATH: Euthanasia
TIME OF DEATH: 07:45
DEATH LOCATION: P horse yard
SUBMITTOR: KLH
OWNER/ANIMAL DEPT: DOM - SMH

INTERVAL: 0-6 hours
XRAYED: False
DISPOSITION: INCINERATE
PROSECTOR: ANC

HISTORY AND CLINCICAL OBSERVATIONS:

KEEPER OBSERVATIONS: On By

CLINICIAN OBSERVATIONS: On 7/25/2017 By KLH

Recent signficant weight loss and muscle atrophy, mild anemia, otherwise acting normally. Did not respond to increased diet and dental floating, and given age and history, decided to pursue humane euthanasia vs extensive diagnostics or therapeutics.

- intermittent diarrhea over past 1.5 years (not recently)
- mild dental disease, teeth floated at exam a few weeks ago.
- episode of epistaxis ~6 weeks ago
- intermittent history of strongyles
- Anaplasma phagocytophilum dx and treated in 2009
- history of sarcoid on his penis ~5 years ago--resolved
- vasectomy (successfully reversed in 2007)

GROSS DESCRIPTION: On 7/26/2017 By ANC

A 266 kilogram, intact male, Przewalski's horse is necropsied on 25 July 2017 following euthanasia. The carcass is in excellent postmortem condition and poor to fair body condition with generalized muscle atrophy, exaggeration of ribs and bony prominences and small subcutaneous and intra-abdominal adipose stores. The subcutis and fascia are diffusely slightly yellowed. The lungs are diffusely pink with few small dark red, soft foci (presumed agonal hemorrhage). In the right cranial lung lobe, there is a 1 cm diameter, firm, white nodule. Within the superficial myocardium and papillary muscle of the left ventricular wall, there is multifocal irregular to linear soft, pale yellow mottling. There are few fibrin tags on the capsule of the liver and on cut section the parenchyma has a subtle reticular pattern. In the left lateral liver lobe, one vessel/bile duct has a prominent and thickened wall (2-3 mm thick). In the glandular and non-glandular portions of the gastric mucosa, there are dozens of depressions that are pale to dark red (largest up to 2 x 1 cm in the glandular portion). The jejunum contains watery to mucoid yellow-green contents. The wall of the ileum is contracted and slightly thickened. Within the lumen of the large colon, there is abundant (~2+ liters) of fine and coarse sand. The meninges are diffusely slightly thickened, wet and translucent. Within the articular cartilage of the appendicular joints, there are mild linear excoriations, most prominent in the talus. The left stifle joint has increased yellow joint fluid with soft, flocculent white material. Bone marrow is diffusely yellow and gelatinous. The mucosa of the left maxillary sinuses is markedly thickened, gelatinous and dark red to yellow. Within the caudal recess of the adjacent left nasal cavity, there is a ~1 x 0.5 x 0.3 cm aggregate of soft to firm, friable dark green material. There is marked uneven wear of all cheek teeth (wave mouth), with some teeth worn almost to the level of the gingiva. The eyes, trachea, esophagus, spleen, thyroid glands, adrenal glands, kidneys, urinary bladder, penis, testes and skeletal muscle are grossly unremarkable.

GROSS DIAGNOSIS: By ANC

Teeth: Severe dental attrition with malocclusion
Large colon: Abundant sand ingesta
Stomach: Moderate, multifocal, glandular and non-glandular mucosal erosions/ulcerations
Sinus, left maxillary: Moderate, diffuse, catarrhal sinusitis (presumptive)
Small intestine: Abundant mucoid contents
Subcutis, fascia: Mild, diffuse icterus
Joints, appendicular: Mild degenerative joint disease with cartilage excoriations
Lung: Focal nodule
Body as a whole: Poor to fair body condition with generalized muscle atrophy

LABORATORY STUDIES:
CULTURE: Left maxillary sinuse - aerobic and fungal

CYTOLOGY: Spleen impressions
OTHER: Testes to repro.

TISSUE STATUS:

SHELVED:	False
TRIMMED:	True
FROZEN:	False
ULTRAFROZEN:	True

Tissues Ultrafrozen: Lung, liver (2), kidney, SI contents

SPECIAL REQUESTS: On 7/25/2017 By KLH

Check with repro if they need testes or repro tract.

HISTOLOGY: On 8/28/2017 By ANC

1. LUNG WITH NODULE
2. LUNG WITH PLEURAL THICKENING; ADRENAL
3. LIVER; SPLEEN
4. ADRENAL; THYROID; PANCREAS; PENIS LYMPH NODE
5. KIDNEY
6. HEART; BONE MARROW
7. HEART; URINARY BLADDER
8. STOMACH
9. STOMACH; LARGE INTESTINE
10. SMALL and LARGE INTESTINE
11. SMALL and LARGE INTESTINE
12. SMALL and LARGE INTESTINE
13. SMALL and LARGE INTESTINE
14. TRACHEA; ESOPHAGUS; STOMACH
15. LEFT MAXILLARY PARANASAL SINUS
16. NASAL EXUDATE
17. BRAIN
18. BRAIN
19. BRAIN
20. BRAIN
21. BRAIN
22. BRAIN
23. BRAIN

SPECIAL STAINS
1. Brown & Hopps: Bacteria were not evident in the inflamed focus of lung.
1. Periodic Acid Schiff (w/ and w/o diastase): Neoplastic cells have many PAS-positive cytoplasmic granules that resist diastase digestion.
7. Periodic Acid Schiff (w/ and w/o diastase): Approximately one third of neoplastic cells have many PAS-positive cytoplasmic granules that resist diastase digestion.
16. GMS: Fungal hyphae are septate, with non-parallel walls and branching.

IMMUNOHISTOCHEMISTRY
4. CD3: Neoplastic cells in lymph node sinuses and blood vessels have strong, diffuse, cytoplasmic immunoreactivity.
4. CD18: Neoplastic cells have no immunoreactivity.
4. CD20: Neoplastic cells in lymph node sinuses and blood vessels have strong, diffuse, cytoplasmic immunoreactivity.

MORPHOLOGIC DIAGNOSIS:

1) Liver, spleen, lymph node: Lymphosarcoma/leukemia
2) Peripheral blood: Intravascular lymphosarcoma/leukemia
3) Stomach: Severe, multifocal, chronic, neutrophilic and ulcerative gastritis with mucosal fibrosis and superficial fungal colonization
4) (A) Paranasal sinus, maxillary: Severe, regionally extensive, lamina proprial edema and lymphangiectasia with mild, neutrophilic sinusitis and
4) (B) intraluminal fungal mat and bacteria
5) Heart: Multifocal to regionally extensive aterio- and arteriolosclerosis with myocardial vacuolation atrophy and replacement fibrosis
6) Heart: Focal neoplasm (suspect granular cell tumor, see comment)
7) Lung: Granular cell tumor
8) Lung: Mild, multifocal, acute, neutrophilic bronchopneumonia with alveolar hemorrhage, edema and fibrin exudation
9) Pancreas: Moderate, diffuse zymogen granule depletion
10) Pancreas: Mild, multifocal, neutrophilic, interlobular dochitis
11) Large intestine: Mild, multifocal, eosinophilic colitis
12) Lung: Focally extensive pleural fibrosis

REMARKS: On 8/28/2017 By ANC

10/3/17 (Addendum): Immunohistochemistry confirmed the diagnosis of lymphosarcoma/leukemia; however,

neoplastic cells express both CD3 and CD20, precluding differentiation of these cells as T-cell versus B-cell origin. The staining characteristics (PAS-positivity with diastase resistence) of neoplastic cells in the lung and heart is continues to support a diagnosis of granular cell tumor in both locations. This concludes all diagnostic testing.

9/1/17 (Addendum): Fungal morphology is suggestive of a zygomycete fungus, such as Conidiobolus sp., Mucor sp. etc.

8/28/17: The histologic findings are consistent with lymphosarcoma/leukemia. At this late stage of progression, it cannot be determined if disease began as lymphosarcoma and progressed to a leukemic phase, or vice versa. Examined sections of bone marrow consisted entirely of adipose, likely due to the sample location. Several of the histologic findings (splenic and hepatic sinusoidal lymphoma with erythrophagocytosis), hematologic abnormalities (anemia, thrombocytopenia, hyperbilirubinema) and clinical findings are reminiscent of hepatosplenic lymphoma, which is an unusual type of lymphoma that does not form discrete masses and is under-reported in domestic equids in the literature (1). Although some features of this case (the presence of neoplastic cells in the lymph nodes and peripheral blood) are uncommon for hepatosplenic lymphoma. Immunohistochemistry to confirm this diagnosis and type the lymphoma (typically T-cell) is being pursued. The nodule within the left cranial lung lobe is small granular cell tumor, an incidental disease that is occassionally found in aged domestic equids. The mass within the myocardium also resembles a granular cell tumor, although these tumors are reported to be confined to the lung in equids, but can occur in the heart of other species. Immunohistochemistry to attempt to confirm this diagnosis is being pursued. Additional degenerative myocardial lesions are presumed to be the result of sclerosing vasculopathy causing myocardial degeneration and fibrosis. Sinusitis was confirmed on histology and appears to be due to a combination of Klebsiella pneumoniae bacteria and fungi infection. Fungus could not be cultured from a swab of the nasal fungal mat; special stain to further characterize hyphal morphology is pending. Fungal infection is presumptively the cause of prior epistaxis. Pneumonia is presumed to be a sequela of either infectious sinusitis or aspiration in a terminally ill animal.

(1) Roccabianca P, Paltrinieri S, Gallo E, Giuliani A. Hepatosplenic T-cell lymphoma in a mare. Vet Pathol. 2002 Jul;39(4):508-11.

ANC	Andrew Cartoceti	8/28/2017
PROSECTOR	PATHOLOGIST	DATE COMPLETED

Pathology Module - Final Pathology Report
NATIONAL ZOOLOGICAL PARK

PATH # N2017-0160

Death Date: 7/27/2017
Necropsy Date: 7/27/2017

CORYDORAS PANDA
Panda catfish
Name:

Gender: Unknown Sex
Age:

Accession No.: 500838
Birth:
Acquired: 08 Apr 2015
31 Dec 2016

SEX: Unknown Sex AGE: ADULT WEIGHT: 5.3 gm STAY: > 30 Days

MANNER OF DEATH: Found Dead
TIME OF DEATH: 08:02
DEATH LOCATION: Bottom of tank. FSA9
SUBMITTOR: Lando McCall
OWNER/ANIMAL DEPT: DOA

INTERVAL: 0-6 hours
XRAYED: False
DISPOSITION: FORMALIN
PROSECTOR: ANC

HISTORY AND CLINCICAL OBSERVATIONS:

KEEPER OBSERVATIONS: On 7/27/2017 By LM

Keeper found deceased fish at bottom of tank during AM feed. No observable injuries or wounds. Body intact. Tank FSA-9 in Field Station.

CLINICIAN OBSERVATIONS: On By

GROSS DESCRIPTION: On 7/27/2017 By ANC

A 5.3 gram, unknown sex, panda cory is received on 27 July 2017. The carcass is in good postmortem condition and the coelom contains obvious adipose. The fish is placed whole in formalin following incision of the ventral coelom.

GROSS DIAGNOSIS: By ANC

No signficant external lesions identified

LABORATORY STUDIES:

TISSUE STATUS:

SHELVED:	False
TRIMMED:	True
FROZEN:	False
ULTRAFROZEN:	False

Tissues Ultrafrozen:

SPECIAL REQUESTS: On By

HISTOLOGY: On 8/14/2017 By [redacted]

Foci of lymphohistiocytic inflammation with occasional organization into granulomas are present throughout the facial soft tissues, gills, heart, kidney, swim bladder, ovary, mesentery, spleen, skeletal muscle, eyes, brain, oral mucosa, and meninges. These lesions are occasionally associated with what appears to be some bacterial emboli. Gas emboli: Gas emboli are present mesentery, spleen, liver, and facial soft tissues. The following tissues are histologically within normal limits: ears and nasal cavity.

MORPHOLOGIC DIAGNOSIS:

1) Multiple organs: Disseminated lymphohistiocytic inflammation with possible bacterial embolization and granulomatosis

REMARKS: On 8/14/2017 By [redacted]

Histologic findings are consistent with a disseminated infectious disease process. Mycobacteriosis is an important differential, and an acid-fast stain is pending in this regard with an addendum to follow. The gas embolization in this case is most likely due to abrogation of the swim bladder due to the inflammatory process in the bladder wall. This fish was in good nutritional status and was a female.

Addendum, 08/15/17: A Fite's acid-fast stain identifies large numbers of acid-fast bacilli within foci of inflammation. This result is diagnostic for mycobacteriosis. Culture and/or PCR would be needed to further identify the species. These procedures are best performed from frozen tissue, although the PCR can be performed from paraffin-embedded tissue with less sensitivity. Please notify the laboratory if you would like PCR attempted from the paraffin block (block #2).

Histology (including histopathology description, morphologic diagnoses and final comment) were performed by [redacted].

ANC	Andrew Cartoceti	8/14/2017
PROSECTOR	PATHOLOGIST	DATE COMPLETED

Printed on: 8/16/2017 7:51:12 AM CARES-MED v2.119

Pathology Module - Final Pathology Report
NATIONAL ZOOLOGICAL PARK

PATH # N2017-0161

Death Date: 7/27/2017
Necropsy Date: 7/27/2017

LANIUS LUDOVICIANUS MIGRANS
Loggerhead shrike
Name:

Gender: Unknown Sex
Age: 0Y 3M 23D

Accession No.: 216583
Birth: 04 Apr 2017
Acquired: 04 Apr 2017
Removed: 27 Jul 2017

SEX: Unknown Sex AGE: 0Y 3M 23D WEIGHT: 54.2 gm STAY:

MANNER OF DEATH: Found Dead
TIME OF DEATH: 07:45
DEATH LOCATION: SCBI, SAF S-N
SUBMITTOR: Chris Crowe
OWNER/ANIMAL DEPT: DCO

INTERVAL: 0-6 hours
XRAYED: False
DISPOSITION: INCINERATE
PROSECTOR: ANC

HISTORY AND CLINCICAL OBSERVATIONS:

KEEPER OBSERVATIONS: On 7/27/2017 By CC

-Housed outdoors with 0.0.2 juvenile same age conspecific siblings.
-Weather mild (high of mid 80's).
-No known health problems.
-No cagemate aggression previously observed.
-Found dead lying sternal on ground in rear of pen at 0745. No obvious trauma, but bird missing feathers from most of head.

CLINICIAN OBSERVATIONS: On By

GROSS DESCRIPTION: On 7/28/2017 By ANC

A 54.2 gram, juvenile, male Loggerhead shrike is necropsied on 27 July 2017 following being found dead. The carcass is in good postmortem condition and good body condition with well-fleshed pectoral muscles and adequate subcutaneous and intra-coelomic adipose stores. A metal band on the left leg reads 2491 04323. The feathers are absent over the majority of the dorsal skull and the exposed skin is multifocally mildly to moderately reddened. There is hemorrhage into the intraosseous space of the calvarium. The ventriculus contains small amounts of granular material. The small intestine contains pasty yellow-brown ingesta and the colon is empty. The eyes, brain, trachea, esophagus, lungs, heart, liver, spleen, kidneys, adrenals, thyroids, testes, proventriculus, ventriculus, duodenum, pancreas, jejunum, ileum, ceca, colon and skeletal muscle are grossly unremarkable.

GROSS DIAGNOSIS: By ANC

Skin, dorsal/occipital head: Regional feather loss with dermal congestion/hemorrhage
Body as a whole: Good body condition

LABORATORY STUDIES:

TISSUE STATUS:

SHELVED:	False
TRIMMED:	True
FROZEN:	False
ULTRAFROZEN:	True

Tissues Ultrafrozen: Liver (2)

SPECIAL REQUESTS On By

HISTOLOGY: On 8/16/2017 By ANC

1. BRAIN
2. LIVER; KIDNEY; SPLEEN; LUNG
3. HEART; PECTORAL MUSCLE; TRACHEA; ESOPHAGUS; UROPYGIAL GLAND
4. STOMACH; DUODENUM; PANCREAS; SMALL INTESTINE; COLON; CLOACAL BURSA
5. HEAD, EYES, NASAL CAVITY

MORPHOLOGIC DIAGNOSIS:

1) Uropygial gland: Moderate, chronic, heterophilic adenitis with intraductal keratin and bacteria
2) Cloaca: Mild, multifocal, chronic, heterophilic cloacitis
3) Oral cavity: Mild, focally extensive, chronic, lymphoplasmacytic stomatitis
4) Small intestine: Segmental proprial edema
5) Lung: Bronchial-associated lymphoid hyperplasia

REMARKS: On 8/16/2017 By ANC

8/16/17: Bacterial infection of the central canal of the uropygial gland is significant, but is unlikely to be the major contributor to death. The remaining findings are mild and less clincally significant. In the absence of more serious disease, acute trauma remains a top differential for sudden death in this shrike.

ANC	Andrew Cartoceti	8/16/2017
PROSECTOR	PATHOLOGIST	DATE COMPLETED

Printed on: 8/16/2017 2:39:40 PM CARES-MED v2.119

Pathology Module - Final Pathology Report
NATIONAL ZOOLOGICAL PARK

PATH # N2017-0162

Death Date: 7/28/2017
Necropsy Date: 7/28/2017

PARACHEIRODON AXELRODI
Cardinal tetra
Name:

Gender: Unknown Sex
Age:

Accession No.: 500808
Birth:
Acquired: 20 Oct 2014
31 Dec 2016

SEX: Unknown Sex AGE: ADULT WEIGHT: 0 gm STAY: > 30 Days

MANNER OF DEATH: Euthanasia
TIME OF DEATH: 10:00
DEATH LOCATION: WHS
SUBMITTOR: Kendra Bauer
OWNER/ANIMAL DEPT: DOA

INTERVAL: 0-6 hours
XRAYED: False
DISPOSITION: Formalin
PROSECTOR: Andrew Cartoceti

HISTORY AND CLINCICAL OBSERVATIONS:

KEEPER OBSERVATIONS: On By

CLINICIAN OBSERVATIONS: On 7/28/2017 By KB

Animal presented moribund (upright in water column not moving other than shallow gilling). Fish is from a known Mycobacterium positive tank. The fish was euthanized with a buffered MS-222 bath.

GROSS DESCRIPTION: On 8/18/2017 By ANC

Received is a female Cardinal tetra for necropsy on 28 July 2017 following euthanasia. The carcass is in good postmortem condition. The fish is placed whole in formalin to aid in histologic processing.

GROSS DIAGNOSIS: By ANC

No significant external lesions identified

LABORATORY STUDIES:

TISSUE STATUS:

SHELVED:	False
TRIMMED:	True
FROZEN:	False
ULTRAFROZEN:	False

Tissues Ultrafrozen:

SPECIAL REQUESTS: On By

HISTOLOGY: On 8/18/2017 By ANC

1. WHOLE BODY, EYES, GILLS, EAR, PSEUDOBRANCH, LIVER, KIDNEY, DIGESTIVE TRACT, OVARY

MORPHOLOGIC DIAGNOSIS:

1) Liver, kidney: Granulomatosis (suspect Mycobacteriosis)
2) Liver, kidney, gills, skeletal muscle: Disseminated lymphohistiocytic inflammation with intralesional parasites
3) Gill: Abundant oomycete overgrowth

REMARKS: On 8/18/2017 By ANC

8/18/17: Widespread granulomas found in several organs are highly suspicious for mycobacteriosis as the cause of death. Due to the history of mycobacterium within this tank and the likelihood of this etiology based on consistent histologic lesions, acid-fast staining will not be performed for confirmation. Additionally, there is widespread lymphohistiocytic inflammation with phagocytosed parasites resembling that described in case N17-0153/500808. Based on the staining characteristics of organisms in that case, Mesomycetozoa or Purkinsus sp. were considered possible etiologies. Water mold overgrowth of the gills likely represents secondary saprolegniasis in a debilitated fish.

Andrew Cartoceti	Andrew Cartoceti	8/18/2017
PROSECTOR	PATHOLOGIST	DATE COMPLETED

Printed on: 8/18/2017 8:27:24 AM CARES-MED v2.119

Pathology Module - Final Pathology Report
NATIONAL ZOOLOGICAL PARK

PATH # N2017-0163

Death Date: 8/2/2017
Necropsy Date: 8/2/2017

APTERONOTUS ALBIFRONS
Black ghost knifefish
Name:

Sex

Gender: Unknown

Accession No.: 500882

Age:

Birth:

Acquired: 11 Jul 2017

SEX: Unknown Sex AGE: ADULT WEIGHT: 2.2 gm STAY:

MANNER OF DEATH:Died
TIME OF DEATH:
DEATH LOCATION:Q3
SUBMITTOR:Saffoe
OWNER/ANIMAL DEPT:DOA

INTERVAL:0-6 hours
XRAYED:False
DISPOSITION:ALL IN FORMALIN
PROSECTOR:KAH

HISTORY AND CLINCICAL OBSERVATIONS:

KEEPER OBSERVATIONS: On 8/2/2017 By CS

This animal has been observed swimming with what seemed to be a lot of effort and not moving with the rest of the group for the past two days. Today the animal was found at the bottom of the tank not moving. When the keeper went to grab it, it swam away very awkwardly and didn't get very far. It was collected for human euthanasia, but died on its own on the way to the hospital.

CLINICIAN OBSERVATIONS: On By

GROSS DESCRIPTION: On 8/2/2017 By KAH

Presented for necropsy is an adult 2.2 g black ghost knifefish of unknown sex. Total body length is 7.8 cm. Postmortem condition is adequate and body condition is adequate. There is minimal intracoelomic fat, but the liver is pale orange. No gross abnormalities are seen, and the entire carcass is placed in formalin.

GROSS DIAGNOSIS: By

LABORATORY STUDIES:

TISSUE STATUS:

False

SHELVED:

TRIMMED: True

FROZEN: False

ULTRAFROZEN: False

Tissues
Ultrafrozen:

SPECIAL REQUESTS: On By

HISTOLOGY: On 8/24/2017 By KAH

1. LIVER, GI, HEART, SWIM BLADDER

2. BRAIN, KIDNEY, HEAD, EYE, BODY

MORPHOLOGIC DIAGNOSIS:

1) Gills: Branchitis, proliferative, with intralesional protozoans.

REMARKS: On 8/28/2017 By KAH

The identity of the protozoal gill parasite is unclear, but there are numerous visible in the gill sections. Organisms are 2-5 um in diameter, round to oval, intracellular and free on the surface with an eccentric nucleus/karyosome. If other fish from this tank show similar signs, further diagnostics may be warranted (EM, PCR). Special stains are pending, and this report will be updated with an addendum when results are available.

KAH	Holder	8/28/2017
PROSECTOR	PATHOLOGIST	DATE COMPLETED

Printed on: 8/28/2017 3:46:30 PM CARES-MED v2.119

Pathology Module - Final Pathology Report
NATIONAL ZOOLOGICAL PARK

PATH # N2017-0164

Death Date: 8/3/2017
Necropsy Date: 8/3/2017

ANTHROPOIDES PARADISEUS
Stanley crane
Name:

Gender: Female

Age: 28Y 10M 21

Chip: 985 112 006 234 598

Accession No.: 211144

Birth:
13 Sep 1988

Acquired: 14 Feb 1990

Removed:
03 Aug 2017

SEX: Female	AGE: 28Y 10M 21	WEIGHT: 4.5 kg	STAY: > 30 Days
MANNER OF DEATH:Euthanasia		INTERVAL:0-6 hours	
TIME OF DEATH:09:30		XRAYED:True	
DEATH LOCATION:WHS		DISPOSITION:INCINERATE	
SUBMITTOR:KB		PROSECTOR:KAH	
OWNER/ANIMAL DEPT:DOO			

HISTORY AND CLINCICAL OBSERVATIONS:

KEEPER OBSERVATIONS: On By

CLINICIAN OBSERVATIONS: On 8/3/2017 By KB

This 28 year old female Stanley crane (211144) was diagnosed with a presumed sarcocystis infection based on rising blood titers taken when the animal began to exhibit signs of mild ataxia in Oct 2015. Mild ataxia persisted despite treatment attempts. Recently, significant progression was noted and this animal's mobility declined to the point where quality of life was a concern and euthanasia was elected. This animal was euthanized IV with euthasol and KCl

GROSS DESCRIPTION: On 8/3/2017 By KAH

Presented for necropsy is an adult 4.5 kg female Stanley crane. The RFID chip reads 985 112 006 234 598. A leg band reads FL 3815. Postmortem condition is excellent. Body condition is diminished with a prominent keel, atrophied pectoral musculature, and minimal subcutaneous or intracoelomic fat. The stomach contains abundant mealworms. There are abrasions on the carpus and antebrachium of the left wing. The right wing is pinioned at the carpus. The nail of the left lateral digit is absent.

No additional abnormalities are noted.

GROSS DIAGNOSIS: By KAH

Body as a whole: Diminished body condition.

Left wing: Traumatic abrasion, antebrachium.

Left foot: Amputation of distal phalanx of lateral digit.

Right wing: Status post pinion amputation.

LABORATORY STUDIES:

TISSUE STATUS:

SHELVED:	False
TRIMMED:	True
FROZEN:	False
ULTRAFROZEN:	True
Tissues Ultrafrozen:	liver, kidney, heart, lung, brain

SPECIAL REQUESTS: On By

HISTOLOGY: On 8/24/2017 By KAH

1. BRAIN
2. BRAIN
3. CERVICAL SPINAL CORD
4. THORACIC SPINAL CORD
5. SACRAL CORD, LIVER
6. KIDNEY, THYROID, SPLEEN
7. LUNG
8. PROVENTRICULUS, VENTRICULUS, ESOPHAGUS, ILEOCECOCOLIC JUNCTION
9. OVARY, HEART, COLON, DUODENUM, PANCREAS

MORPHOLOGIC DIAGNOSIS:

1) Arteries: Atherosclerosis, multifocal, moderate to severe, with mineralization.

2) Intestine: Enterotyphlocolitis, lymphoplasmacytic to heterophilic, moderate to severe, diffuse.

3) Coelom: Peritonitis, lymphocytic, multifocal to coalescing, moderate.

4) Kidney: Nephritis, lymphocytic, multifocal, mild.

5) Liver: Hepatitis, periportal, lymphocytic, mild.

6) Spleen: Endothelial hypertrophy, marked.

7) Ventriculus: Ventriculitis, lymphoplasmacytic, mild.

REMARKS: On 8/24/2017 By KAH

No identifiable neurological lesions were noted; however, functional neurological disease is not always histologically detectable. Additionally, there was significant narrowing of large arteries by mineralizing plaques. This finding is a fairly common disease in some taxa of birds, and has been linked to "claudication-like syndrome" of muscle weakness in an Amazon parrot.*

The enterocolitis was severe enough that it was likely clinically relevant, but no specific etiology was identified.

*Beaufrère H, Holder KA, Bauer R, Schnellbacher R, Pariaut R, Tully Jr TN, Wakamatsu N. Intermittent claudication-like syndrome secondary to atherosclerosis in a yellow-naped Amazon parrot (Amazona ochrocephala auropalliata). Journal of avian medicine and surgery. 2011 Dec;25(4):266-76.

KAH	KAH	8/24/2017
PROSECTOR	PATHOLOGIST	DATE COMPLETED

Printed on: 8/24/2017 12:05:25 PM CARES-MED v2.119

Pathology Module - Final Pathology Report
NATIONAL ZOOLOGICAL PARK

PATH # N2017-0165

Death Date: 8/3/2017
Necropsy Date: 8/3/2017

LANIUS LUDOVICIANUS MIGRANS
Loggerhead shrike
Name:

Gender: Male

Age: 9Y 1M 24D

Chip: 081-377-058

Accession No.: 216280

Birth:
10 Jun 2008

Acquired: 15 Nov 2013

Removed:
03 Aug 2017

SEX: Male	AGE: 9Y 1M 24D	WEIGHT: 49 gm	STAY:
MANNER OF DEATH: Euthanasia			INTERVAL: 6-24 hours
TIME OF DEATH: 09:30			XRAYED: False
DEATH LOCATION: SCBI Vet Hospital			DISPOSITION: INCINERATE
SUBMITTOR: K Helmick			PROSECTOR: K Helmick
OWNER/ANIMAL DEPT: DCM			

HISTORY AND CLINCICAL OBSERVATIONS:

KEEPER OBSERVATIONS: On By

CLINICIAN OBSERVATIONS: On 8/3/2017 By KH

This geriatric post reproductive shrike has had a low grade chronic infection of the nasal cavities for more than 1.5 years. Treatment has been unable to completely clear the infection which has now spread to the right eye and adjacent sinuses. The infection has created a destructive lesion with occlusion and erosion of the RT nares and partial occlusion of the LT nares, with epiphora, corneal edema and micropthalmia OD. Additionally the bird has experienced a general decline in health over the past several months, including weight loss and diminished flight ability. This bird currently is blind in the right eye, has experienced a 10% weight loss over the past few months with an 18% loss overall, and cannot fly more than a few seconds without losing altitude. It is suspected that these changes are all age related and the result of a long term chronic infection. Further handling for invasive diagnostics and treatments are likely to only worsen the birds condition due to the stress associated with repeated handling of an easily stressed species. With an overall poor prognosis and a destructive infection that is refractory to treatment, euthanasia is requested based on animal welfare concerns and a poor quality of life. Wt prior to death = 47.5 gm. (Lynch, Helmick)

GROSS DESCRIPTION: On 8/3/2017 By KAH

Presented for necropsy is an adult intact male loggerhead shrike weighing 49.4 g. Postmortem and body condition are adequate. There is noticeable intracoelomic fat. There is a silver leg band on the left leg which reads 1731-02030. The stomach is empty.

The right nasal cavity is completely occluded by yellow, firm, caseous material. A smaller amount is present in the left nostril. Upon reflection of the cranial skin, there is a 1.5 cm hemorrhagic region in the skull bones of the caudal calvarium. There

is a 2 mm soft, pale nodule in the skin of the right pectoral region. A 2x2x3 mm soft, pale tan mass is noted attached to a vessel on the left ventral neck. The liver is slightly reddened and soft.

No other abnormalities are noted.

GROSS DIAGNOSIS: By KAH

Nasal cavity: Caseous rhinitis, severe.

Skull: Focal hemorrhage.

LABORATORY STUDIES:

TISSUE STATUS:

SHELVED:	False
TRIMMED:	True
FROZEN:	False
ULTRAFROZEN:	True
Tissues Ultrafrozen:	liver, kidney, lung

SPECIAL REQUESTS: On By

HISTOLOGY: On 8/24/2017 By KAH

1. HEART, TRACHEA, ESOPHAGUS, LUNG

2. LIVER, PROVENTRICULUS, VENTRICULUS, ILEOCECAL JUNCTION, DUODENUM, PANCREAS

3. TESTIS, KIDNEY, MASS, BRAIN

4. NASAL CAVITY, NASAL PLUG

5. EYE

MORPHOLOGIC DIAGNOSIS:

1) Nasal cavity: Rhinitis, heterophilic and granulomatous, severe, with abundant squamous hyperplasia.

2) Liver: Extramedullary hematopoiesis, atypical, marked

3) Heart, coronary arteries: Arteriosclerosis, moderate.

4) Eye: Dacryoadenitis, lymphohistiocytic, moderate.

REMARKS: On 8/24/2017 By KAH

The rhinitis in this animal was severe and there was evidence of bony remodeling and other chronic changes. The majority of the intranasal plug is composed of compacted keratin, but there are bacteria, fungal hyphae, and crystalline material also admixed. The identity of the crystalline material is undetermined, but cellular breakdown products are suspected. Due to the significant keratin accumulation, hypovitaminosis A should be considered as a potential contributing cause.

The hepatitis in this case was significant enough that it may have contributed to overall poor health.* [see addendum]

Addendum, 8/25/17: After further consultation and evaluation, the liver lesion is reclassified as an unusual presentation of extramedullary hematopoiesis,and is unlikely to be clinically significant. It is considered a probable secondary response to chronic inflammation and/or hypoxemia due to the nasal disease.

K Helmick	KAH	8/24/2017
PROSECTOR	PATHOLOGIST	DATE COMPLETED

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Pathology Module - Final Pathology Report
NATIONAL ZOOLOGICAL PARK

PATH # N2017-0166

Death Date: 8/5/2017
Necropsy Date: 8/5/2017

PARACHEIRODON AXELRODI
Cardinal tetra
Name:

Sex

Gender: Unknown

Accession No.: 500808

Age:

Birth:

Acquired: 20 Oct 2014

31 Dec 2016

SEX: Unknown Sex AGE: ADULT WEIGHT: 3 gm STAY: > 30 Days

MANNER OF DEATH: Found Dead
TIME OF DEATH: 06:45
DEATH LOCATION: FSA6
SUBMITTOR: Dennis Charlton, DOA
OWNER/ANIMAL DEPT: DOA

INTERVAL: 0-6 hours
XRAYED: False
DISPOSITION: IN FORMALIN
PROSECTOR: Clippinger

HISTORY AND CLINCICAL OBSERVATIONS:

KEEPER OBSERVATIONS: On 8/5/2017 By DC

0.0.1 cardinal tetra - found deceased in tank FSA #6. All other fish in tank are normal BAR.

Specimen submitted to pathology.

CLINICIAN OBSERVATIONS: On By

GROSS DESCRIPTION: On 8/7/2017 By KAH

The carcass of a deceased adult Cardinal tetra, sex unknown pending histology, is received on 5 August 2017 for necropsy. The 3.8 cm carcass is 3 g. No skin lesions are observed. A slit is made skin of the ventral abdomen and the entire carcass is placed into 10% formalin for histology.

GROSS DIAGNOSIS: By

LABORATORY STUDIES:

TISSUE STATUS:

False

SHELVED:

TRIMMED: True

FROZEN: False

ULTRAFROZEN: False

Tissues
Ultrafrozen:

SPECIAL REQUESTS: On By

HISTOLOGY: On 8/24/2017 By KAH

1. HEAD AND BODY

MORPHOLOGIC DIAGNOSIS:

1) Whole body: Moderate to severe postmortem autolysis.

2) Multiple organs: Granulomas consistent with mycobacteriosis.

REMARKS: On 8/24/2017 By KAH

Autolysis in this case was severe and may have obscured relevant diagnostic lesions. Despite this, granulomas were identifiable in many organs.

Clippinger	Holder	8/24/2017
PROSECTOR	PATHOLOGIST	DATE COMPLETED

Printed on: 8/24/2017 12:12:23 PM CARES-MED v2.119

Pathology Module - Final Pathology Report
NATIONAL ZOOLOGICAL PARK

PATH # N2017-0167

Death Date: 8/5/2017
Necropsy Date: 8/6/2017

NANGER DAMA RUFICOLLIS
Addra gazelle
Name:

Gender: Male

Age: 0Y 1M 12D

Accession No.: 115567

Chip: 933000220007727

Birth:
24 Jun 2017

Acquired:

Removed:
05 Aug 2017

SEX: Male AGE: 0Y 1M 12D WEIGHT: 15 kg STAY: > 30 Days
MANNER OF DEATH:Euthanasia INTERVAL:6-24 hours
TIME OF DEATH:11:22 XRAYED:True
DEATH LOCATION:Meade Barn MH06 DISPOSITION:INCINERATE
SUBMITTOR:Lawrence Layman, Team 2 SCBI PROSECTOR:Holder / Clippinger / Bauer
OWNER/ANIMAL DEPT:DCM

HISTORY AND CLINCICAL OBSERVATIONS:

KEEPER OBSERVATIONS: On 8/5/2017 By LL

Calf was found at approximately 9:40 alert and sitting upright but unable to stand. Calf was housed in a group situation containing 3 adult females and 3 calves. No visual injuries were noted. Calf had been observed around 07:00 and appeared in good health and mobile. Anesthetized using Ketamine and Xylazline and euthanized using Euthasol via jugular.

CLINICIAN OBSERVATIONS: On By

GROSS DESCRIPTION: On 8/7/2017 By KAH

A male, six week old, 15 kg Addra (Dama) Gazelle is presented for necropsy on 6 August 2017. There is a surgical incision at the base of the scrotum, and the testes are absent without hemorrhage (postmortem gonad collection). The carcass is in good postmortem condition and good body condition with small subcutaneous and intra-abdominal stores of adipose tissue and good muscling. A circular white ear tag L 0383 is present in the left ear pinna. There is an approximately 2 cm superficial laceration/abrasion on the ventromedial surface of the left metatarsus. There is a 1.4 cm x 2 mm hairless abrasion associated with local bruising in the right inguinal area and a 2 cm x 7 mm area of shortened hair on the R cranial chest. The hornbuds are present but not developed.

A 3 mm bulla is noted on the surface of the right lung. The lung is mildly mottled red. Upon removal of the pluck, there is moderate hemorrhage present along the ventral aspect of vertebrae 9-10 and diffusely surrounding vertebrae 10-13. The left epaxial musculature overlying the left thorax has an approximately 8 cm area of intramuscular hemorrhage. There are oblique slab/avulsion fractures of the caudal spinous process of T10, T11, T12 and greenstick fractures at the physes/osteochondral junction of T8&T9. A section of spinal cord from T8-13 is removed, and hemorrhage is noted in the cord at T13.

The oral cavity, eyes, ears, tongue, esophagus, trachea, thymus, thyroid, heart, pancreas, rumen, reticulum, omasum, abomasum, intestines, adrenals, kidneys, spleen, skeletal musculature, appendicular joints, and brain are grossly normal.

GROSS DIAGNOSIS: By KAH

Thoracic vertebrae: Complete oblique fractures of dorsal spinous processes, T10-12; greenstick osteochondral fractures, dorsal spinous processes of T8 and T9. Paravertebral hemorrhage.

Spinal cord: Hemorrhage, T13 level.

Epaxial musculature: Intramuscular hemorrhage, focal, acute.

LABORATORY STUDIES:

TISSUE STATUS:

SHELVED:	False
TRIMMED:	True
FROZEN:	False
ULTRAFROZEN:	True
Tissues Ultrafrozen:	liver, kidney, lung

SPECIAL REQUESTS: On 8/5/2017 By BP

Testes removed at SCBI hospital, wrapped in saline-soaked gauze, and refrigerated for Reproductive Division

HISTOLOGY: On 8/24/2017 By KAH

1. THORACIC SPINAL CORD
2. LIVER, KIDNEY, ADRENAL
3. LUNG, SPLEEN, BULLA
4. HEART
5. TONGUE, EPAXIAL MUSCLE, THYROID
6. MESENTERIC NODE, JEJUNUM, RUMEN
7. RETICULUM, OMASUM, ABOMASUM
8. MARROW, BRAIN
9. BRAIN

MORPHOLOGIC DIAGNOSIS:

1) Thoracic spinal cord: Intramedullary hemorrhage.

2) Liver: Hepatic congestion.

3) Kidney: Increased protein in the glomerular urinary space.

4) Heart: Epicardial hemorrhage.

5) Rumen: Rumenitis, suppurative, mild.

REMARKS: On 8/24/2017 By KAH

Histological findings are consistent with the grossly noted traumatic spinal fractures. Hemorrhage in the cord was acute with minimal reactive change.

Holder / Clippinger / Bauer	Holder	8/24/2017
PROSECTOR	PATHOLOGIST	DATE COMPLETED

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Pathology Module - Final Pathology Report
NATIONAL ZOOLOGICAL PARK

PATH # N2017-170

Death Date: 8/9/2017
Necropsy Date: 8/9/2017

EULEMUR RUFUS
Red-fronted lemur
Name: Red Oak

Gender: Male

Age: 24Y 4M 26D

Chip: 00-0133-AA7D

Accession No.: 113690

Birth:
14 Mar 1993

Acquired: 25 Sep 2001

Removed:
09 Aug 2017

SEX: Male AGE: 24Y 4M 26D WEIGHT: 3.07 kg STAY:

MANNER OF DEATH:Died
TIME OF DEATH:
DEATH LOCATION:WHS
SUBMITTOR:Kendra Bauer
OWNER/ANIMAL DEPT:

INTERVAL:0-6 hours
XRAYED:False
DISPOSITION:INCINERATE
PROSECTOR:Holder

HISTORY AND CLINCICAL OBSERVATIONS:

KEEPER OBSERVATIONS: On By

CLINICIAN OBSERVATIONS: On 8/9/2017 By KB

This animal was observed to be normal initially this AM but was observed to go limp and release urine and feces passively. The animal was not responsive during this time but slowly regained responsiveness and strength. Respiratory rate was elevated during this time. On exam, radiographs showed that the heart was noted to be shifted to the left and the left lung did not appear to be inflated. On blood work, phosphorus was elevated. During recovery from anesthesia, the animal arrested and did not respond to atropine, epinephrine, and chest compressions. After ceasing CPR, a faint heart beat was detected and euthasol was administered intracardiac. During the coding event, large suspect hematoma formation was also noted on the left inner thigh.

This animal has a recent history of a luxated P3 of right hind digit 4 due to an unknown injury. This animal also has a chronic history of severe steroid-responsive rhinitis. This animal was on chronic treatment with triamcinolone.

GROSS DESCRIPTION: On 8/9/2017 By KAH

Presented for necropsy is a 3.07 kg intact male red-fronted lemur. Postmortem condition is excellent. Body condition is obese with abundant subcutaneous, intra-abdominal, and intrathoracic fat. A transponder chip reads 00-0133-AA7D.

All teeth of the maxillary dental comb (incisors and canines) are absent. Mandibular incisors are also absent. An undetermined number of premolars and molars are missing from mandibular and maxillary arcades (photos available). The fourth digit of the right hindlimb has a lateral dislocation of the distal phalanx. The left medial thigh is markedly discolored by abundant subcutaneous hemorrhage which extends

intermuscularly to the femoral vein. Fat between the internal and external abdominal muscles is clear and gelatinous (serous atrophy). The stomach is empty.

Within the fat in the thoracic cavity, there is a 2.3x1.4x0.9 cm, firm, mottled tan, well-demarcated mass adhered to the pericardium over the left atrium. Within the mesenteric fat there is a friable, firm, tan mass approximately 1.2 cm in diameter. The liver is mottled red to pale tan with an irregular surface. Bilaterally, the renal cortices are multifocally indented in 1-2 mm foci visible at the capsular surface. The left kidney has several cysts, the largest of which are 8 and 6 mm diameter.

The left nasal cavity has an 8 mm diameter abscess containing tenacious pale tan mucopurulent material.

The marrow is clear and liquified (serous atrophy).

The adrenals were not difinitively identified grossly.

Remaining tissues are grossly normal.

GROSS DIAGNOSIS: By KAH

Body as a whole: Overconditioned

Thoracic cavity: Pleural mass (ddx necrotic fat, chronic lymphadenitis, neoplasm)

Left hindlimb: Locally extensive subcutaneous and intramuscular hemorrhage.

Liver: Nodular hyperplasia.

Nasal cavity: Chronic mucupurulent rhinitis.

Marrow and abdominal intramuscular fat: Serous atrophy of fat.

Kidneys: Bilateral renal cortical infarcts, multifocal, mild. Left kidney renal cysts.

Oral cavity: Multiple dental loss.

Abdominal cavity: Necrotic fat nodule.

Right hindlimb: Fourth digit distal phalangeal luxation.

LABORATORY STUDIES:

CYTOLOGY: Nasal swab

TISSUE STATUS:

SHELVED: False

TRIMMED: True

FROZEN: False

ULTRAFROZEN: True

Tissues Ultrafrozen: liver, kidney

SPECIAL REQUESTS: On By

HISTOLOGY: On 8/31/2017 By KAH

1. NASAL CAVITY

2. NASAL CAVITY

3. KIDNEY, LIVER

4. KIDNEY, HEART, SPLEEN

5. LUNG, HEMATOMA

6. THORACIC MASS

7. TONGUE, MESENTERIC MASS, GI, URINARY BLADDER

8. GI, ACCESSORY SEX GLAND

9. BRAIN

MORPHOLOGIC DIAGNOSIS:

1) Lung: Bronchial adenocarcinoma.

2) Colon: Colitis, eosinophilic to granulomatous with intraluminal nematodes and a submucosal granuloma centered on a degenerate nematode.

3) Heart: Myocardial fibrosis, multifocal, moderate.

4) Nasal cavity: Rhinitis, mucopurulent to pyogranulomatous, chronic, moderate to severe, with intralesional bacteria.

5) Small intestine: Enteritis, lymphoplasmacytic and eosinophilic, moderate, with prominent crypt mitotic activity.

6) Skeletal muscle, hindlimb: Hemorrhage, locally extensive.

7) Lung: Pneumonia, granulomatous and eosinophilic, interstitial, mild.

8) Kidney: Protein losing nephropathy, minimal, with tubular mineralization and scattered cysts.

9) Liver: Vacuolar degeneration, indistinct, centrilobular, mild.

10) Liver: Extramedullary hematopoiesis, multifocal, mild.

11) Lung: Pneumoconiosis, mild.

12) Lung: Hyperinflation and emphysema, mild.

13) Urinary bladder, muscularis: Perivasculitis, lymphoplasmacytic, focal.

14) Mesenteric mass: Fat necrosis, focal.

REMARKS: On 8/31/2017 By KAH

In addition to the well-documented rhinitis in this animal, the mass suspected at euthanasia and confirmed at necropsy was identified as a malignant neoplasm of the bronchial epithelium. The tumor was contiguous with the bronchial mucosa and had marked fibrosis with evidence of chronic inflammation, hemorrhage, and mucus production. While well-differentiated neoplastic cells predominate, there are areas where tumor cells invade the tunica adventitia of arteries. No evidence of metastasis was identified.

The severity of the enterocolitis is enough to be clinically significant, and the history of steroid administration may have masked some clinical or histological severity. The strong eosinophilic component indicates that the nematodes noted histologically are contributory.

Myocardial fibrosis is most likely an aging change and may not have been clinically significant, but also potentially predisposed the animal to arrhythmias or cardiac stress.

The mild pneumonia is of undetermined etiology and may be a response to environmental contaminants, which are also the most likely source of pneumoconiosis. Hyperinflation is presumed to be secondary to resuscitation efforts.

Renal lesions are presumed to be age related.

Holder	Holder	8/31/2017
PROSECTOR	PATHOLOGIST	DATE COMPLETED

Printed on: 8/31/2017 2:10:26 PM CARES-MED v2.119

Pathology Module - Final Pathology Report
NATIONAL ZOOLOGICAL PARK

PATH # N2017-0171 Death Date: 8/10/2017
Necropsy Date: 8/10/2017

CORYDORAS PALEATUS
Peppered catfish
Name

Sex Gender: Unknown

Accession No 50079

Age: Birth:

Acquired: 07 Aug 2006

31 Dec
015

SEX: Unknown Sex AGE: ADULT WEIGHT: 0 gm STAY:

MANNER OF DEATH Found Dead INTERVAL 0 6 hours
TIME OF DEATH: XRAYED:False
DEATH LOCATION:FSA4 DISPOSITION:ALL IN FORMALIN
SUBMITTOR:Lando McCall - AMZ PROSECTOR:Holder
OWNER/ANIMAL DEPT DOA

HISTORY AND CLINCICAL OBSERVATIONS:

KEEPER OBSERVATIONS On 8/10/ 017 By LM

Fish found at bottom of tank during morning feeding. Fish was behind some plant vegetation. Snails were present on body. Eyes were not present. This is a mixed exhibit, Myco+ tank

CLINICIAN OBSERVATIONS On By

GROSS DESCRIPTION: On 8/10/2017 By KAH

Presented for necropsy is the skeleton of an adult corydoras catfish No soft tissue remains.

GROSS DIAGNOSIS: By

LABORATORY STUDIES

TISSUE STATUS:

SHELVED: True

TRIMMED: False

FROZEN: False

ULTRAFROZEN: False

Tissues
Ultrafrozen:

SPECIAL REQUESTS: On By

HISTOLOGY: On By

MORPHOLOGIC DIAGNOSIS:

REMARKS: On 8/10/2017 By KAH

Fish is skeletonized. No soft tissue remains; no necropsy performed.

Holder	Holder	8/10/2017
PROSECTOR	PATHOLOGIST	DATE COMPLETED

Printed on: 8/10/2017 11:34:54 AM CARES-MED v2.119

Pathology Module - Final Pathology Report
NATIONAL ZOOLOGICAL PARK

PATH # N2017-0172

Death Date: 8/11/2017
Necropsy Date: 8/11/2017

PARACHEIRODON AXELRODI
Cardinal tetra
Name:

Gender: Unknown Sex
Age:

Accession No.: 500808
Birth:
Acquired: 20 Oct 2014
31 Dec 2016

SEX: Unknown Sex AGE: ADULT WEIGHT: 0.4 gm STAY:
MANNER OF DEATH:Found Dead INTERVAL:0-6 hours
TIME OF DEATH: XRAYED:False
DEATH LOCATION:FSA6 DISPOSITION:ALL IN FORMALIN
SUBMITTOR:Lando McCall - AMZ PROSECTOR:Holder
OWNER/ANIMAL DEPT:DOA

HISTORY AND CLINCICAL OBSERVATIONS:

KEEPER OBSERVATIONS: On 8/11/2017 By LM

Fish was found deceased floating at the top of the tank during morning tan inspection. Body in good condition upon recovery.

CLINICIAN OBSERVATIONS: On By

GROSS DESCRIPTION: On 8/11/2017 By KAH

Presented for necropsy is a 0.4 g, 3.0 cm long, adult cardinal tetra of unknown sex. The carcass is noticeably autolyzed with clouded corneas, absent tail fins, and soft flesh. No external lesions are noted. The ventral midline is incised, and the carcass is placed whole in formalin.

GROSS DIAGNOSIS: By KAH

Body as a whole: Marked autolysis.

LABORATORY STUDIES:

TISSUE STATUS:

SHELVED:	False
TRIMMED:	False
FROZEN:	False
ULTRAFROZEN:	False

Tissues Ultrafrozen:

SPECIAL REQUESTS: On By

HISTOLOGY: On 9/5/2017 By KAH

BODY: EYE, BRAIN, GILL, KIDNEY, LIVER, SKIN

MORPHOLOGIC DIAGNOSIS:

1) Whole body: Severe postmortem autolysis.
2) Body as a whole: Multisystemic granulomas. Suspect mycobacteriosis
3) Skin: Saprolegniasis

REMARKS: On 9/5/2017 By KAH

Autolysis in this case was severe and may have obscured relevant diagnostic lesions. There is extensive postmortem proliferation of bacteria and other organisms throughout the tissues examined. There are abundant granulomas in multiple locations, consistent with mycobacteriosis. The skin sports a heavy growth of hyphal organisms consistent with Saprolegnia spp, but colonization or proliferation postmortem must be considered.

Holder	Holder	9/5/2017
PROSECTOR	PATHOLOGIST	DATE COMPLETED

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Pathology Module - Final Pathology Report
NATIONAL ZOOLOGICAL PARK

PATH # N2017-0173

Death Date: 8/12/2017
Necropsy Date: 8/12/2017

PLOCEUS VELATUS (no subsp)
Southern masked weaver
Name:

Gender: Female

Age: 22Y 2M 26D

Accession No.: 213618

Birth:
17 May 1995

Acquired:

Removed:
12 Aug 2017

SEX: Female AGE: 22Y 2M 26D WEIGHT: 17.4 gm STAY:
MANNER OF DEATH:Found Dead INTERVAL:6-24 hours
TIME OF DEATH: XRAYED:True
DEATH LOCATION:BH5/6 DISPOSITION:ALL IN FORMALIN
SUBMITTOR:Rick Pinto PROSECTOR:Holder
OWNER/ANIMAL DEPT:DOO

HISTORY AND CLINCICAL OBSERVATIONS:

KEEPER OBSERVATIONS: On 8/12/2017 By RP

Bird was very old but always seemed healthy. She was found in exhibit bh5/6 in the middle of the gravel area with the ants (but not too many). There seemed to be some trauma noticed around the face and neck area at time of pick up from the ground.

CLINICIAN OBSERVATIONS: On By

GROSS DESCRIPTION: On 8/12/2017 By KAH

Presented for necropsy is a 17.4 g, adult, female Southern masked weaver bird. Postmortem condition is good, though there are a few ants on the carcass. Body condition is good with excellent musculature but minimal intracoelomic or subcutaneous fat. There is a silver leg band on the right leg with the digits 91.

There is marked subcutaneous hemorrhage surrounding the maxilla and nares. The lungs are dark red and mottled. The hocks have foci of hemorrhage. The left foot is reddened and one digit is fractured, but there is no hemorrhage (postmortem).

No additional abnormalities are noted.

GROSS DIAGNOSIS: By KAH

Head, maxilla: Subcutaneous hemorrhage, marked, acute.

Lungs: Pulmonary hemorrhage, acute.

LABORATORY STUDIES:

TISSUE STATUS:

SHELVED:	False
TRIMMED:	True
FROZEN:	False
ULTRAFROZEN:	True
Tissues Ultrafrozen:	Liver, kidney, lung

SPECIAL REQUESTS: On By

HISTOLOGY: On 9/5/2017 By KAH

1. HEART, LUNG, TRACHEA, TONGUE
2. VENTRICULUS, LIVER, GI
3. KIDNEY, BRAIN
4. HEAD

MORPHOLOGIC DIAGNOSIS:

1) Lung: Histiocytic parabronchitis with vacuolation, subacute.

2) Nasal cavity: Hemorrhage.

3) Great vessels: Atherosclerosis, moderate.

4) Ventriculus: Focal mural mineralization.

REMARKS: On 9/5/2017 By KAH

The lung has foamy macrophages with what appears to be lipid vacuoles in numerous parabronchi. Origin of the lipid is unknown. Nasal cavity hemorrhage is likely secondary to the grossly noted trauma, which was likely much more relevant to cause of death. Atherosclerosis and mural mineralization are presumed to be age-related and unlikely to be related to cause of death.

Holder	Holder	9/5/2017
PROSECTOR	PATHOLOGIST	DATE COMPLETED

Printed on: 9/5/2017 4:35:10 PM CARES-MED v2.119

Pathology Module - Final Pathology Report
NATIONAL ZOOLOGICAL PARK

PATH # N2017-0174

Death Date: 8/13/2017
Necropsy Date: 8/13/2017

HYPHESSOBRYCON SOCOLOFI
Lesser bleeding heart tetra
Name:

Gender: Unknown Sex
Age:

Accession No.: 500820
Birth:
Acquired: 11 Feb 2015
01 Jul 2016

SEX: Unknown Sex AGE: ADULT WEIGHT: 0 gm STAY:
MANNER OF DEATH: INTERVAL:6-24 hours
TIME OF DEATH: XRAYED:False
DEATH LOCATION:Pool 4 DISPOSITION:ALL IN FORMALIN
SUBMITTOR:Lando McCall - AMZ PROSECTOR:Bauer
OWNER/ANIMAL DEPT:DOA

HISTORY AND CLINCICAL OBSERVATIONS:

KEEPER OBSERVATIONS: On 8/13/2017 By LM

A deceased Bleeding Heart tetra was found on the Rainforest pathway in front of Pool 4 while hosing down the area. Body is intact and in good condition.

CLINICIAN OBSERVATIONS: On By

GROSS DESCRIPTION: On 9/13/2017 By KB

Body incised and placed whole in formalin.

GROSS DIAGNOSIS: By

LABORATORY STUDIES:

TISSUE STATUS:

SHELVED:	False
TRIMMED:	True
FROZEN:	False
ULTRAFROZEN:	False

Tissues Ultrafrozen:

SPECIAL REQUESTS: On By

HISTOLOGY: On 9/5/2017 By KAH

1. GI
2. KIDNEY, LIVER, GONAD
3. SPINE, KIDNEY, HEAD, EYE, BRAIN

MORPHOLOGIC DIAGNOSIS:

1) Body as a whole: Severe autolysis

REMARKS: On 9/5/2017 By KAH

Autolysis in this case was severe and may have obscured relevant diagnostic lesions. Cause of death is undetermined.

Bauer	Holder	9/5/2017
PROSECTOR	PATHOLOGIST	DATE COMPLETED

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Pathology Module - Final Pathology Report
NATIONAL ZOOLOGICAL PARK

PATH # N2017-0175

Death Date: 8/13/2017
Necropsy Date: 8/14/2017

EQUUS CABALLUS PRZEWALSKII
Przewalski's wild horse
Name: Maja

Gender: Female
Age: 13Y 2M 19D
Chip: 968 000 004125489

Accession No.: 114189
Birth: 25 May 2004
Acquired: 07 Mar 2007
Removed: 13 Aug 2017

SEX: Female AGE: 13Y 2M 19D WEIGHT: 217 kg STAY: > 30 Days

MANNER OF DEATH:Euthanasia
TIME OF DEATH:
DEATH LOCATION:Slate Hill
SUBMITTOR:K Helmick
OWNER/ANIMAL DEPT:DCM

INTERVAL:24-48 Hours
XRAYED:False
DISPOSITION:INCINERATE
PROSECTOR:Holder

HISTORY AND CLINCICAL OBSERVATIONS:

KEEPER OBSERVATIONS: On By

CLINICIAN OBSERVATIONS: On 8/13/2017 By KEH

Observed 8/11/17 by KPR staff to be exhibiting symptoms of colic (looking at flank, kicking flank), sweating, closed eyes, lethargy, reduced fecal output. Produced dark red-black urine. Left eye held partially shut, but when opened appeared diffusely opaque. Spontaneous abortion 2016 with PCR confirmation of leptospirosis in fetus, high titers in this mare (L POMONA 3200, L HARDJO <100, L ICTERO 800, L GRIPPO <100, L CANICOLA 100, L AUTUMNALIS 1600, L BRATISLAVA 1600). No recorded history of previous Anaplasma serology. Darted with OTC and Banamine, partial consumption of oral Banamine and minocycline. Placed in tamer 8/12/17 for advanced symptomology including new findings of bruxism and groaning when 3-mo colt attempted to nurse, sedated for blood collection, IV fluid administration, administration of Banamine, OTC, enrofloxacin, vitamin B complex, vitamin E, unable to collect urine, OD WNL, no stain update OS with diffuse corneal edema. Patient declined further with advancing symptoms of pain, stumbling, leaning/trembling and difficulty standing, anorexia and continued production of dark red urine. Preliminary lab diagnostics support renal failure with inflammatory changes (elevated WBC, neutrophils, BUN, creatinine, P, K, AST, LDH, CPK, decreased lymphocytes). Postmortem urine dipstick positive for blood, ketones, bilirubin, pH 8.0. EPH, lepto panel, anaplasma titers pending. Serum, EDTA banked 8/12/17. Urine banked 8/13/17.

POSSIBLE ZOONOTIC: LEPTOSPIROSIS

GROSS DESCRIPTION: On 8/14/2017 By KAH

Submitted for necropsy is a 218 kg intact Przewalski's wild horse mare. Postmortem condition is mildly to moderately autolyzed. Body condition is thin with visible ribs and absent subcutaneous and intra-abdominal fat. A subcutaneous transponder reads 968000004125489. The hoof walls of all four feet are slightly overgrown. The right palpebra are moderately swollen and darkened. The udder is lactating. Stomach contains abundant chewed grass/hay. The colon contains dry fecal balls.
The point of the right hip has a 3 cm long scar that is haired, and the underlying subcutis is fibrotic, slightly hemorrhagic, and contains an encapsulated caseous nodule 6 mm in diameter.
The abdomen contains a small amount of red-brown translucent fluid. A moderate amount of similar fluid is noted in the pericardial sac. There are numerous 1-4 mm diameter, slightly raised, black plaques on the ventral peritoneal surface. Similar 1-2 mm foci are noted on the dorsal surface of the thoracic cavity. A fibrinous adhesion is present on the peritoneal surface of the left diaphragmatic crus and the adjacent hepatic capsular surface. The lungs are diffusely dark red and congested; all sections float in formalin. The right ovary has a large (2 x 2 x 3 cm) hemorrhagic follicle. The thymus is identifiable and prominent. The dura mater is slightly thickened.
No other gross abnormalities are seen.

GROSS DIAGNOSIS: By KAH

Right palpebrum: Locally extensive congestion and edema.
Left diaphragmatic crus: Locally extensive fibrinous peritonitis.
Pericardium: Hydropericardium, moderate.
Ventral peritoneum: Pigmented plaques.
Thoracic cavity: Pigmented plaques.
Right hip: Subcutaneous granuloma and hemorrhage, chronic.

LABORATORY STUDIES:

TISSUE STATUS:

SHELVED:	False
TRIMMED:	True
FROZEN:	False
ULTRAFROZEN:	True

Tissues Ultrafrozen: Liver kidney lung

SPECIAL REQUESTS: On By

HISTOLOGY: On 9/7/2017 By KAH

1. LIVER
2. KIDNEY
3. ADRENAL, SPLEEN, OVARY, MAMMARY
4. LUNG
5. HEART, STOMACH
6. AORTA, GI
7. PERITONEUM, URINARY BLADDER
8. GI
9. TONGUE, GI/ULCERS
10. PITUITARY, BRAINSTEM
11. HIPPOCAMPUS
12. CEREBELLUM, MIDBRAIN?
13. OPTIC NERVE, RETINA
14. CORNEA, IRIS
15. TAPETUM, LENS

MORPHOLOGIC DIAGNOSIS:

1) Liver: Multifocal coagulative necrosis and hemorrhage, moderate, with hemosiderosis and erythrophagocytosis.
2) Kidney: Pigmenturia (presumed hemoglobin), severe, with tubular degeneration, acute to subacute.
3) Kidney: Interstitial nephritis, lymphoplasmacytic, mild.
4) Small intestine: Enteritis, lymphoplasmacytic to eosinophilic, moderate, with pigment accumulation at villus tips.
5) Lung: Bronchitis, suppurative, moderate.
6) Lung: Pulmonary edema and congestion, subacute to chronic, with pigment-laden macrophages.
7) Spleen: Erythrophagocytosis, moderate.
8) Lymph node: Sinusoidal congestion, hemorrhage, and reactive lymphoid hyperplasia.
9) Heart: Epicardial hemorrhage.
10) Peritoneum: Multifocal varicosities with chronic hemorrhage.
11) Tongue: Intramuscular sarcocysts.

REMARKS: On 9/7/2017 By KAH

Changes in the liver and kidney are consistent with, though not definitive for, infection with leptospira. Liver necrosis and hemoglobinuria are highly supportive, and given the history of rising titers, diagnosis of presumptive leptospirosis is appropriate. Special stains for spirochetes are pending, and any new information will be added to this report as an addendum.
The enteritis was potentially clinical, and the eosinophilic component of the inflammation suggests either hypersensistivity or parasitic etiologies. The bronchitis may have been clinically relevant; auscultory and behavioral correlation required. The large number of organs with hemosiderin-laden macrophages indicates chronic hemorrhage or extravasation of erythrocytes, which may have placed further physiological strain on this animal.
Sarcocysts and peritoneal varicosities are of minimal clinical relevance.
Liver and kidney are available for outside PCR testing, if desired.

Holder	KAH	9/7/2017
PROSECTOR	PATHOLOGIST	DATE COMPLETED

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Pathology Module - Final Pathology Report
NATIONAL ZOOLOGICAL PARK

PATH # N2017-0176

Death Date: 8/15/2017
Necropsy Date: 8/15/2017

THAYERIA BOEHLKEI
Blackline penguin tetra
Name:

Gender: Unknown Sex
Age:

Accession No.: 500823
Birth:
Acquired: 11 Feb 2015
31 Dec 2016

SEX: Unknown Sex AGE: ADULT WEIGHT: 2.6 gm STAY:
MANNER OF DEATH:Found Dead INTERVAL:0-6 hours
TIME OF DEATH: XRAYED:False
DEATH LOCATION:FSA4 DISPOSITION:ALL IN FORMALIN
SUBMITTOR:Denny Charlton PROSECTOR:Holder
OWNER/ANIMAL DEPT:DOA

HISTORY AND CLINCICAL OBSERVATIONS:

KEEPER OBSERVATIONS: On 8/15/2017 By DC

0.0.1 penguin tetra - found deceased in FS #4 this AM. All tankmates appear BAR. Specimen submitted to pathology.

CLINICIAN OBSERVATIONS: On By

GROSS DESCRIPTION: On 8/15/2017 By KAH

Presented for necropsy is a 2.6 g adult penguin tetra of unknown sex. Postmortem condition is mildly autolyzed. Body condition is adequate. Fork length is 4.6 cm. Stomach contains grey-green viscous fluid.

No other gross abnormalities are noted.

GROSS DIAGNOSIS: By

LABORATORY STUDIES:
CULTURE: Fungal, stomach

TISSUE STATUS:

SHELVED:	False
TRIMMED:	False
FROZEN:	False
ULTRAFROZEN:	False

Tissues Ultrafrozen:

SPECIAL REQUESTS: On By

HISTOLOGY: On 9/7/2017 By KAH

1. LIVER, STOMACH, HEART, SWIM BLADDER, GI
2. KIDNEY, BODY, EYE, GILL, HEAD KIDNEY

MORPHOLOGIC DIAGNOSIS:

1) Body as a whole: Multisystemic granulomas. Suspect mycobacteriosis

REMARKS: On 9/7/2017 By KAH

There are abundant granulomas in multiple locations, consistent with mycobacteriosis as has previously been reported in this tank.

Holder	Holder	9/7/2017
PROSECTOR	PATHOLOGIST	DATE COMPLETED

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Pathology Module - Final Pathology Report
NATIONAL ZOOLOGICAL PARK

PATH # N2017-0177

Death Date: 8/17/2017
Necropsy Date: 8/17/2017

OOPHAGA PUMILIO
Strawberry poison frog
Name:

Gender: Unknown Sex
Age:

Accession No.: 307212
Birth:
Acquired: 07 Apr 2009
14 Sep 2016

SEX: Unknown Sex AGE: ADULT WEIGHT: 1 gm STAY:

MANNER OF DEATH: Found Dead
TIME OF DEATH: 06:30
DEATH LOCATION: Amazonia Biolab
SUBMITTOR: Cristina Castiglione
OWNER/ANIMAL DEPT: DOA

INTERVAL: 6-24 hours
XRAYED: False
DISPOSITION: Formalin
PROSECTOR: ANC

HISTORY AND CLINCICAL OBSERVATIONS:

KEEPER OBSERVATIONS: On 8/16/2017 By CC

Found deceased on morning checks. This poison dart frog had been under observation for 2 days due to decreased use of hind legs and abnormal lack of response to stimuli. She had an exam at DAH on 8/16/17. This frog shoe no obvious interest in food offered after return form hospital.

CLINICIAN OBSERVATIONS: On By

GROSS DESCRIPTION: On 8/17/2017 By ANC

A 1.0 gram, adult, female, Strawberry poison dart frog is necropsied on 17 August 2017 after being found dead. The carcass is in good postmortem condition and poor body condition with no appreciable fat bodies. The spleen is slightly enlarged. The ovaries contain many vitellogenic follicles, some of which appear to be free in the coelomic cavity (possible postmortem artifact). The eyes, heart, liver, kidneys and digestive tract are grossly unremarkable.

GROSS DIAGNOSIS: By ANC

No significant gross lesions identified

LABORATORY STUDIES:

TISSUE STATUS:

SHELVED:	False
TRIMMED:	True
FROZEN:	False
ULTRAFROZEN:	True

Tissues Ultrafrozen: Liver

SPECIAL REQUESTS: On By

HISTOLOGY: On 8/31/2017 By ANC

1. HEART; TRACHEA; THYROID; DIGESTIVE TRACT; LIVER; KIDNEY; SPLEEN; OVARY; OVIDUCT
2. HEAD; SPINE; FEET

MORPHOLOGIC DIAGNOSIS:

1) Liver: Melanomacrophage center hyperplasia and hepatic cord atrophy
2) Body as a whole: Poor body condition with empty digestive tract

REMARKS: On 8/31/2017 By ANC

8/31/17: A cause for this frog's death was not identified as there were no significant gross or histologic lesions present. Hepatic changes and body condition suggest negative caloric balance indicative of a chronic disease progression.

ANC	Andrew Cartoceti	8/31/2017
PROSECTOR	PATHOLOGIST	DATE COMPLETED

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Pathology Module - Final Pathology Report
NATIONAL ZOOLOGICAL PARK

PATH # N2017-0178

Death Date: 8/16/2017
Necropsy Date: 8/17/2017

BOMBINA ORIENTALIS
Oriental fire-bellied toad
Name:

Gender: Unknown Sex
Age:

Accession No.: 305252
Birth:
Acquired: 20 Jul 1987
13 Jul 2016

SEX: Unknown Sex AGE: ADULT WEIGHT: 18.5 gm STAY: > 30 Days

MANNER OF DEATH: Found Dead
TIME OF DEATH:
DEATH LOCATION: F line exhibit
SUBMITTOR: MM
OWNER/ANIMAL DEPT: DOH

INTERVAL: 24-48 Hours
XRAYED: False
DISPOSITION: Formalin
PROSECTOR: ANC

HISTORY AND CLINCICAL OBSERVATIONS:

KEEPER OBSERVATIONS: On 8/17/2017 By ME

A dead adult fire bellied toad , group number 305252 was found dead on exhibit late this afternoon. It was not seen during am checks. The toad appears otherwise normal.

CLINICIAN OBSERVATIONS: On By

GROSS DESCRIPTION: On 8/17/2017 By ANC

A 18.5 gram, adult, male, fire-bellied toad is necropsied on 17 August 2017 after being found dead. The carcass is in good postmortem condition and good body condition with well-fleshed muscles and moderately-sized fat bodies. There is generalized swelling and edema of the tongue, body and limbs due to accumulation of watery, clear fluid. The corneas are bilaterally cloudy. The coelomic cavity contains excess clear watery fluid. The lungs are bilaterally collapsed. Diffusely, the liver has a finely nodular and pale grey appearance. The stomach contains a small amount of mucoid to pasty pale tan ingesta. The heart, pancreas, spleen, kidneys, testes, urinary bladder and digestive tract are grossly unremarkable.

GROSS DIAGNOSIS: By ANC

Subcutis, body, limbs: Anasarca
Coelomic cavity: Hydrocoelom
Tongue: Severe edema

LABORATORY STUDIES:

TISSUE STATUS

SHELVED:	False
TRIMMED:	True
FROZEN:	False
ULTRAFROZEN:	True

Tissues Ultrafrozen: Liver

SPECIAL REQUESTS: On By

HISTOLOGY: On 9/1/2017 By ANC

1. LIVER; KIDNEY; TESTIS; FAT BODY; SPLEEN; PANCREAS; LUNG
2. TONGUE; LARYNX; ESOPHAGUS; STOMACH; INTESTINE; PANCREAS; HEART
3. HEAD, EYES, BRAIN; FEET

MORPHOLOGIC DIAGNOSIS:

1) Multiple tissues (see comment): Disseminated lymphosarcoma
2) Subcutaneous lymph sacs: Lymphangiectasia
3) Lung: Pulmonary edema
4) Testes: Spermatogenesis
5) Skin, eyes: Superficial oomycete hyphal elements

REMARKS: On 9/1/2017 By ANC

9/1/17: Histology revealed lymphosarcoma to be the cause of death and anasarca. Lymphosarcoma is widely distributed, including in most visceral organs (lungs, heart, liver, kidney, spleen, pancreas, fat bodies, digestive tract) as well as the larynx, skeletal muscle, subcutis, subcutaneous lymph sacs and

skin. Neoplastic infiltrates in the kidney and liver have resulted in considerable renal tubular and hepatic cord degeneration, which may have caused renal and liver failure contributing (along with neoplastic obstruction of lymphatics) to anasarca. Oomycete growth is presumed to be postmortem overgrowth.

ANC	Andrew Cartoceti	9/1/2017
PROSECTOR	PATHOLOGIST	DATE COMPLETED

Pathology Module - Final Pathology Report
NATIONAL ZOOLOGICAL PARK

PATH # N2017-0179

Death Date: 8/18/2017
Necropsy Date: 8/18/2017

HYPHESSOBRYCON SOCOLOFI
Lesser bleeding heart tetra
Name:

Gender: Unknown Sex
Age:

Accession No.: 500820
Birth:
Acquired: 11 Feb 2015
01 Jul 2016

SEX: Unknown Sex AGE: ADULT WEIGHT: 0 gm STAY:

MANNER OF DEATH: Found Dead
TIME OF DEATH:
DEATH LOCATION: Pool 4
SUBMITTOR: HC
OWNER/ANIMAL DEPT: DOA

INTERVAL: 0-6 hours
XRAYED: False
DISPOSITION: Formalin
PROSECTOR: Andrew Cartoceti

HISTORY AND CLINCICAL OBSERVATIONS:

KEEPER OBSERVATIONS: On 8/18/2017 By HC

0.0.1 Bleeding heart tetra found in strainer basket during AM cleaning. Specimen in good condition, clear eyes and no obvious trauma to body mass. This pool is a large mixed species exhibit, previously declared mycobacteria (+). All tankmates appear BAR.

CLINICIAN OBSERVATIONS: On By

GROSS DESCRIPTION: On 8/18/2017 By ANC

Received is a bleeding heart tetra for necropsy on 18 August 2017 after being found dead. The carcass is in faira postmortem condition. The fish is placed whole in formalin to aid in histologic processing.

GROSS DIAGNOSIS: By ANC

No significant external lesions identified

LABORATORY STUDIES:

TISSUE STATUS:

SHELVED:	False
TRIMMED:	True
FROZEN:	False
ULTRAFROZEN:	False

Tissues Ultrafrozen:

SPECIAL REQUESTS: On By

HISTOLOGY: On 9/5/2017 By ANC

1. HEAD, BRAIN, EYES; BODY, ANTERIOR KIDNEY, HEART, GILLS, LIVER, INTESTINE
2. BODY, POSTERIOR KIDNEY, SWIM BLADDER, LIVER, OVARY, TESTES, DIGESTIVE TRACT

MORPHOLOGIC DIAGNOSIS:

1) Anterior kidney: Focal granuloma
2) Gonads: Ovarian and testicular tissue (true hermaphrodism)
3) Liver: Diffuse macrovesicular vacuolar hepatopathy (lipid-type)

REMARKS: On 9/5/2017 By ANC

9/5/17: A cause of death was not established based on histology. The presence of a single granuloma in the posterior kidney is suggestive of mycobacterial infection, but the significance of infection is unknown as the viscera were not widely or severely affected as is typically the case in fatal mycobacteriosis. This fish had both testicular and ovarian tissue, making it a true hermaphrodite. Vacuolar hepatopathy (presumptive lipidosis) is consistent with terminal anorexia. There was marked autolysis obscuring the architecture of many organs.

Andrew Cartoceti	ANC	9/5/2017
PROSECTOR	PATHOLOGIST	DATE COMPLETED

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Pathology Module - Final Pathology Report
NATIONAL ZOOLOGICAL PARK

PATH # N2017-0180

Death Date: 8/18/2017
Necropsy Date: 8/21/2017

NEMATOBRYCON PALMERI
Emperor tetra
Name:

Gender: Unknown Sex
Age:

Accession No.: 500875
Birth:
Acquired: 03 May 2016

SEX: Unknown Sex AGE: ADULT WEIGHT: 0 gm STAY:

MANNER OF DEATH: Found Dead
TIME OF DEATH: 08:00
DEATH LOCATION: FSA5
SUBMITTOR: Ed Smith
OWNER/ANIMAL DEPT: DOA

INTERVAL: 24-48 Hours
XRAYED: False
DISPOSITION: Formalin
PROSECTOR: ANC

HISTORY AND CLINCICAL OBSERVATIONS:

KEEPER OBSERVATIONS: On 8/19/2017 By ES

0.0.1 emperor tetra , likely overnight death - highly decomposed - previously declared mycobacteria (+).

CLINICIAN OBSERVATIONS: On By

GROSS DESCRIPTION: On 8/21/2017 By ANC

An unknown sex, adult, Emperor tetra is necropsied on 21 August 2017 following being found dead. The carcass is in poor postmortem condition with the majority of the body wall and internal viscera absent. The remains are placed whole in formalin.

GROSS DIAGNOSIS: By ANC

Advanced autolysis

LABORATORY STUDIES:

TISSUE STATUS:

SHELVED:	False
TRIMMED:	False
FROZEN:	False
ULTRAFROZEN:	False

Tissues Ultrafrozen:

SPECIAL REQUESTS: On By

HISTOLOGY: On 9/5/2017 By ANC

1. HEAD, BRAIN; BODY, LIVER, KIDNY, DIGESTIVE TRACT

MORPHOLOGIC DIAGNOSIS:

1) Liver, kidney: Granulomatosis within intralesional bacteria (suspect Mycobacteriums sp.)

REMARKS: On 9/5/2017 By ANC

9/5/17: The histologic findings are strongly suggestive of mycobacteriosis as the cause of death. Due to the history of mycobacterium in this tank, confirmation via special stain will not be performed.

ANC	Andrew Cartoceti	9/5/2017
PROSECTOR	PATHOLOGIST	DATE COMPLETED

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Pathology Module - Final Pathology Report
NATIONAL ZOOLOGICAL PARK

PATH # N2017-0181

Death Date: 8/24/2017
Necropsy Date: 8/24/2017

PARACHEIRODON INNESI
Neon tetra
Name:

Gender: Unknown Sex
Age:

Accession No.: 500866
Birth:
Acquired: 15 Sep 2015
31 Dec 2016

SEX: Unknown Sex AGE: ADULT WEIGHT: 0 gm STAY:

MANNER OF DEATH: Found Dead
TIME OF DEATH: 08:30
DEATH LOCATION: Pool 3
SUBMITTOR: Lando McCall
OWNER/ANIMAL DEPT: DOA

INTERVAL: 6-24 hours
XRAYED: False
DISPOSITION: Formalin
PROSECTOR: Andrew Cartoceti

HISTORY AND CLINCICAL OBSERVATIONS:

KEEPER OBSERVATIONS: On 8/24/2017 By LM

Fish was found against side of strainer mesh during Pool 3 cleaning by H. Colton. Body in good condition.

CLINICIAN OBSERVATIONS: On By

GROSS DESCRIPTION: On 9/5/2017 By ANC

An adult neon tetra is necropsied on 24 August 2017 following being found dead. The fish is fixed in formalin in toto to aid in histologic processing.

GROSS DIAGNOSIS: By ANC

No external gross lesions noted

LABORATORY STUDIES:

TISSUE STATUS:

SHELVED:	False
TRIMMED:	True
FROZEN:	False
ULTRAFROZEN:	False

Tissues Ultrafrozen:

SPECIAL REQUESTS: On By

HISTOLOGY: On 9/5/2017 By ANC

1. WHOLE BODY, LONGITUDINAL, EYE, BRAIN, GILLS, HEART

MORPHOLOGIC DIAGNOSIS:

1) Heart: Myxomatous endocardial proliferation
2) Skin: Abundant superficial oomycete hyphae

REMARKS: On 9/5/2017 By ANC

9/5/17: Histology of the viscera was limited to the eye, brain, gills and heart due to processing/sectioning artifact. The only significant finding on limited histology was a proliferative mass within the endocardium resmbling that found in a tankmate (N17-0096). Differential diagnoses for this lesion include endocardiosis and cardiac myxoma/myxosarcoma. This mass fills approximately 30% of one chamber (suspected atrium) and may have caused clinically significant cardiac insufficiency. Oomycete hyphal elements in the skin are likely postmortem overgrowth.

Andrew Cartoceti	Andrew Cartoceti	9/5/2017
PROSECTOR	PATHOLOGIST	DATE COMPLETED

Printed on: 9/5/2017 2:13:24 PM CARES-MED v2.119

Pathology Module - Final Pathology Report
NATIONAL ZOOLOGICAL PARK

PATH # N2017-0182

Death Date: 8/26/2017
Necropsy Date: 8/26/2017

PARACHEIRODON INNESI
Neon tetra
Name:

Gender: Unknown Sex
Age:

Accession No.: 500866
Birth:
Acquired: 15 Sep 2015
31 Dec 2016

SEX: Unknown Sex AGE: ADULT WEIGHT: 0.6 gm STAY: > 30 Days
MANNER OF DEATH:Found Dead INTERVAL:6-24 hours
TIME OF DEATH:08:00 XRAYED:False
DEATH LOCATION:Pool 3 DISPOSITION:IN FORMALIN
SUBMITTOR:Hilary Colton, AMZ PROSECTOR:Clippinger
OWNER/ANIMAL DEPT:DOA

HISTORY AND CLINCICAL OBSERVATIONS:

KEEPER OBSERVATIONS: On 8/26/2017 By HC

Found dead by LFStaff at 0800 in the strainer basket. Healthy tank. Tankmates all BAR.

CLINICIAN OBSERVATIONS: On 8/26/2017 By TLC

Prosector note - Carcass presented at 15:50 due to lack of internet for the form per submitter -- maintained in refrigerator at AMZ after Life Support Staff found it in the morning.

GROSS DESCRIPTION: On 8/26/2017 By tlc

A 0.6 gram, adult, unknown sex, neon tetra is necropsied on 26 August 2017 after being found dead in the skimmer basket of Pool 3 by the Life Support Staff in the morning. The fish was presented more than 7 hours after found and the carcass was refrigerated until presentation. The fish has a total length of 3.2 cm and the tip of the tail fork is absent. The carcass is in very poor postmortem condition. The fish appears to be slightly thin in comparison to others observed alive. Severe autolysis is evident. The eyes within the socket are sunken. The carcass is placed into 10% formalin for histology.

GROSS DIAGNOSIS: By

LABORATORY STUDIES:

TISSUE STATUS:

SHELVED:	False
TRIMMED:	True
FROZEN:	False
ULTRAFROZEN:	False

Tissues Ultrafrozen:

SPECIAL REQUESTS: On By

HISTOLOGY: On 9/7/2017 By KAH

1. BISECTED BODY

MORPHOLOGIC DIAGNOSIS:

1) Multiple organs: Granulomas consistent with mycobacteriosis.
2) Body as a whole: Severe autolysis

REMARKS: On 9/7/2017 By KAH

There are abundant granulomas in multiple locations, consistent with mycobacteriosis as seen in other cases from this tank.

Clippinger	Holder	9/7/2017
PROSECTOR	PATHOLOGIST	DATE COMPLETED

Printed on: 9/7/2017 2:57:58 PM CARES-MED v2.119

Pathology Module - Final Pathology Report
NATIONAL ZOOLOGICAL PARK

PATH # N2017-0183

Death Date: 8/27/2017
Necropsy Date: 8/27/2017

HETERODON NASICUS (no subsp)
Western hognose snake
Name:

Gender: Male
Age: 1Y 5M 12D

Accession No.: 307675
Birth: 15 Mar 2016
Acquired: 18 Aug 2017
Removed: 27 Aug 2017

SEX: Male | AGE: 1Y 5M 12D | WEIGHT: 0.051 gm | STAY: <= 30 Days

MANNER OF DEATH:Found Dead
TIME OF DEATH:03:00
DEATH LOCATION:WHS -quarantine
SUBMITTOR:Kendra Bauer- WHS
OWNER/ANIMAL DEPT:DAH

INTERVAL:0-6 hours
XRAYED:True
DISPOSITION:INCINERATE
PROSECTOR:Clippinger

HISTORY AND CLINCICAL OBSERVATIONS:

KEEPER OBSERVATIONS: On By

CLINICIAN OBSERVATIONS: On 8/27/2017 By KLB

his animal arrive in quarantine on 8/18 from a private breeder. This animal has not eaten since arriving in quarantine. The animal has a ~6 day history of cloacal discharge that appeared to be normal scent gland material mixed with blood. An empiric treatment course with meloxicam and ceftazidime was initiated on 8/25. No discharge was noted for the past two days. The animal was noted by keepers to be active this morning but was deceased at the afternoon check. A surviving conspecific is housed separately and has not had similar clinical signs.

Clinical note from 8/24/17 [JCS] History - 3 day history of abnormal discharge noted on the floor of the cage. Discharge is a combination of brown to red tinge. No evidence of cloacal or oral discharge noted by keeper staff and snake has refused previous two meals. One pinkie mouse was fed in the AM after thawing with warm water on 8/22 and another warmed pinkie was fed yesterday 8/23 but no interest noted by either snakes. Snake is otherwise BAR moving around well.
Restraint - Manual; EENT - WNL, eyes were clear and oral exam showed no blood, excess mucus or stomatitis present. ; Coelomic palpation - WNL, during caudal coelomic palpation and proximal tail palpation a large amount; of brown viscous fluid was removed with the right side being harder to express and the scent gland; material was firmer.; Cloacal exam showed no evidence of blood present in the distal cloaca; Sexing confirmed male.
Blood draw from the ventral tail vein was attempted, but unsuccessful.
A - Suspected impacted right scent gland.
P - Continue daily updates from keeper staff and if discharge continues discuss full exam under anesthesia for diagnostics (radiographs, cloacal flush, cardiocentesis for CBC/Chemistry panels, +/- kidney aspirate.

GROSS DESCRIPTION: On 8/27/2017 By TLC

The carcass of a juvenile male Western hognose snake is presented for necropsy on 27 August 2017. The carcass is room temperature and presented within 45 minutes of being found in good postmortem condition. The body weight is 50.3gm and the carcass is 49.6cm in length. Upon opening the coelom, pink-tinged fluid was observed in the caudal coelom near the rectum and its source is unknown. The fluid is swabbed with a culturette that is saved for potential culture, if indicated. Nutritional condition is good based on a moderate amount of subcutaneous and body cavitary fat stores. The nares, trachea, bronchi, lungs and heart are unremarkable. The stomach is empty. The remainder of the intestinal tract is grossly normal. The liver is pale brown with sharp edges. The spleen, gallbladder, testes, tongue, skeleton, musculature, and eyes all appear grossly normal. The caudal kidney seems more reddened than the cranial kidney. The ventral integument has an irregular pattern approximately 5cm from the snout; this area is dissected from underlying tissue and the remaining skin covering and placed in total into a bag in the formalin container. The scent gland region is dissected from the carcass maintaining attachment of the brown ventral scutes for orientation. The right scent gland region seems darker in coloration than the left region. There is a darker portion of the right scent gland/hemipene region approximately 46mm from the vent that appears be different from the appearance of the left region. The soft tissue over the right heminpene/scent gland region is incised. A swab is taken immediately of that region and it is saved for potential culture, if indicated. A portion of the right hemipene/scent gland region is removed to be saved as frozen tissue. The culturette swab is also touched to the tip of this right hemipene/scent gland. After an eye is removed, cuts are made into the musculature and skull base overlying the brain and the head is placed in total into the formalin container.
No other abnormalities are seen. Histopathology is pending.

GROSS DIAGNOSIS: By KAH

1) Skin: Dermatitis, focal, moderate.
2) Kidney: Congestion

LABORATORY STUDIES:

CULTURE: saved swabs 1) pink-tinged fluid in caudal coelom 2) right scent gland

TISSUE STATUS:

SHELVED:	False
TRIMMED:	True
FROZEN:	True
ULTRAFROZEN:	False

Tissues Ultrafrozen:

SPECIAL REQUESTS: On By

HISTOLOGY: On 9/7/2017 By KAH

1. SKIN LESIONS (Special stains: Fite's, PAS, GMS)
2. TAIL LESIONS
3. KIDNEY, LIVER, PANCREAS
4. LUNG, HEART, EYE
5. GI, SCENT GLAND, TESTIS
6. TRACHEA, GI

MORPHOLOGIC DIAGNOSIS:

1) Neck skin: Dermatitis, exudative and heterophilic, with caseous foci and abundant intralesional bacteria.
2) Scent glands: Adenitis, necrotizing and heterophilic, severe, with inspissated glandular product, intralesional bacteria and spermatozoa.
3) Cloaca: Cloacitis, heterophilic and lymphocytic, severe.
4) Great vessels: Thrombosis and mixed perivasculitis.
5) Arteries: Arterioclerosis, moderate.

REMARKS: On 9/7/2017 By KAH

The inflamed scent glands may have initiated the cloacitis seen histologically. Thrombosis is a large vessel may indicate that this animal was septic or at least hypercoagulable. The kidneys had abundant seasonal reproductive development, and sperm production was also clearly in evidence, potentially contributing to systemic stress.
The skin lesion has a prominent bacterial component, but there are some areas suspicious for fungal involvement. Special stains are pending, and an addendum will be added as new information is gained.

Addendum, 21 September, 2017, Special stain results: No evidence of Ophidiomyces on GMS or PAS. No acid fast organisms on Fite's.

Clippinger	Holder	9/7/2017
PROSECTOR	PATHOLOGIST	DATE COMPLETED

Pathology Module - Final Pathology Report
NATIONAL ZOOLOGICAL PARK

PATH # N2017-0184

Death Date: 8/29/2017
Necropsy Date: 8/29/2017

NEMATOBRYCON PALMERI
Emperor tetra
Name:

Gender: Unknown Sex
Age:

Accession No.: 500875
Birth:
Acquired: 03 May 2016

SEX: Unknown Sex AGE: ADULT WEIGHT: 2.5 gm STAY:

MANNER OF DEATH:Found Dead
TIME OF DEATH:
DEATH LOCATION:FSA5
SUBMITTOR:Ed Smith
OWNER/ANIMAL DEPT:DOA

INTERVAL:0-6 hours
XRAYED:False
DISPOSITION:ALL IN FORMALIN
PROSECTOR:Holder

HISTORY AND CLINCICAL OBSERVATIONS:

KEEPER OBSERVATIONS: On 8/29/2017 By ES

0.0.1 emperor tetra , swimming weakly at surface, expired when netted out - this tank has previously been declared mycobacteria (+).

CLINICIAN OBSERVATIONS: On By

GROSS DESCRIPTION: On 8/29/2017 By KAH

Presented for necropsy is an adult, 2.5 g emperor tetra in good body condition. Postmortem condition is moderately autolyzed. There is blood noted on the right ventral body wall. The viscera are removed and the entire carcass is placed in formalin.
No other abnormalities are seen.

GROSS DIAGNOSIS: By

LABORATORY STUDIES:

TISSUE STATUS:

SHELVED:	False
TRIMMED:	True
FROZEN:	False
ULTRAFROZEN:	False

Tissues Ultrafrozen:

SPECIAL REQUESTS: On By

HISTOLOGY: On 9/8/2017 By KAH

1. HEAD, GILLS, HEART, SPINE
2. VISCERA

MORPHOLOGIC DIAGNOSIS:

1) Multiple organs: Granulomas consistent with mycobacteriosis.

REMARKS: On 9/8/2017 By KAH

There are abundant granulomas in multiple locations, consistent with mycobacteriosis as seen in other cases from this tank.

Holder	Holder	9/8/2017
PROSECTOR	PATHOLOGIST	DATE COMPLETED

Printed on: 9/8/2017 1:37:04 PM CARES-MED v2.119

Pathology Module - Final Pathology Report
NATIONAL ZOOLOGICAL PARK

PATH # N2017-0185

Death Date: 9/1/2017
Necropsy Date: 9/1/2017

EUDOCIMUS RUBER
Scarlet ibis
Name:

Gender: Unknown Sex
Age: 0Y 0M 0D

Accession No.: 216640
Birth: 01 Sep 2017
Acquired:
Removed: 01 Sep 2017

SEX: Unknown Sex AGE: 0Y 0M 0D WEIGHT: 34.7 gm STAY:

MANNER OF DEATH: Found Dead
TIME OF DEATH:
DEATH LOCATION: BH38
SUBMITTOR: Talbott
OWNER/ANIMAL DEPT: DOO

INTERVAL: Not recorded
XRAYED: False
DISPOSITION: Formalin
PROSECTOR: Andrew Cartoceti

HISTORY AND CLINCICAL OBSERVATIONS:

KEEPER OBSERVATIONS: On 9/1/2017 By DB

#317

CLINICIAN OBSERVATIONS: On By

GROSS DESCRIPTION: On 9/1/2017 By ANC

A 34.7 gram, in ovo, unknown sex, scarlet ibis (#317) is necropsied on 1 September 2017 after being found dead several days after pipping. The egg is 5.3 cm long and 12.4 cm in widest circumference. Below the air cell, there is a ~2 cm diameter hole in the shell through which a ruptured yolk sac is visualized (clinician examination). The carcass is in fair to poor postmortem condition with a putrid odor and friability to the tissues. The chick is stage 44 to 45 and is positioned correctly with the head beneath the right wing and the beak pointing toward the air cell in the wider end of the egg. The skin/subcutis of the head is swollen, wet and gelatinous. The liver is pale tan. The chick is placed in formalin in toto.

GROSS DIAGNOSIS: By ANC

Late embryonic death, stage 44 to 45
Skin and subcutis, head: Diffuse swelling

LABORATORY STUDIES:

TISSUE STATUS:

SHELVED:	False
TRIMMED:	True
FROZEN:	False
ULTRAFROZEN:	False

Tissues Ultrafrozen:

SPECIAL REQUESTS: On By

HISTOLOGY: On 9/21/2017 By ANC

1. YOLK SAC
2. NECK, ESOPHAGUS, TRACHEA
3. THORAX, ESOPHAGUS, LUNG, HEART, PROVENTRICULUS, LIVER, KIDNEY
4. ABDOMEN, VENTRICULUS, INTESTINE, KIDNEY, LIVER, GALLBLADDER
5. ABDOMEN, UMBILICUS, VENTRICULUS, INTESTINE, KIDNEY
6. HEAD, BRAIN
7. HEAD, EYES, NASAL CAVITY

MORPHOLOGIC DIAGNOSIS:

1) Body as a whole: Diffuse edema (see comment)

REMARKS: On 9/21/2017 By ANC

9/21/17: Edema remains the only gross or histological finding. Although this may be a postmortem change due to vascular leakiness in a chick with significant autolysis, the possibility of antemortem fluid retention due to inadequate environmental conditions (i.e. increased humidity during incubation) cannot be ruled out. Review of the incubation parameters are recommended. There was no evidence of underlying infection or vascular disease.

Andrew Cartoceti	Andrew Cartoceti	9/21/2017
PROSECTOR	PATHOLOGIST	DATE COMPLETED

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Pathology Module - Final Pathology Report
NATIONAL ZOOLOGICAL PARK

PATH # N2017-0186

Death Date: 9/2/2017
Necropsy Date: 9/2/2017

CETOPSIS COECUTIENS
Catfish
Name:

Gender: Unknown Sex
Age:

Accession No.: 500841
Birth:
Acquired: 09 Apr 2015

SEX: Unknown Sex AGE: ADULT WEIGHT: 40 gm STAY:

MANNER OF DEATH: Died
TIME OF DEATH: 10:00
DEATH LOCATION: FSA7
SUBMITTOR: Ed Smith
OWNER/ANIMAL DEPT: DOA

INTERVAL: 0-6 hours
XRAYED: False
DISPOSITION: Formalin
PROSECTOR: James C Steeil

HISTORY AND CLINCICAL OBSERVATIONS:

KEEPER OBSERVATIONS: On 9/2/2017 By ES

fish found lying on its side during tank check. Dr Steeil made a visual assessment and recommended move to isolation tank. during this time a tank mate bit off a portion of the caudal fin. Fish expired during transfer to isolation tank.

CLINICIAN OBSERVATIONS: On By

GROSS DESCRIPTION: On 9/2/2017 By ANC

A 40 gram, adult, unknown sex, blue whale catfish is necropsied on 2 September 2017. The fish has a total length of 15.5 cm and is in good postmortem condition and fair body condition with well fleshed skeletal muscles but inapparent adipose stores. The ventral portion of the tail fin is absent and tattered skin partially covers exposed fin rays (tankmate aggression) and there is a small (~0.5 cm diameter) abrasion on the rostrum. There are multiple pinpoint red discolorations in the skin. The carcass is fixed in formalin in toto following an incision of the ventral midline. Following fixation, the viscera were examined and the brain, gills, kidney, heart, liver, gonads and digestive tract were grossly unremarkable.

GROSS DIAGNOSIS: By ANC

Tail fin: Ventral laceration
Skin, rostrum: Mild abrasion

LABORATORY STUDIES:

TISSUE STATUS:

SHELVED:	False
TRIMMED:	True
FROZEN:	False
ULTRAFROZEN:	False

Tissues Ultrafrozen:

SPECIAL REQUESTS: On By

HISTOLOGY: On 9/21/2017 By ANC

1. GILL
2. POSTERIOR KIDNEY; LIVER; HEART; BRAIN
3. SMALL INTESTINE; LARGE INTESTINE; DIGESTIVE TRACT; LIVER; PANCREAS
4. STOMACH; SMALL INTESTINE; PANCREAS; SPLEEN
5. LARGE INTESTINE; TESTIS; SWIM BLADDER
6. PEDUNCLE
7. PEDUNCLE
8. ROSTRUM, OLFACTORY ORGAN

MORPHOLOGIC DIAGNOSIS:

1) Skin, rostrum: Focally extensive, peracute, ulceration

REMARKS: On 9/21/2017 By ANC

9/21/17: Histology did not reveal any underlying disease that might explain this fish's abnormal swimming or that might have predisposed this fish to tankmate aggression. Based on the lack of inflammation in the skin of the rostrum, the abrasion/ulceration likely occurred shortly before death.

This fish is a male.

James C Steeil	Andrew Cartoceti	9/21/2017
PROSECTOR	PATHOLOGIST	DATE COMPLETED

Pathology Module - Final Pathology Report
NATIONAL ZOOLOGICAL PARK

PATH # N2017-0187

Death Date: 9/2/2017
Necropsy Date: 9/3/2017

MONOCIRRHUS POLYACANTHUS
Amazon leaffish
Name:

Gender: Unknown Sex
Age:

Accession No.: 500886
Birth:
Acquired: 01 Sep 2017

SEX: Unknown Sex AGE: ADULT WEIGHT: 1.5 gm STAY:

MANNER OF DEATH: Found Dead
TIME OF DEATH: 15:00
DEATH LOCATION: AFQ7
SUBMITTOR: Ed Smith
OWNER/ANIMAL DEPT: DOA

INTERVAL: 6-24 hours
XRAYED: False
DISPOSITION: Formalin
PROSECTOR: James C Steeil

HISTORY AND CLINCICAL OBSERVATIONS:

KEEPER OBSERVATIONS: On 9/2/2017 By ES

fish found dead during end of day check / tan care

CLINICIAN OBSERVATIONS: On By

GROSS DESCRIPTION: On 9/5/2017 By ANC

A 1.5 gram, adult, unknown sex, Amazon leaf fish is necropsied on 3 September 2017 after being found dead. The fish has a total length of 4.8 cm and is in fair postmortem condition with partial liquefaction of viscera. The carcass is fixed in formalin in toto following an incision of the ventral midline.

GROSS DIAGNOSIS: By ANC

No significant gross lesions identified

LABORATORY STUDIES:

TISSUE STATUS:

SHELVED:	False
TRIMMED:	True
FROZEN:	False
ULTRAFROZEN:	False

Tissues Ultrafrozen:

SPECIAL REQUESTS: On By

HISTOLOGY: On 9/20/2017 By ANC

1. HEAD, EYES, BRAIN, GILL, HEART, LIVER, POSTERIOR KIDNEY, SWIM BLADDER, INTESTINE, BODY WALL
2. BODY, BODY WALL, SWIM BLADDER, DIGESTIVE TRACT, POSTERIOR KIDNEY, LIVER

MORPHOLOGIC DIAGNOSIS:

1) Skeletal muscle, body wall: Moderate to severe, multifocal to regionally extensive, necrotizing and histiocytic myositis with intralesional organisms
2) Stomach: Focal chronic mural granuloma with intralesional foreign material

REMARKS: On 9/20/2017 By ANC

9/19/17: Based on the morphology of the organisms (clear, ovoid, approximately 3 x 6 um with a polar body and larger ~8 um diameter cysts containing multiple spores in the sarcoplasm of the myocytes) and the affinity of organisms for the skeletal muscle, a microsporidian is highly suspected. Further identification would require electron microscopy. The granuloma within the stomach is incidental and likely due to small amounts of ingesta that have penetrated the wall.

James C Steeil	Andrew Cartoceti	9/20/2017
PROSECTOR	PATHOLOGIST	DATE COMPLETED

Printed on: 9/20/2017 10:11:13 AM CARES-MED v2.119

Pathology Module - Final Pathology Report
NATIONAL ZOOLOGICAL PARK

PATH # N2017-0188

Death Date: 9/8/2017
Necropsy Date: 9/8/2017

PARACHEIRODON AXELRODI
Cardinal tetra
Name:

Gender: Unknown Sex
Age:

Accession No.: 500808
Birth:
Acquired: 20 Oct 2014
01 Jul 2017

SEX: Unknown Sex AGE: ADULT WEIGHT: 0.8 gm STAY:

MANNER OF DEATH: Found Dead
TIME OF DEATH:
DEATH LOCATION: FS 6
SUBMITTOR: Lando McCall
OWNER/ANIMAL DEPT: DOA

INTERVAL: 6-24 hours
XRAYED: False
DISPOSITION: Formalin
PROSECTOR: Andrew Cartoceti

HISTORY AND CLINCICAL OBSERVATIONS:

KEEPER OBSERVATIONS: On 9/8/2017 By LM

Carcass was found deceased among tank vegetation during tank cleaning/water change. Body is whole and in good condition.

CLINICIAN OBSERVATIONS: On By

GROSS DESCRIPTION: On 9/8/2017 By ANC

A 0.8 gram, unknown sex, cardinal tetra is necropsied on 8 September 2017 following being found dead. The fish has a total length of 3.9 cm. The fish is fixed en toto in formalin to aid in histologic processing.

GROSS DIAGNOSIS: By ANC

No gross lesions identified

LABORATORY STUDIES:

TISSUE STATUS:

SHELVED:	False
TRIMMED:	True
FROZEN:	False
ULTRAFROZEN:	False

Tissues Ultrafrozen:

SPECIAL REQUESTS: On By

HISTOLOGY: On 10/5/2017 By ANC

1. WHOLE BODY, BRAIN, EYES, GILLS, HEART, LIVER, KIDNEY, ADRENAL, DIGESTIVE TRACT, OVARY, SWIM BLADDER

MORPHOLOGIC DIAGNOSIS:

1) Liver, kidney, gills: Moderate to severe, multifocal, lymphohistiocytic inflammation with intralesional organisms (suspect protozoa)
2) Liver, kidney, heart: Granulomatosis (suspect Mycobacteriosis)
3) Coelomic cavity: Moderate, multifocal, lymphohistiocytic and heterophilic coelomitis and intracoelomic nematodes

REMARKS: On 10/5/2017 By ANC

10/5/17: Similar to some other recently submitted cardinal tetras from this collection, this fish died due to a dual infection of Mycobacterium and an unidentified protozoa. Based on the staining characteristics of suspected protozoal organisms in the previous case (N17-0153), Mesomycetozoa or Purkinsus sp. were considered possible etiologies. Due to the history of mycobacterium within this tank and the likelihood of this etiology based on consistent histologic lesions, acid-fast staining will not be performed for confirmation. Nematodes are ~40 um in diameter with a thin cuticle without obvious ornamentation and a simple digestive tract. This fish is identified as a female.

Andrew Cartoceti	Andrew Cartoceti	10/5/2017
PROSECTOR	PATHOLOGIST	DATE COMPLETED

Printed on: 10/5/2017 1:19:50 PM CARES-MED v2.119

Pathology Module - Final Pathology Report
NATIONAL ZOOLOGICAL PARK

PATH # N2017-0189

Death Date: 9/11/2017
Necropsy Date: 9/11/2017

GALLIRALLUS OWSTONI
Guam rail
Name:

Gender: Unknown Sex
Age: 0Y 0M 4D

Accession No.: 216643
Birth: 07 Sep 2017
Acquired:
Removed: 11 Sep 2017

SEX: Unknown Sex AGE: 0Y 0M 4D WEIGHT: 12.3 gm STAY: <= 30 Days

MANNER OF DEATH:Found Dead
TIME OF DEATH:05:30
DEATH LOCATION:SCBI-SAF Incubator Room
SUBMITTOR:E. Royer
OWNER/ANIMAL DEPT:DCO

INTERVAL:6-24 hours
XRAYED:True
DISPOSITION:INCINERATE
PROSECTOR:KEH

HISTORY AND CLINCICAL OBSERVATIONS:

KEEPER OBSERVATIONS: On 9/11/2017 By ER

216643
SCBI Egg# 208
Dam: 216577
Sire: 216237
Hatch: 7 September 2017
-Housed indoors with 1.0.2 conspecifics.
-No cage mate aggression observed

216643 was found dead in the isolette on 11 September at 0530. Rigor present. Isolette temperature set to 92F. Dead weight: 12.3g.

On 10 September at 0745, 0.0.1 Guam rail chick 216643 found lying left lateral with head tucked inward (was being brooded by male with 1 other chick present) and largely unresponsive (eyes closed, unable to stand) but still vocalizing. Chick arbitrarily identified as 216643 as the 3 chicks cannot be distinguished from one another. It was removed immediately to an isolette (98F) for supportive care. Dr. Kelly Helmick examined the chick and administered fluid and antibiotic injections SQ. No discharge observed from nares. Dehydrated. Found no pulmonary edema upon auscultation. Yolk sac palpated; about pea size. Chick weighed12.3g at 0750. Chicks condition improved slightly throughout the day. Upon PM exam at 1700, chick was stronger and vocal but remained lethargic and had difficulty standing. Vet staff administered fluids and Meloxicam SQ. At 2030, chick vomited twice. Vomit was dark brown and grainy in appearance (contents looked like very small rocks).

All three chicks had been observed on 9 September at 1730 via camera traps; they appeared BAR, mobile, and were following the sire closely.

CLINICIAN OBSERVATIONS: On 9/11/2017 By KEH

Radiographs/postmortem: small amount of radiodense material in ventriculus, postmortem radiographs otherwise unremarkable.

GROSS DESCRIPTION: On 9/11/2017 By KEH

Postmortem/gross: Empty GIT, intact/clear air sacs, liver pallor, yolk sac dark yellow/brown, distal intestines dark, all other gross exam findings WNL. Whole body in formalin to pathologist.
Swab/liver for a/an cx
Swab/yolk sac for a/an Cx

GROSS DIAGNOSIS: By

LABORATORY STUDIES:

TISSUE STATUS:

SHELVED:	False
TRIMMED:	False
FROZEN:	False
ULTRAFROZEN:	False

Tissues Ultrafrozen:

SPECIAL REQUESTS: On By

HISTOLOGY: On 10/2/2017 By KAH

1. LIVER, LUNG, HEART, VENTRICULUS
2. KIDNEY, INTESTINE, SPLEEN

3. NASAL CAVITY, EYE, BRAIN

MORPHOLOGIC DIAGNOSIS:

1) Heart: Multifocal cardiomyocyte granules
2) Kidney: Tubular dilation with cellular and proteinaceous debris.

REMARKS: On 10/2/2017 By KAH

Food material was not identified in the upper GI tract, potentially indicating diminished parental care and caloric intake. Significance of the dark granules noted in the myocardium is undetermined, but special stains are being pursued in order to identify the material. Differentials include calcium, melanin, mast cell granules, or iron pigment.
Findings between the two chicks submitted were similar.

KEH	KALI HOLDER	10/2/2017
PROSECTOR	PATHOLOGIST	DATE COMPLETED

Pathology Module - Final Pathology Report
NATIONAL ZOOLOGICAL PARK

PATH # N2017-0190

Death Date: 9/11/2017
Necropsy Date: 9/11/2017

GALLIRALLUS OWSTONI
Guam rail
Name:

Gender: Unknown Sex
Age: 0Y 0M 4D

Accession No.: 216642
Birth: 07 Sep 2017
Acquired:
Removed: 11 Sep 2017

SEX: Unknown Sex AGE: 0Y 0M 4D WEIGHT: 0 gm STAY: <= 30 Days
MANNER OF DEATH:Euthanasia INTERVAL:0-6 hours
TIME OF DEATH: XRAYED:False
DEATH LOCATION:SCBI Vet Hospital DISPOSITION:ALL IN FORMALIN
SUBMITTOR:E. Royer PROSECTOR:KEH
OWNER/ANIMAL DEPT:DCO

HISTORY AND CLINCICAL OBSERVATIONS:

KEEPER OBSERVATIONS: On 9/11/2017 By ER

216642; SCBI Egg# 203
Dam: 216577; Sire: 216237; Hatch: 7 September 2017
-Previously housed indoors with 1.0.2 conspecifics before being placed in isolette; 0.0.1 sibling 216643 was found dead at 0530 on 11 Sept in isolette (for supportive care) after having similar symptoms to 216642.
-No cage mate aggression observed
September, chick was found in enclosure making distress vocalizations, showing signs of dyspnea, eyes closed, was uncoordinated and unable to stand. It was removed immediately to an isolette (85F). Produced small, very dry fecal. Regurgitated dark brown liquid, sandy in appearance with small sharp rock present.

CLINICIAN OBSERVATIONS: On 9/11/2017 By KEH

0.0.1 Guam rail chick 216642 was humanely euthanized by vet staff on 11 September at 1500. At 0600 on 11 Dr. K. Helmick administered fluids at 0845. By 1045, it's condition appeared to have worsened; standing (though unstable) with head down and tucked under. Vet staff tube fed 0.5ml solution of canola oil, water, and ground cat chow pellets at 1045 which it later appeared to regurgitate. Despite supportive care and veterinary treatment, the rail's condition continued to decline over the course of the day. Euthanasia was elected based on animal welfare and quality of life concerns. (ER)
Anesthesia: Chamber induction/isoflurane, respirations ceased, unable to find HR, injected 0.025 ml beuthanasia mixed 1:1 with water intracardiac to insure death.

GROSS DESCRIPTION: On 9/11/2017 By KEH

Postmortem/gross: body was opened and examined, clean air sacs, severe hepatic pallor, empty GIT, yolk sac small/normal color, dark tarry feces within distal intestines, all other gross exam findings WNL.
Whole body in formalin to pathologist.
Swab/postmortem liver for a/an cx
Swab/postmortem yolk sac for a/an cx
Slides/smears of lower intestinal contents for cytology

GROSS DIAGNOSIS: By

LABORATORY STUDIES:
CULTURE: Liver and yolk swabs, aerobic and anaerobic

TISSUE STATUS:

SHELVED:	False
TRIMMED:	True
FROZEN:	False
ULTRAFROZEN:	False

Tissues Ultrafrozen:

SPECIAL REQUESTS: On By

HISTOLOGY: On 10/2/2017 By KAH

1. LIVER, LUNG, HEART, PROVENTRICULUS
2. KIDNEY, INTESTINE, SPLEEN, YOLK, ADRENAL
3. NASAL CAVITY, EYE, BRAIN

MORPHOLOGIC DIAGNOSIS:

1) Heart: Multifocal cardiomyocyte granules

REMARKS: On 10/2/2017 By KAH

Food material was not identified in the upper GI tract, potentially indicating diminished parental care and caloric intake. Significance of the dark granules noted in the myocardium is undetermined, but special stains are being pursued in order to identify the material. Differentials include calcium, melanin, mast cell granules, or iron pigment.
Findings between the two chicks submitted were similar.

KEH	Holder	10/2/2017
PROSECTOR	PATHOLOGIST	DATE COMPLETED

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Pathology Module - Final Pathology Report
NATIONAL ZOOLOGICAL PARK

PATH # N2017-0191

Death Date: 9/12/2017
Necropsy Date: 9/12/2017

PSAROCOLIUS DECUMANUS (no subsp) Gender: Female
Crested oropendola Age: 9Y 3M 7D
Name: Chip: 4B07114710

Accession No.: 215841
Birth: 05 Jun 2008
Acquired: 05 Nov 2009
Removed: 12 Sep 2017

SEX: Female AGE: 9Y 3M 7D WEIGHT: 143 gm STAY:

MANNER OF DEATH:Found Dead
TIME OF DEATH:
DEATH LOCATION:BH3/4
SUBMITTOR:Eric Slovak
OWNER/ANIMAL DEPT:DOO

INTERVAL:6-24 hours
XRAYED:False
DISPOSITION:INCINERATE
PROSECTOR:Holder

HISTORY AND CLINCICAL OBSERVATIONS:

KEEPER OBSERVATIONS: On 9/12/2017 By ES

Bird was moved downstairs to basement holding last week to prepare for move to Amazonia. Bird was noted to be sneezing intermittently Monday, September 11th. We had plans to schedule an exam on Tuesday the 12th if the bird was still sneezing. Bird was found deceased near the door of the cage when keepers walked in this morning. Last weight of this bird was 146g on 9-3-2017.

CLINICIAN OBSERVATIONS: On By

GROSS DESCRIPTION: On 9/12/2017 By KAH

Presented for necropsy is an adult female crested oropendola weighing 143 g. Postmortem condition is adequate, though the choana contains ants. Body condition shows minimal subcutaneous or intra-abdominal fat, but muscle mass is adequate. There is a transponder chip which reads 4B07114710 and a green plastic leg band on he left leg. The proventriculus and ventriculus are empty.
Throughout the body cavity air sacs contain yellow caseous material, particularly on the pericardium and within the right abdominal air sac. The plug from the right abdominal air sac is friable, yellow, and occasionally gelatinous, approximately 2.3 cm in diameter.
Skin on the feet is rough and hyperkeratotic.
No other gross abnormalities are noted.

GROSS DIAGNOSIS: By KAH

1. Coelomic cavity: Air sacculitis and peritonitis, caseous, severe.
2. Feet: Pododermatitis, proliferative.

LABORATORY STUDIES:

CULTURE: Sample collected for culture if requested.

TISSUE STATUS:

SHELVED:	False
TRIMMED:	True
FROZEN:	False
ULTRAFROZEN:	True

Tissues Ultrafrozen: liver, kidney, lung, air sac caseous material

SPECIAL REQUESTS: On By

HISTOLOGY: On 10/2/2017 By

1. LIVER, HEART, VENTRICULUS, PROVENTRICULUS
2. KIDNEY, OVARY, LUNG, AIRSAC
3. AIR SAC DEBRIS, GI, PANCREAS, SPLEEN
4. TRACHEA
5. BRAIN
6. NASAL CAVITY, TOE, EYE

MORPHOLOGIC DIAGNOSIS:

1) Air sac: Air sacculitis, fibrinonecrotic to granulomatous, severe, with abundant non-pigmented fungal hyphae.
2) Trachea: Laryngotracheitis, fibrinonecrotic to granulomatous, severe, with chondrolysis, osteolysis, and abundant non-pigmented fungal hyphae.
3) Lung: Pleuropneumonia, heterophilic to granulomatous, multifocal, severe.
4) Toe: Pododermatitis, lymphocytic and proliferative, mild.
5) Nasal cavity: Rhinitis, lymphocytic, mild, with multifocal inspissated glands.
6) Spleen: Lymphoid depletion and endothelial hypertrophy.

REMARKS: On 10/2/2017 By KAH

Fungi in this case had roughly parallel walls, acute to right-angle dichotomous branching, no identified pigmentation, and were approximately 5-10 um in diameter. This is consistent with, though not diagnostic for, aspergillosis. The fungal infection compromised the respiratory system and caused obstruction in the trachea and a space occupying mass in the air sac.

Holder	Holder	10/2/2017
PROSECTOR	PATHOLOGIST	DATE COMPLETED

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Pathology Module - Final Pathology Report
NATIONAL ZOOLOGICAL PARK

PATH # N2017-0192

Death Date: 9/12/2017
Necropsy Date: 9/12/2017

OCTODON DEGUS	Gender: Female	Accession No.: 114995
Degu	Age: 4Y 8M 11D	Birth: 01 Jan 2013
Name: Little Gouda	Chip: 985112000608141	Acquired: 23 Oct 2013
		Removed: 12 Sep 2017

SEX: Female	AGE: 4Y 8M 11D	WEIGHT: 210 gm	STAY:
MANNER OF DEATH: Euthanasia			INTERVAL: 0-6 hours
TIME OF DEATH:			XRAYED: True
DEATH LOCATION: WHS			DISPOSITION: INCINERATE
SUBMITTOR: Kendra Bauer			PROSECTOR: Holder
OWNER/ANIMAL DEPT: DOM - SMH			

HISTORY AND CLINCICAL OBSERVATIONS:

KEEPER OBSERVATIONS: On By

CLINICIAN OBSERVATIONS: On 9/12/2017 By KLB

This animal has a recent history of gradual weight loss over the last 3-4 months. Today, the animal was noted to be limping on the right hind leg and a mass was noted. On exam, there was a firm soft tissue mass with indistinct margins on the lateral aspect of the right thigh with an area of ulceration on the skin. Decreased mobility of the coxofemoral and stifle joints was noted suspected due to muscle contracture. No obvious bony involvement was noted on radiographs. Due to poor quality of life associated with the mass and poor likelihood of success associated with removing it, euthanasia was elected. Euthasol and KCl was administered intracardiac.

GROSS DESCRIPTION: On 9/12/2017 By KAH

Presented for necropsy is an adult female degu weighing 210 g. Postmortem condition is excellent. Body condition is adequate with minimal subcutaneous fat and slight intra-abdominal fat. Stomach contains green mucoid paste. Colon contains formed fecal pellets. There is a transponder chip which reads 985 112000608141.
The right hindlimb is distorted by a rounded, poorly defined, slightly firm, pale subcutaneous mass approximately 2.5 cm in diameter. The surface of the mass is ulcerated in a 1 cm diameter, and the mass bulges slightly on sectioning. The mass wraps around the sciatic nerve and infiltrates the surrounding muscle.
The left kidney has a 2 mm diameter depression in the cortical surface.
No other gross abnormalities are noted.

GROSS DIAGNOSIS: By KAH

1. Leg: Malignant neoplasm, suspect sof tissue sarcoma (ex. peripheral nerve sheath tumor), with ulceration
2. Left kidney: Renal infarct, focal.

LABORATORY STUDIES:

TISSUE STATUS:

SHELVED:	False
TRIMMED:	True
FROZEN:	False
ULTRAFROZEN:	True

Tissues Ultrafrozen: liver, kidney, mass

SPECIAL REQUESTS: On By

HISTOLOGY: On 10/2/2017 By KAH

1. MASS
2. LIVER, HEART, SPLEEN
3. LUNG, TONGUE
4. STOMACH, KIDNEY, PANCREAS
5. GI, ROOT OF MESENTERY
6. BRAIN, EYE

MORPHOLOGIC DIAGNOSIS:

1) Mass: Soft tissue sarcoma
2) Kidney: Bowman's capsule dilation and glomerular sclerosis, deep cortex, moderate.
3) Adrenal: Locally extensive fibrosis, moderate, corticomedullary junction.

4) Lung: Pulmonary edema, moderate.
5) Liver: Lymphoid aggregates, multifocal, rare.
6) Colon: Lymphoid hyperplasia, gut-associated lymphoid tissue, marked.

REMARKS: On 10/2/2017 By KAH

The sarcoma in this animal is composed of densely-packed spindle cells with multifocal areas of myxomatous differentiation and occasional fatty vacuoles. The mitotic rate is not particularly high (5-7/10 HPFs), which is not unusual for soft tissue sarcomas. Necrosis, giant cell formation, and invasiveness were also noted and are supportive of malignant biological behavior. Cell of origin is undetermined, but fibrosarcoma or peripheral nerve sheath tumor are considered most likely, with the possibility of rhabdomyosarcoma as a distant third. If more specific differentiation is desired, the case can be sent out for IHC to attempt to identify cell of origin. Please contact pathology to pursue this avenue.

Holder	Holder	10/2/2017
PROSECTOR	PATHOLOGIST	DATE COMPLETED

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Pathology Module - Final Pathology Report
NATIONAL ZOOLOGICAL PARK

PATH # N2017-0193

Death Date: 9/15/2017
Necropsy Date: 9/15/2017

PARACHEIRODON AXELRODI
Cardinal tetra
Name:

Gender: Unknown Sex
Age:

Accession No.: 500808
Birth:
Acquired: 20 Oct 2014
31 Dec 2016

SEX: Unknown Sex AGE: ADULT WEIGHT: 0 gm STAY:
MANNER OF DEATH:Found Dead INTERVAL:6-24 hours
TIME OF DEATH: XRAYED:False
DEATH LOCATION:FSA6 DISPOSITION:ALL IN FORMALIN
SUBMITTOR:Christina Castiglione PROSECTOR:Holder
OWNER/ANIMAL DEPT:DOA

HISTORY AND CLINCICAL OBSERVATIONS:

KEEPER OBSERVATIONS: On 9/15/2017 By CC

0.0.1 Cardinal Tetra (500808) was found deceased behind water input tube in FSA6.

CLINICIAN OBSERVATIONS: On By

GROSS DESCRIPTION: On 9/15/2017 By KAH

Presented for necropsy is an adult cardinal tetra. The entire carcass is incised and placed whole in formalin.

GROSS DIAGNOSIS: By

LABORATORY STUDIES:

TISSUE STATUS:

SHELVED:	False
TRIMMED:	True
FROZEN:	False
ULTRAFROZEN:	False

Tissues Ultrafrozen:

SPECIAL REQUESTS: On By

HISTOLOGY: On 10/2/2017 By KAH

1. LIVER, GI
2. HEAD KIDNEY, GILLS, EYE, BRAIN

MORPHOLOGIC DIAGNOSIS:

1) Body as a whole: Severe autolysis
2) Multiple organs: Granulomas consistent with mycobacteriosis.

REMARKS: On 10/2/2017 By KAH

Autolysis in this case was severe and may have obscured relevant diagnostic lesions. Despite this, granulomas were identifiable in a few organs. Due to tank history, mycobacteriosis is strongly suspected.

Holder	Holder	10/2/2017
PROSECTOR	PATHOLOGIST	DATE COMPLETED

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Pathology Module - Final Pathology Report
NATIONAL ZOOLOGICAL PARK

PATH # N2017-0194

Death Date: 9/15/2017
Necropsy Date: 9/15/2017

MONOCIRRHUS POLYACANTHUS
Amazon leaffish
Name:

Gender: Unknown Sex
Age:

Accession No.: 500886
Birth:
Acquired: 01 Sep 2017

SEX: Unknown Sex AGE: ADULT WEIGHT: 3.6 gm STAY:

MANNER OF DEATH:Found Dead
TIME OF DEATH:
DEATH LOCATION:
SUBMITTOR:
OWNER/ANIMAL DEPT:DOA

INTERVAL:6-24 hours
XRAYED:False
DISPOSITION:ALL IN FORMALIN
PROSECTOR:Holder

HISTORY AND CLINCICAL OBSERVATIONS:

KEEPER OBSERVATIONS: On 9/15/2017 By TW

1 FTD at AM healthcheck

CLINICIAN OBSERVATIONS: On By

GROSS DESCRIPTION: On 9/15/2017 By KAH

Presented for necropsy is an 8.2 cm, 3.6 g, adult leaffish of undetermined sex. Postmortem condition is moderately autolyzed.

GROSS DIAGNOSIS: By

LABORATORY STUDIES:

TISSUE STATUS:

SHELVED:	False
TRIMMED:	True
FROZEN:	False
ULTRAFROZEN:	False

Tissues Ultrafrozen:

SPECIAL REQUESTS: On By

HISTOLOGY: On 10/2/2017 By KAH

1. LIVER, GI
2. HEAD KIDNEY, GILLS, EYE, BRAIN

MORPHOLOGIC DIAGNOSIS:

1) Whole body: Moderate to severe postmortem autolysis.

REMARKS: On 10/2/2017 By KAH

Autolysis in this case was severe and may have obscured relevant diagnostic lesions.

Holder	Holder	10/2/2017
PROSECTOR	PATHOLOGIST	DATE COMPLETED

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Pathology Module - Final Pathology Report
NATIONAL ZOOLOGICAL PARK

PATH # N2017-0198

Death Date: 9/26/2017
Necropsy Date: 9/26/2017

EURYCEA BISLINEATA (no subsp) Gender: Female
Two-lined salamander Age: 1Y 8M 25D
Name:

Accession No.: 307604
Birth: 01 Jan 2016
Acquired: 31 May 2016
Removed: 26 Sep 2017

SEX: Female AGE: 1Y 8M 25D WEIGHT: 1.7 gm STAY:

MANNER OF DEATH: Found Dead
TIME OF DEATH:
DEATH LOCATION: Salamander backup holding
SUBMITTOR: Evans
OWNER/ANIMAL DEPT: DOH

INTERVAL: 0-6 hours
XRAYED: False
DISPOSITION: ALL IN FORMALIN
PROSECTOR: Holder

HISTORY AND CLINCICAL OBSERVATIONS:

KEEPER OBSERVATIONS: On 9/26/2017 By ME

This salamander lives alone in a plastic container, kept on moist paper towels. The paper towels were changed yesterday. This animal was seen active yesterday and had a fresh fecal in its enclosure. Temperatures have been stable around 75 degrees F. Body condition looks good and normal. No obvious changes in behavior or its environment noted.

CLINICIAN OBSERVATIONS: On By

GROSS DESCRIPTION: On 9/26/2017 By KAH

Presented for necropsy is a 1.7 g adult female two-lined salamander in adequate body condition and fresh postmortem condition. The snout-vent length is 4.7 cm. The caudal abdomen is slightly distended by an intracoelomic, 7 mm diameter, solid, soft, red mass associated with the left ovary. The mass is pale on cut surface. The liver is slightly pale and mottled.

No other abnormalities are noted.

GROSS DIAGNOSIS: By KAH

Suspected tumor of urogenital origin.

LABORATORY STUDIES:

TISSUE STATUS:

SHELVED:	False
TRIMMED:	True
FROZEN:	False
ULTRAFROZEN:	True

Tissues Ultrafrozen: Skin, foot, liver, mass

SPECIAL REQUESTS: On By

HISTOLOGY: On 10/10/2017 By KAH

1. MASS, OVARIES, GI, LIVER
2. HEAD, BODY

MORPHOLOGIC DIAGNOSIS:

1) Kidney: Renal adenoma.

REMARKS: On 10/10/2017 By KAH

The tumor identified grossly appears to originate within renal tissue and is seen marginalizing normal renal tubules to the edge of the tumor while replacing the remaining kidney. It is highly cellular, fully encapsulated, well-vascularized, and has low mitotic activity with mild cellular atypia. Several differentials for this tumor were considered. The organization shows packeting and tubular formation, indicating a renal or neuroendocrine tumor. However, cell margins are fairly distinct and presence of remaining normal tubules indicates renal tumor is most likely. Among renal tumors, nephroblastomas and Lucke's tumor of frogs have been reported in amphibians. This animal did not have any recognizable blastemal or primitive glomerular architecture, making nephroblastoma unlikely. This tumor's architecture is quite distinct from Lucke's tubulo-papillary presentation, and no evidence of viral infection was identified. The level of differentiation and the fact that it was able to grow so large without extending beyond the capsule, developing necrosis, or exhibiting other features of malignancy is most consistent with a benign epithelial tumor.
Additional diagnostic options are being investigated. If further information becomes available, it will

be added to this report as an addendum.

Holder	Holder	10/10/2017
PROSECTOR	PATHOLOGIST	DATE COMPLETED

Pathology Module - Final Pathology Report
NATIONAL ZOOLOGICAL PARK

PATH # N2017-0199

Death Date: 9/28/2017
Necropsy Date: 9/28/2017

PARACHEIRODON AXELRODI
Cardinal tetra
Name:

Gender: Unknown Sex
Age:

Accession No.: 500808
Birth:
Acquired: 20 Oct 2014
01 Jul 2017

SEX: Unknown Sex AGE: ADULT WEIGHT: 0.5 gm STAY:
MANNER OF DEATH:Found Dead INTERVAL:0-6 hours
TIME OF DEATH: XRAYED:False
DEATH LOCATION:FSA6 DISPOSITION:ALL IN FORMALIN
SUBMITTOR:Lando McCall PROSECTOR:Holder
OWNER/ANIMAL DEPT:DOA

HISTORY AND CLINCICAL OBSERVATIONS:

KEEPER OBSERVATIONS: On 9/28/2017 By LM
Found deceased among plant material in tank. No external injuries observed. Carcass in good condition.

CLINICIAN OBSERVATIONS: On By

GROSS DESCRIPTION: On 9/28/2017 By KAH
Received for necropsy is a 0.5 g adult cardinal tetra of unknown sex. Carcass is in adequate body condition and good postmortem condition. Fork length is 3.7 cm. The ventral body wall is incised and internal organs examined, and the entire carcass is placed in formalin for histopathology.

GROSS DIAGNOSIS: By

LABORATORY STUDIES:

TISSUE STATUS:

SHELVED:	False
TRIMMED:	True
FROZEN:	False
ULTRAFROZEN:	False

Tissues Ultrafrozen:

SPECIAL REQUESTS: On By

HISTOLOGY: On 10/20/2017 By KAH
1. WHOLE FISH IN CROSS SECTIONS

MORPHOLOGIC DIAGNOSIS:
1) Multiple organs: Granulomas consistent with mycobacteriosis.

REMARKS: On 10/20/2017 By KAH
The cause of death in this animal is presumed to be mycobacteriosis due to the tank history and widespread granulomatosis.

Holder	Holder	10/20/2017
PROSECTOR	PATHOLOGIST	DATE COMPLETED

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Pathology Module - Final Pathology Report
NATIONAL ZOOLOGICAL PARK

PATH # W2017-0010

Death Date: 2/22/2017
Necropsy Date: 2/22/2017

SCIURUS CAROLINENSIS (no subsp) Gender: Female
Eastern grey squirrel Age:
Name: W2017-0010

Accession No.: ẏ02912
Birth:
Acquired:

SEX: Female AGE: ADULT WEIGHT: 590 gm STAY:

MANNER OF DEATH: Found Dead
TIME OF DEATH: 01:15P
DEATH LOCATION: Asia Trail YD4
SUBMITTOR: Tallie Wiles
OWNER/ANIMAL DEPT: OUT

INTERVAL: 0-6 hours
XRAYED: False
DISPOSITION: INCINERATE
PROSECTOR: MCP

HISTORY AND CLINCICAL OBSERVATIONS:

KEEPER OBSERVATIONS: On 2/22/2017 By TW

Squirrel found on top of the exhibit mesh.

CLINICIAN OBSERVATIONS: On By

GROSS DESCRIPTION: On 2/23/2017 By ANC

Received is an adult, female, 590 gram, Eastern grey squirrel for necropsy on 22 February 2017 after being found dead. The carcass is in fair postmortem condition and fair body condition with adequate musculature but minimal subcutaneous and intra-abdominal adipose tissue. There is a 4 mm in diameter, crusted, skin lesion on the left side of the muzzle. The liver is mottled yellow to red. The stomach and small intestines contain large amounts of digesta. The dorsal aspect of the lungs are diffusely red (postmortem, gravity dependent pooling). All other organs and tissues examined are grossly within normal limits.

GROSS DIAGNOSIS: By ANC

Skin, muzzle: Focal, ulcerative dermatitis (presumptive)

LABORATORY STUDIES:

TISSUE STATUS:

SHELVED:	False
TRIMMED:	True
FROZEN:	False
ULTRAFROZEN:	True

Tissues Ultrafrozen: Lung, liver, spleen, kidney

SPECIAL REQUESTS: On By

HISTOLOGY: On 3/28/2017 By ANC

1. LUNG: Alveoli are often flooded with proteinaceous fluid. Pulmonary vessels are surrounded by few lymphocytes.
2. HEART: Multifocally, few lymphocytes, plasma cells and histiocytes infiltrate the myocardial interstitium. Epicardial adipocytes are robust.
3. TONGUE; MUZZLE SKIN; SPLEEN; TRACHEA; ESOPHAGUS: The skin is focally overlain by a large crust of basophilic, homogeneous extracellular material with few embedded neutrophisl, bacterial colonies and foreign debris. The underlying skin is unremarkable.
4. KIDNEY; ADRENAL GLAND; URINARY BLADDER; UTERUS: Intrinsic arteries in the uterus are often thrombosed and recannalized (multiparous uterus). Few lymphocytes and neutrophils infiltrate the endometrial stroma.
5. LIVER; GALLBLADDER: Portal tracts are infiltrated by lymphocytes and histiocytes.
6. BRAIN: WNL.
7. BRAIN: WNL.
8. BRAIN: WNL.
9. STOMACH; PANCREAS: Superficially embedded within the duodenal mucosa is a ~75 um diameter nematode with granular basophilic internal structure. Scattered coccidial gamonts are present in small intestinal enterocytes and oocysts within the lumen.
10. SMALL INTESTINE; MESENTERIC LYMPH NODE: There are scattered coccidial organisms in the small intestine.
11. COLON; ILEOCECAL JUNCTION: WNL.

MORPHOLOGIC DIAGNOSIS:

1) Skin, muzzle: Mild, focal, exudative dermatitis
2) Skin, muzzle: Mild, focal, exudative dermatitis
3) Uterus: Mild, multifocal, chronic, lymphocytic and neutrophilc endometritis
4) Small intestine: Mild nematodiasis and coccidiosis
5) Heart: Minimal, multifocal, chronic, lymphocytic myocarditis

REMARKS: On 3/28/2017 By ANC

3/28/17: There were no significant histologic lesions to suggest a cause of death. Acute covert trauma is still considered possible. Facial dermatitis is limited to surface exudation of proteinaceous fluid with minimal inflammatory cell infiltrates in the skin. Intestinal parasitism and mild inflammation in the heart, liver and uterus are considered clinically insignificant.

MCP	Andrew Cartoceti	3/28/2017
PROSECTOR	PATHOLOGIST	DATE COMPLETED

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Pathology Module - Final Pathology Report
NATIONAL ZOOLOGICAL PARK

PATH # W2017-0014

Death Date: 3/13/2017
Necropsy Date: 3/13/2017

MUS MUSCULUS (no subsp)
House mouse
Name: W2017-0014

Gender: Unknown Sex
Age:

Accession No.: ÿ02916
Birth:
Acquired:

SEX: Unknown Sex AGE: UNKNOWN WEIGHT: 2.9 gm STAY:

MANNER OF DEATH: Found Dead
TIME OF DEATH: AM:
DEATH LOCATION: SMH33
SUBMITTOR: Kenton Kerns
OWNER/ANIMAL DEPT: OUT

INTERVAL: 0-6 hours
XRAYED: False
DISPOSITION: FROZEN
PROSECTOR: Cartoceti

HISTORY AND CLINCICAL OBSERVATIONS:

KEEPER OBSERVATIONS: On 3/13/2017 By KK

Feral dead mouse found dead in #33 in the AM. Partially chewed by GLTs (probably). Exhibit has GLTs 114167 and 115386 and sloth 110846. Submitted due to rodenticide in neighboring exhibits.

CLINICIAN OBSERVATIONS: On By

GROSS DESCRIPTION: On 3/13/2017 By ANC

Received is a 2.9 gram, unknown sex, juvenile to adult House mouse for necropsy on 13 March 2017 after being found dead in Small Mammal House enclosure #33. The carcass is in poor postmortem condition. This skin is dried and difficult to remove. The internal viscera are dry, friable, unidentifiable, diffusely brown and multifocally overgrown with fluffy white mold. Body condition cannot be adequately assessed. The skin of the dorso-rostral head as well as the calvarium, dorsal nasal bones and brain are absent.

GROSS DIAGNOSIS: By ANC

Advanced autolysis
Postmortem scavenging/possible predation

LABORATORY STUDIES:

TISSUE STATUS:

No fixed tissues taken.

Tissues Ultrafrozen:

SPECIAL REQUESTS: On By

HISTOLOGY: On By

MORPHOLOGIC DIAGNOSIS:

REMARKS: On 3/13/2017 By ANC

3/13/17: Based on the level of postmortem autolysis, this mouse appears to have died several days prior to being found. The brain and portions of the skull have been consumed; however, due to the advanced level of autolysis, it cannot be determined if this represents postmortem scavenging or antemortem predation. Additional diagnostics, including histology, will not be performed. This will serve as a final report.

Cartoceti	Andrew Cartoceti	3/13/2017
PROSECTOR	PATHOLOGIST	DATE COMPLETED

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Pathology Module - Final Pathology Report
NATIONAL ZOOLOGICAL PARK

PATH # W2017-0015

Death Date: 3/15/2017
Necropsy Date: 3/15/2017

PROCYON LOTOR (no subsp) Gender: Female Accession No.: ÿ02917
Raccoon Age: Birth:
Name: W17-0015 (name is incorrect) Acquired:

SEX: Female AGE: JUVENILE WEIGHT: 3.265 kg STAY:
MANNER OF DEATH: Euthanasia INTERVAL: 0-6 hours
TIME OF DEATH: XRAYED: False
DEATH LOCATION: Necropsy DISPOSITION: INCINERATE
SUBMITTOR: Tony Barthel PROSECTOR: Andrew Cartoceti
OWNER/ANIMAL DEPT: OUT

HISTORY AND CLINCICAL OBSERVATIONS:

KEEPER OBSERVATIONS: On 3/15/2017 By TB

This animal was observed walking down the public path near the CCS area. It would approach closely to people. It did run when we tried to catch it but quickly slowed down and continued foraging/walking around. It traveled through the zebra yard and through the gazelle area in the back CCS holding before being caught. It did not come in contact with any collection animals that we observed.

CLINICIAN OBSERVATIONS: On By

GROSS DESCRIPTION: On 3/16/2017 By ANC

Received is a 3.265 kilogram, juvenile, female, raccoon for necropsy on 15 March 17 after being euthanized for closely approaching humans. The carcass is in excellent postmortem condition and good body condition with adequate subcutaneous and intra-abdominal adipose stores. There is abundant blood staining of the fur of the ventral head and neck and forelimbs. Two small (~0.5 cm) lacerations are present in the nasal planum and upper lip. There is a small (~0.5 cm) laceration in the right palm with minimal associated hemorrhage. A ~0.5 x 0.5 cm laceration in the intermandibular skin has a small amount of associated subcutaneous hemorrhage. The subcutis over the left hip has suffusive hemorrhage (presumed sedation artifact). The distal trachea contains frank hemorrhage (presumed euthanasia artifact). The lungs are pale pink with large patchy dark red discoloration and there is abundant frank hemorrhage into the left pleural cavity (presumed euthanasia artifact). The right cranial lobe is firmly adhered to the ribcage along ribs 5 to 7. The liver lobes, especially the caudate lobe, are enlarged and have rounded and scalloped margins. The liver is slightly gritty when incised and palpates more firm than normal. The lymph nodes are generally enlarged and prominent. The spleen is enlarged and has prominent lymphoid follicles. The brain, kidneys, urinary bladder, gall bladder, spleen, gastrointestinal tract and reproductive tract are grossly unremarkable.

GROSS DIAGNOSIS: By ANC

Multiple acute lacerations, nose, muzzle, right forefoot
Parietal to visceral pleural adhesion, right cranial lung
Hepatopathy (presumptive)
Pulmonary, tracheal and pleural hemorrhage (presumed euthanasia artifact)
Good body condition

LABORATORY STUDIES:
OTHER: Rabies FA - Positive

TISSUE STATUS:

SHELVED:	False
TRIMMED:	True
FROZEN:	False
ULTRAFROZEN:	True

Tissues Ultrafrozen: Liver, Kidney

SPECIAL REQUESTS: On By

HISTOLOGY: On 4/12/2017 By ANC

1. LUNG: Many alveoli are flooded with erythrocytes and/or proteinaceous fluid (euthanasia artifact).

2. LIVER; GALLBLADDER; SPLEEN: There are scattered mast cells in the splenic red pulp. Few lymphocytes infiltrate rare portal tracts.

3. KIDNEY; ADRENAL GLAND: Few scattered lymphocytes, eosinophils and plasma cells infiltrated the

adrenal medulla, bilaterally.

4. THYROID GLAND; MESENTERIC LYMPH NODE; PITUITARY GLAND; TRIGEMINAL GANGLIA: In the lymph node, there are many follicles with germinal centers. There are scattered eosinophils in the capsule, cortex and sinuses. In the pars nervosa of the pituitary gland, lymphocytes and plasma cells cuff some vessels.

5. HEART: WNL.

6. TRACHEA; ESOPHAGUS; URINARY BLADDER; STOMACH: Multifocally, few eosinophils infiltrate the esophageal and gastric lamina propria.

7. DUODENUM; PANCREAS; STOMACH: The lamina propria of the small intestine is diffusely infiltrated by eosinophils.

8. SMALL INTESTINE; LARGE INTESTINE; CECAL LYMPH NODE: The small and large intestinal lamina propria is diffusely infiltrated by eosinophils. The lymph node is as described previously.

9. BRAIN, CEREBRUM; BRAINSTEM: Scattered neuron cell bodies in the grey matter of the cerebrum and brainstem have intracytoplasmic, eosinophilic inclusions (Negri bodies). Focally in one brainstem nucleus, there are increased numbers of glial cells and activated microglia.

10. BRAIN, CEREBRUM, THALAMUS: As previously described.

11. BRAIN, CEREBELLUM, BRAINSTEM: Purkinje cells and neurons in brainstem nuclei have subtle intracytoplasmic eosinophilic inclusions.

12. BRAIN, CEREBRUM, MIDBRAIN: There are intracytoplasmic inclusions as previously described in laminar cortical neuron and hippocampal neurons.

MORPHOLOGIC DIAGNOSIS:

1) Brain: Multifocal neuronal intracytoplasmic inclusions bodies with focal gliosis
2) Stomach, small and large intestine: Mild to moderate, diffuse, eosinophilic gastroenterocolitis
3) Esophagus: Mild, multifocal, eosinophilic esophagitis
4) Adrenal gland: Mild, multifocal, chronic, lymphoplasmacytic and eosinophilic adrenalitis

REMARKS: On 4/12/2017 By ANC

4/13/17: Histology revealed intraneuronal inclusion bodies consistent with Rabies virus infection, which was confirmed on fluorescent antibody staining of the brain. Eosinophilic inflammation throughout the digestive tract is likely due to endoparasitism.

Andrew Cartoceti	Andrew Cartoceti	4/12/2017
PROSECTOR	PATHOLOGIST	DATE COMPLETED

Printed on: 4/12/2017 4:27:21 PM CARES-MED v2.119

Pathology Module - Final Pathology Report
NATIONAL ZOOLOGICAL PARK

PATH # W2017-0016

Death Date: 3/16/2017
Necropsy Date: 3/16/2017

TURDUS MIGRATORIUS (no subsp) Gender: Female Accession No.: ÿ02918
American robin Age: Birth:
Name: W17-0016 Acquired:

SEX: Female AGE: ADULT WEIGHT: 85.1 gm STAY:

MANNER OF DEATH: Found Dead
TIME OF DEATH: 07:30A
DEATH LOCATION: GP visitor walkwat
SUBMITTOR: M. Babitz
OWNER/ANIMAL DEPT: OUT

INTERVAL: 0-6 hours
XRAYED: False
DISPOSITION: INCINERATE
PROSECTOR: Andrew Cartoceti

HISTORY AND CLINCICAL OBSERVATIONS:

KEEPER OBSERVATIONS: On 3/16/2017 By MB

Found dead on ground outside exhibit glass - possible bird strike.

CLINICIAN OBSERVATIONS: On By

GROSS DESCRIPTION: On 3/16/2017 By ANC

Received is a 85.1 gram, female, adult, American robin for necropsy on 16 March 2017 after being found dead. The carcass is in good postmortem condition and good body condition with well-fleshed muscles and adequate adipose stores. The right and left lobes of the liver are fractured and there is abundant acute hemorrhage into the coelomic cavity and abdominal airsacs. The lungs, gastrointestinal tract, spleen, kidneys, and ovary are grossly unremarkable.

GROSS DIAGNOSIS: By ANC

See morphologic diagnoses

LABORATORY STUDIES:

TISSUE STATUS:

SHELVED:	True
TRIMMED:	False
FROZEN:	False
ULTRAFROZEN:	False

Tissues Ultrafrozen:

SPECIAL REQUESTS: On By

HISTOLOGY: On By

MORPHOLOGIC DIAGNOSIS:

1) Window strike
2) Acute liver rupture with abundant hemorrhage

REMARKS: On 3/16/2017 By ANC

3/16/17: The gross findings are strongly suggestive of death due to exsanguination as a result of window-strike. Visceral organs are saved in formalin but histology will not be performed. This will serve as a final report.

Andrew Cartoceti	Andrew Cartoceti	3/16/2017
PROSECTOR	PATHOLOGIST	DATE COMPLETED

Printed on: 3/16/2017 4:17:25 PM CARES-MED v2.119

Pathology Module - Final Pathology Report
NATIONAL ZOOLOGICAL PARK

PATH # W2017-0024

Death Date: 4/19/2017
Necropsy Date: 4/19/2017

PROCYON LOTOR (no subsp) Gender: Female Accession No.: ÿ02920
Raccoon Age: Birth:
Name: W17-0024 Acquired:

SEX: Female AGE: ADULT WEIGHT: 3.433 kg STAY:

MANNER OF DEATH: Euthanasia
TIME OF DEATH: 11:00
DEATH LOCATION: WHS
SUBMITTOR: KLH
OWNER/ANIMAL DEPT: OUT

INTERVAL: 0-6 hours
XRAYED: False
DISPOSITION: INCINERATE
PROSECTOR: Andrew Cartoceti

HISTORY AND CLINCICAL OBSERVATIONS:

KEEPER OBSERVATIONS: On By

CLINICIAN OBSERVATIONS: On 4/19/2017 By KLH

Animal found near Visitors center this morning with severe tail degloving, and depressed attitude. Animal was crated, at which point he became more aggressive. pieces of raccoon tail were later found in the cheetah yard with cheetah 114777 having had exposure to the yard overnight.
Raccoon was anesthetized with telazol, ketamine and xylazine. Euthanized with intracardiac euthasol.

GROSS DESCRIPTION: On 4/19/2017 By ANC

Received is a 3.433 kilogram, adult, female raccoon for necropsy on 19 April 2017 after being euthanized for depression and a degloving tail wound. The carcass is in good postmortem condition and good body condition with well-fleshed muscles and adequate amounts of subcutaneous and intra-abdominal adipose. The distal part of the tail is amputated and the remaining tail lacks skin. The exposed subcutis and muscle is reddened, partially dried and covered with dirt and debris. There is a puncture wound in the skin of the dorsal aspect of the right distal tibia. The underlying subcutis is edematous and contains small amounts of thick white exudate (pus). The skin of the rostral mandible/chin is depigmented, sparsely haired and abraded. Multifocally, there are small abrasions on the dorsal surface of the toes. Fleas are present in the fur. The stomach contains granular grey brown ingesta. The small intestine contains scant pasty tan ingesta and there is a small focus of reddening in the wall of the distal jejunum. The colon contains formed feces. The eyes, brain, trachea, esophagus, lungs, heart, liver, gallbladder, spleen, kidneys, adrenal glands, thyroid glands, lymph nodes, ovaries, reproductive tract and urinary bladder are grossly unremarkable.

GROSS DIAGNOSIS: By ANC

Acute degloving tail wound
Subacute puncture wound with suppurative cellulitis, right tibia
Subacute to chronic skin abrasions, chin and feet

LABORATORY STUDIES:
OTHER: Brain - Rabies FA

TISSUE STATUS:

SHELVED:	True
TRIMMED:	False
FROZEN:	False
ULTRAFROZEN:	True

Tissues Ultrafrozen: Liver (2), kidney, lung

SPECIAL REQUESTS: On By

HISTOLOGY: On By

MORPHOLOGIC DIAGNOSIS:

REMARKS: On 4/26/2017 By ANC

4/26/17: Rabies virus infection was confirmed as the cause of this animal's depressed mentation via direct fluorescent antibody testing of the brain. Histology will not be performed. This concludes all diagnostic testing.

Andrew Cartoceti	Andrew Cartoceti	4/26/2017
PROSECTOR	PATHOLOGIST	DATE COMPLETED

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Pathology Module - Final Pathology Report
NATIONAL ZOOLOGICAL PARK

PATH # W2017-0026

Death Date: 5/4/2017
Necropsy Date: 5/4/2017

ODOCOILEUS VIRGINIANUS (no subsp) Gender: Female
White-tailed deer Age:
Name: Hospital accession x2588

Accession No.: y02923
Birth:
Acquired:

SEX: Female AGE: ADULT WEIGHT: 0 gm STAY:

MANNER OF DEATH: Euthanasia
TIME OF DEATH: 11:00
DEATH LOCATION: WHS
SUBMITTOR: KLH
OWNER/ANIMAL DEPT: OUT

INTERVAL: 0-6 hours
XRAYED: False
DISPOSITION: INCINERATE
PROSECTOR: Andrew Cartoceti

HISTORY AND CLINCICAL OBSERVATIONS:

KEEPER OBSERVATIONS: On By

CLINICIAN OBSERVATIONS: On 5/4/2017 By KLH

Wild doe found at bottom of upper bear "moat", unable to move back legs. Darted with ketamine and xylazine, and euthanized with euthasol IV. palpable spinal fracture. Necropsy not requested

GROSS DESCRIPTION: On 5/5/2017 By ANC

An adult female white-tailed deer is received for incineration on 4 May 2017 after being found in the "moat" at the upper bear exhibit. On external palpation there is severe laxity and crepitus in the lumbar vertebrae, consistent with a complete vertebral fracture. A full necropsy is not performed and tissues are not collected.

GROSS DIAGNOSIS: By ANC

Vertebrae, lumbar: Severe, acute, complete, transverse fracture

LABORATORY STUDIES:

TISSUE STATUS:

No fixed tissues taken.

Tissues Ultrafrozen:

SPECIAL REQUESTS: On By

HISTOLOGY: On By

MORPHOLOGIC DIAGNOSIS:

REMARKS: On 5/5/2017 By ANC

5/5/17: External palpation revealed a complete lumbar vertebral fracture consistent with the clinical finding of hindlimb paralysis. A complete necropsy is not performed.

Andrew Cartoceti	Andrew Cartoceti	5/5/2017
PROSECTOR	PATHOLOGIST	DATE COMPLETED

Printed on: 5/5/2017 9:05:58 AM CARES-MED v2.119

Pathology Module - Final Pathology Report
NATIONAL ZOOLOGICAL PARK

PATH # W2017-0028

Death Date: 5/19/2017
Necropsy Date: 5/18/2017

GEOTHLYPIS FORMOSA
Kentucky warbler
Name: W2017-0028

Gender: Female
Age:

Accession No.: ÿ02925
Birth:
Acquired:

SEX: Female AGE: ADULT WEIGHT: 15.2 gm STAY:

MANNER OF DEATH: Found Dead
TIME OF DEATH: 07:30
DEATH LOCATION: Runway (giant pandas)
SUBMITTOR: N MacCorkle
OWNER/ANIMAL DEPT: OUT

INTERVAL: 0-6 hours
XRAYED: False
DISPOSITION: FORMALIN
PROSECTOR: Andrew Cartoceti

HISTORY AND CLINCICAL OBSERVATIONS:

KEEPER OBSERVATIONS: On 5/19/2017 By NM

Found dead in runway this morning.

CLINICIAN OBSERVATIONS: On By

GROSS DESCRIPTION: On 5/19/2017 By ANC

A 15.2 gram, female, adult Kentucky warbler is necropsied on 18 May 2017 after being found dead. The carcass is in fair to good postmortem condition (moderate autolysis in intestines) and good body condition with well-fleshed pectoral muscles and adequate subcutaneous and intra-coelomic adipose stores. There is abundant hemorrhage in the right pectoral muscles, adjacent to the right ribs and caudal to the right shoulder joint. The coelomic cavity contains moderate amounts of hemorrhage, around the lungs, liver, spleen, and intestines. The brain, eyes, oral cavity, esophagus, trachea, lungs, heart, kidneys and ovary are grossly unremarkable.

GROSS DIAGNOSIS: By ANC

Pectoral muscle: Moderate, regionally extensive, acute hemorrhage
Coelomic cavity: Moderate, multifocal, acute hemorrhage

LABORATORY STUDIES:

CYTOLOGY: Lung impressions (2)

TISSUE STATUS:

SHELVED:	True
TRIMMED:	False
FROZEN:	False
ULTRAFROZEN:	False

Tissues Ultrafrozen:

SPECIAL REQUESTS: On By

HISTOLOGY: On By

MORPHOLOGIC DIAGNOSIS:

REMARKS: On 5/19/2017 By ANC

5/18/17: The gross findings are consistent with acute trauma, likely due to window strike. Tissues are saved in formalin but will not be trimmed. This will serve as a final report.

Andrew Cartoceti	Andrew Cartoceti	5/19/2017
PROSECTOR	PATHOLOGIST	DATE COMPLETED

Printed on: 5/19/2017 8:36:19 AM CARES-MED v2.119

Pathology Module - Final Pathology Report
NATIONAL ZOOLOGICAL PARK

PATH # W2017-0029

Death Date: 5/18/2017
Necropsy Date: 5/18/2017

PROCYON LOTOR (no subsp) Gender: Female Accession No.: ÿ02924
Raccoon Age: Birth:
Name: W2017-0029 Acquired:

SEX: Female AGE: ADULT WEIGHT: 5.1 kg STAY:
MANNER OF DEATH: Euthanasia INTERVAL: 0-6 hours
TIME OF DEATH: 09:00A XRAYED: False
DEATH LOCATION: WHS DISPOSITION: INCINERATE
SUBMITTOR: JCS/DLN PROSECTOR: Kali Holder
OWNER/ANIMAL DEPT: OUT

HISTORY AND CLINCICAL OBSERVATIONS:

KEEPER OBSERVATIONS: On By

CLINICIAN OBSERVATIONS: On 5/18/2017 By JCS

Suspected hit by car adult raccoon found at around CCS and visitor center. No known human or animal exposure.

GROSS DESCRIPTION: On 5/19/2017 By KAH

A 5.1 kg, adult, intact female raccoon (Procyon lotor, wild) is necropsied 18 May 2017 following euthanasia. The carcass is in excellent postmortem condition and good body condition with well-fleshed pectoral muscles and adequate subcutaneous and intra-abdominal adipose stores. The right rear paw has a healing, scabbed dermal wound on the dorsal metatarsus. The right forelimb has multiple abrasions and lacerations with a ragged, 3 cm laceration over the dorsal and medial carpus. The distal radius is protruding through the lacerated skin and is completely luxated from the ulna and carpal bones. The wound contains foreign debris. There is subcutaneous and intramuscular hemorrhage along the distal antebrachium and at the glenohumeral joint. The right first maxillary incisor is detached, and the teeth have abundant dental tartar. There is a small amount of blood-tinged material in the proximal esophagus. The right lung is dark red in all lobes with a rim of normal pink color at the periphery. All lung lobes have superficial 1-3 mm firm to gritty plaques on pleural surface. All lung sections float in formalin. The surface of the liver has numerous 1-3 mm diameter white thickened capsular regions; no abnormality is visible in the underlying parenchyma. The spleen and several liver lobes are moderately rounded. The root of the mesentery has several dilated tubular structures (presumed lymphatics) filled with clear yellow-tinged fluid. The renal cortex of the right kidney contains several cysts 2-5 mm in diameter and filled with clear fluid.

The eyes, brain, trachea, thyroid glands, heart, adrenal glands, mesenteric lymph nodes, ovaries, uterus, vagina, skeletal muscle and gastrointestinal tract are grossly unremarkable.

GROSS DIAGNOSIS: By KAH

Right forelimb: Antebrachial-carpal lacerations, distal radial luxation with bone protrusion, and multifocal antebrachial and humeral hemorrhage.
Lung: Subtotal pulmonary contusion, right lung. Multifocal pleural mineralization, bilateral.
Right kidney: Multifocal renal cortical cysts.
Teeth: Complete avulsion, right first maxillary incisor.
Mesentary: Lymphangiectasia, focal, moderate.
Liver: Multifocal capsular fibrosis, mild.
Right hindlimb: Dermal trauma.

LABORATORY STUDIES:
OTHER: Brain for Rabies FA to DCDOH

TISSUE STATUS:

SHELVED:	True
TRIMMED:	False
FROZEN:	False
ULTRAFROZEN:	False

Tissues Ultrafrozen:

SPECIAL REQUESTS: On By

HISTOLOGY: On 6/22/2017 By ANC

1. LUNG

2. KIDNEY
3. LIVER, SPLEEN
4. HEART; MESENTERIC LYMPH NODE; ADRENALS; THYROID
5. ESOPHAGUS; STOMACH; SMALL INTESTINE; PANCREAS; LARGE INTESTINE
6. TRACHEA; ESOPHAGUS; THYROID; LARGE INTESTINE; URINARY BLADDER
7. BRAIN, CEREBRUM
8. BRAIN, CEREBRUM, THALAMUS, HIPPOCAMPUS
9. BRAIN, CEREBELLUM, BRAINSTEM
10. BRAIN, MIDBRAIN, BRAINSTEM

MORPHOLOGIC DIAGNOSIS:

1) Lymph node, mesenteric: Moderate to severe, diffuse, chronic, eosinophilic and granulomatous lymphadenitis and steatitis with fibrosis
2) Kidneys: Moderate, multifocal, chronic, interstitial nephritis with interstitial fibrosis and tubular mineralization and casts
3) Lung: Mild to moderate, multifocal, chronic, granulomatous and eosinophilic pneumonia with mineralization, atelectasis and alveolar edema
4) Digestive tract: Mild, diffuse, eosinophilic gastroesophagitis and enterocolitis
5) Urinary bladder: Mild, diffuse, chronic, lymphocytic cystitis
6) Brain: Mild, multifocal, chronic, lymphoplasmacytic perivascular cuffing
7) Brain: Minimal, multifocal, chronic, plasmacytic choroiditis
8) Heart: Minimal, focal, chronic, lymphocytic myocarditis
9) Adrenal glands: Bilateral, nodular, cortical hyperplasia

REMARKS: On 6/22/2017 By ANC

6/22/17: Based on the absence of other significant disease, trauma is presumed to the most important cause of this raccoon's impaired behavior. Rabies testing of the brain was negative via fluorescent antibody. Digestive tract inflammation as well as pneumonia and lymphadenitis are consistent with enteric endoparasitism and helminth worm migration tracts, respectively. Mild lymphoplasmacytic infiltrates in the brain are suggestive of possible prior viral infection; however, there were no cellular inclusion bodies or necrosis to suggest Canine Distemper or Rabies infection.

Kali Holder	Andrew Cartoceti	6/22/2017
PROSECTOR	PATHOLOGIST	DATE COMPLETED

Printed on: 6/22/2017 1:30:48 PM CARES-MED v2.119

Pathology Module - Gross Pathology Report
NATIONAL ZOOLOGICAL PARK

PATH # W2017-0034

Death Date: 5/23/2017
Necropsy Date: 5/23/2017

MOLOTHRUS (unk sp)
Cowbird
Name: W2017-0034

Gender: Unknown Sex

Age:

Accession No.: y02929

Birth:

Acquired:

SEX: Unknown Sex AGE: WEIGHT: 6.8 gm STAY:

MANNER OF DEATH:Found Dead
TIME OF DEATH:07:45
DEATH LOCATION:LI
SUBMITTOR:MAS
OWNER/ANIMAL DEPT:OUT

INTERVAL:6-24 hours
XRAYED:False
DISPOSITION:INCINERATE
PROSECTOR:Holder

HISTORY AND CLINCICAL OBSERVATIONS:

KEEPER OBSERVATIONS: On 5/23/2017 By MAS

[None; found dead, Lemur Island]

CLINICIAN OBSERVATIONS: On By

GROSS DESCRIPTION: On 5/23/2017 By KAH

A wild, cowbird is necropsied on 23 May 2017 after being found dead in the lemur island enclosure. The carcass is missing the head but in adequate postmortem condition with well-fleshed musculature and adequate subcutaneous and intra-coelomic adipose stores. The epicardial surface has mild paintbrush hemorrhage. The liver is pale red-brown. The brain, eyes, lungs, trachea, gastrointestinal tract, spleen and kidneys are grossly unremarkable.

GROSS DIAGNOSIS: By KAH

Epicardial hemorrhage, mild. Body as a whole: Good body condition

GROSS COMMENTS: On 5/23/2017 By KAH

Tissues saved in formalin for histopathology.

LABORATORY STUDIES:

TISSUE STATUS:

SHELVED:	False
TRIMMED:	True
FROZEN:	False
ULTRAFROZEN:	True
Tissues Ultrafrozen:	spleen, lung, kidney, liver, heart, gi

SPECIAL REQUESTS: On By

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Pathology Module - Final Pathology Report
NATIONAL ZOOLOGICAL PARK

PATH # W2017-0039

Death Date: 5/28/2017
Necropsy Date: 5/28/2017

NYCTICORAX NYCTICORAX (no subsp) Gender: Unknown Sex
Black-crowned night heron Age:
Name: W2017-0039

Accession No.: y02934
Birth:
Acquired:

SEX: Unknown Sex AGE: JUVENILE WEIGHT: 319 gm STAY:

MANNER OF DEATH:Found Dead
TIME OF DEATH:
DEATH LOCATION:
SUBMITTOR:
OWNER/ANIMAL DEPT:OUT

INTERVAL:6-24 hours
XRAYED:False
DISPOSITION:INCINERATE
PROSECTOR:Holder

HISTORY AND CLINCICAL OBSERVATIONS:

KEEPER OBSERVATIONS: On 5/28/2017 By JT

Found dead under Black-crowned Night Heron nesting site

CLINICIAN OBSERVATIONS: On By

GROSS DESCRIPTION: On 5/28/2017 By KAH

A wild, nestling, black-crowned night heron of undetermined sex is necropsied on 28 May 2017 after being found dead in BH30 area. The carcass is in adequate postmortem condition and emaciated body condition with a prominent keel, poor thigh muscling, and absent intra-coelomic adipose stores. Several air sacs contain scant yellow material consistent with fibrin. The lungs are pale. The ventriculus and intestines are empty except for a dark brown fluid. There is an apparent stricture of the pylorus: no detectable opening is found between the ventriculus and duodenum. The brain, eyes, heart, trachea, thyroid glands, liver, spleen, kidneys and rest of the gastrointestinal tract are grossly unremarkable.

GROSS DIAGNOSIS: By KAH

Pylorus: Possible stricture
Body as a whole: Poor body condition with atrophy of fat

LABORATORY STUDIES:

TISSUE STATUS:

SHELVED:	False
TRIMMED:	True
FROZEN:	False
ULTRAFROZEN:	True

Tissues Ultrafrozen: Liver, lung, GI

SPECIAL REQUESTS: On By

HISTOLOGY: On 6/27/2017 By KAH

1. THYROID KIDNEY ADRENAL TESTIS
2. SPLEEN VENTRICULUS PROVENTRICULUS DUODENUM
3. SMALL INTESTINE LIVER PANCREAS
4. LUNG BRAIN
5. HEART SKELETAL MUSCLE BRAIN

MORPHOLOGIC DIAGNOSIS:

1) Small intestine: Enteritis, hemorrhagic, moderate.
2) Body as a whole: Very poor body condition.

REMARKS: On 6/27/2017 By KAH

The poor body condition of this animal may have been due to reduced caloric intake, but the enteritis (slide 3) likely contributed to the fatal outcome. Infectious causes for the enteritis are most likely, and bacterial enteritis is the top differential. The potential stricture of the pylorus could not be confirmed histologically and likely was simply physiologically constricted.

Holder	CARTOCETI	6/27/2017
PROSECTOR	PATHOLOGIST	DATE COMPLETED

Printed on: 6/27/2017 9:38:03 AM CARES-MED v2.119

Pathology Module - Final Pathology Report
NATIONAL ZOOLOGICAL PARK

PATH # W2017-0041

Death Date: 5/29/2017
Necropsy Date: 5/30/2017

NYCTICORAX NYCTICORAX (no subsp) Gender: Male
Black-crowned night heron Age:
Name: W2017-0041

Accession No.: y02930
Birth:
Acquired:

SEX: Male AGE: NEONATE WEIGHT: 200.4 gm STAY:

MANNER OF DEATH: Found Dead
TIME OF DEATH:
DEATH LOCATION: BH31
SUBMITTOR: Shelby Burns
OWNER/ANIMAL DEPT: OUT

INTERVAL: 24-48 Hours
XRAYED: False
DISPOSITION: INCINERATE
PROSECTOR: Andrew Cartoceti

HISTORY AND CLINCICAL OBSERVATIONS:

KEEPER OBSERVATIONS: On 5/29/2017 By SB

Heron chick fell from nest, found dead AM

CLINICIAN OBSERVATIONS: On By

GROSS DESCRIPTION: On 5/30/2017 By ANC

A wild, nestling, male, black-crowned night heron is necropsied on 30 May 2017 after being found dead in enclosure BH31. The carcass is in poor postmortem condition with malodorous, green discolored viscera and fly larvae infesting the subcutis of the right flank. The carcass is in poor body condition with moderately well-fleshed musculature but no subcutaneous and intra-coelomic adipose stores. The subcutis is dry, tacky and difficult to separated from the skin and musculature. The eyes, heart, lungs, trachea, thyroid glands, liver, spleen, testes, kidneys and gastrointestinal tract are grossly unremarkable.

GROSS DIAGNOSIS: By ANC

Body as a whole: Poor body condition with scant adipose

LABORATORY STUDIES:

TISSUE STATUS:

No fixed tissues taken.

Tissues Ultrafrozen:

SPECIAL REQUESTS: On By

HISTOLOGY: On By

MORPHOLOGIC DIAGNOSIS:

REMARKS: On 5/30/2017 By ANC

5/30/17: Hypothermia and hypoglycemia due to separation from the nest are presumed to be the cause of death in this nestling, as there were no other significant gross findings. Tissues are not taken for histology and this will serve as a final report.

Andrew Cartoceti	Andrew Cartoceti	5/30/2017
PROSECTOR	PATHOLOGIST	DATE COMPLETED

Printed on: 5/31/2017 10:48:26 AM CARES-MED v2.119

Pathology Module - Final Pathology Report
NATIONAL ZOOLOGICAL PARK

PATH # W2017-0042

Death Date: 5/30/2017
Necropsy Date: 5/30/2017

NYCTICORAX NYCTICORAX (no subsp) Gender: Male
Black-crowned night heron Age:
Name: W2017-0042

Accession No.: ÿ02931
Birth:
Acquired:

SEX: Male AGE: NEONATE WEIGHT: 0 gm STAY:

MANNER OF DEATH: Found Dead
TIME OF DEATH:
DEATH LOCATION: BH33
SUBMITTOR: Ric Pinto
OWNER/ANIMAL DEPT: OUT

INTERVAL: 6-24 hours
XRAYED: False
DISPOSITION: INCINERATE
PROSECTOR: Andrew Cartoceti

HISTORY AND CLINCICAL OBSERVATIONS:

KEEPER OBSERVATIONS: On 5/30/2017 By RP

Found dead in exhibit, it seemed they probably died during the night.

CLINICIAN OBSERVATIONS: On By

GROSS DESCRIPTION: On 5/30/2017 By ANC

Two wild, nestling,black-crowned night heron are necropsied on 30 May 2017 after being found dead in enclosure BH33. The first carcass is designated A and is a 257.1 gram male in fair postmortem condition and fair body condition with moderately well-fleshed musculature but no subcutaneous and intra-coelomic adipose stores. There is abundant subcutaneous hemorrhage along the neck and abdominal body wall and a frank blood clot in the coleomic cavity. The ventriculus contains grey granular soft ingesta with red flecks. The eyes, heart, lungs, trachea, thyroid glands, liver, spleen, testes, kidneys and gastrointestinal tract are grossly unremarkable.

The second bird is designated B and is a 391.6 gram male in fair postmortem condition and fair body condition with moderately well-fleshed musculature but scant adipose stores. There is scant, suffusive, subcutaneous hemorrhage along the lateral aspects of the skull and the caudal neck. The ventriculus contain scant, pasty to watery, red brown material (presumed partially digested blood). The eyes, heart, lungs, trachea, thyroid glands, liver, spleen, testes, kidneys and gastrointestinal tract are grossly unremarkable.

GROSS DIAGNOSIS: By ANC

Bird A, subcutis, coelomic cavity: Moderate to severe, acute hemorrhage with hemocoelom
Bird A, body as a whole: Fair body condition with scant adipose
Bird B, subcutis, head and neck: Mild, acute, multifocal subcutaneous hemorrhage
Bird B, body as a whole: Fair body condition with scant adipose

LABORATORY STUDIES:

TISSUE STATUS:

No fixed tissues taken.

Tissues Ultrafrozen:

SPECIAL REQUESTS: On By

HISTOLOGY: On By

MORPHOLOGIC DIAGNOSIS:

REMARKS: On 5/30/2017 By ANC

5/30/17: The gross findings in both birds are consistent with death due to acute trauma, likely sustained when these animals fell from the nest.. Tissues are not taken for histology and this will serve as a final report.

Andrew Cartoceti	Andrew Cartoceti	5/30/2017
PROSECTOR	PATHOLOGIST	DATE COMPLETED

Printed on: 5/31/2017 10:49:20 AM CARES-MED v2.119

Pathology Module - Final Pathology Report
NATIONAL ZOOLOGICAL PARK

PATH # W2017-0043

Death Date: 5/30/2017
Necropsy Date: 5/30/2017

TURDUS MIGRATORIUS (no subsp) Gender: Male Accession No.: y02932
American robin Age: Birth:
Name: W2017-0043 Acquired:

SEX: Male AGE: WEIGHT: 76.8 gm STAY:
MANNER OF DEATH: Found Dead INTERVAL: 6-24 hours
TIME OF DEATH: 08:00a XRAYED: False
DEATH LOCATION: Lemur Island DISPOSITION: INCINERATE
SUBMITTOR: MAS PROSECTOR: Andrew Cartoceti
OWNER/ANIMAL DEPT: OUT

HISTORY AND CLINCICAL OBSERVATIONS:

KEEPER OBSERVATIONS: On 5/30/2017 By MAS
Hit window panel at LI.

CLINICIAN OBSERVATIONS: On By

GROSS DESCRIPTION: On 5/30/2017 By ANC
A 76.8 gram, adult/juvenile, male, American robin is necropsied on 30 May 2017 after striking a window panel at Lemur Island. The carcass is in good postmortem condition and good body condition with well-fleshed musculature and adequate subcutaneous and intra-coelomic adipose stores. The liver is fractured and there is a moderate amount of frank, clotted blood adhered to the dorsal aspect of the liver and the adjacent gonads and kidneys. The eyes, heart, lungs, trachea, thyroid glands, liver, spleen, testes, kidneys and gastrointestinal tract are grossly unremarkable.

GROSS DIAGNOSIS: By ANC
Liver: Acute liver fracture with hemocoelom
Body as a whole: Good body condition

LABORATORY STUDIES:

TISSUE STATUS:
No fixed tissues taken.

Tissues Ultrafrozen:

SPECIAL REQUESTS: On By

HISTOLOGY: On By

MORPHOLOGIC DIAGNOSIS:

REMARKS: On 5/30/2017 By ANC
5/30/17: The gross findings confirm that acute trauma due to window strike is the cause of death in this bird. Tissues are not saved for histology and this will serve as a final report.

Andrew Cartoceti	Andrew Cartoceti	5/30/2017
PROSECTOR	PATHOLOGIST	DATE COMPLETED

Printed on: 5/31/2017 10:49:58 AM CARES-MED v2.119

Pathology Module - Final Pathology Report
NATIONAL ZOOLOGICAL PARK

PATH # W2017-0060

Death Date: 6/10/2017
Necropsy Date: 6/13/2017

PASSER DOMESTICUS (no subsp) Gender: Male Accession No.: ÿ02957
House sparrow Age: Birth:
Name: W2017-0060 Acquired:

SEX: Male AGE: ADULT WEIGHT: 26.7 gm STAY:

MANNER OF DEATH: Found Dead INTERVAL: > 72 hours
TIME OF DEATH: 09:00A XRAYED: False
DEATH LOCATION: Bird House DISPOSITION: INCINERATE
SUBMITTOR: Eric Slovak PROSECTOR: Andrew Cartoceti
OWNER/ANIMAL DEPT: OUT

HISTORY AND CLINCICAL OBSERVATIONS:

KEEPER OBSERVATIONS: On 6/10/2017 By ES

Possible window strike. Bird found at bottom of glass, side of entry vestibule to the bird house.

CLINICIAN OBSERVATIONS: On By

GROSS DESCRIPTION: On 6/13/2017 By ANC

An adult, male, house sparrow is necropsied on 13 June 2017 after being found dead by the side door at Bird House. The carcass in fair postmortem condition and good nutritional state with well-fleshed pectoral muscles and small subcutaneous and intra-coelomic adipose stores. There is mild hemorrhage into the skeletal muscles at the base of the skull and cranial cervical vertebrae. The remaining organs are grossly unremarkable.

GROSS DIAGNOSIS: By ANC

Skeletal muscle, caudal skull/cranial spine: Mild, focally extensive, acute hemorrhage (suspect window strike)

LABORATORY STUDIES:

TISSUE STATUS:

No fixed tissues taken.

Tissues Ultrafrozen:

SPECIAL REQUESTS: On By

HISTOLOGY: On By

MORPHOLOGIC DIAGNOSIS:

REMARKS: On 6/13/2017 By ANC

6/13/17: The gross findings are suggestive of acute trauma, likely from window strike, as the cause of death. Histology will not be performed and this will serve as a final report.

Andrew Cartoceti	Andrew Cartoceti	6/13/2017
PROSECTOR	PATHOLOGIST	DATE COMPLETED

Printed on: 6/13/2017 11:27:53 AM CARES-MED v2.119

Pathology Module - Final Pathology Report
NATIONAL ZOOLOGICAL PARK

PATH # W2017-0065

Death Date: 6/13/2017
Necropsy Date: 6/13/2017

PROCYON LOTOR (no subsp) Gender: Male Accession No.: ÿ02958
Raccoon Age: Birth:
Name: W2017-0065 Acquired:

SEX: Male AGE: JUVENILE WEIGHT: 1.215 kg STAY:

MANNER OF DEATH: Found Dead
TIME OF DEATH: 09:30A
DEATH LOCATION: Parking lot D
SUBMITTOR: Leigh Pitsko
OWNER/ANIMAL DEPT: OUT

INTERVAL: 0-6 hours
XRAYED: False
DISPOSITION: INCINERATE
PROSECTOR: Andrew Cartoceti

HISTORY AND CLINCICAL OBSERVATIONS:

KEEPER OBSERVATIONS: On 6/13/2017 By LP

CLINICIAN OBSERVATIONS: On By

GROSS DESCRIPTION: On 6/13/2017 By ANC

A juvenile, male, raccoon is necropsied on 13 June 2017 after being found dead in parking lot D. The carcass is in poor postmortem condition with numerous maggots in the skin, bloating of the gastrointestinal tract and gas production in some visceral. The carcass is in fair body condition with well fleshed muscles and thin adipose stores. The bones of the skull are fractured in many places and there is acute hemorrhage into the subcutis. The brain is macerated. There is subcutaneous hemorrhage along the left and right cranial thorax and the underlying ribs are fractured with lacerations in the intercostal muscles. The remaining organs are grossly unremarkable.

GROSS DIAGNOSIS: By ANC

Skull: Multiple, severe, acute, fractures with subcutaneous hemorrhage and brain laceration
Ribs: Multiple, severe, acute rib fractures with subcutaneous hemorrhage and intercostal muscle laceration

LABORATORY STUDIES:

TISSUE STATUS:

No fixed tissues taken.

Tissues Ultrafrozen:

SPECIAL REQUESTS: On By

HISTOLOGY: On By

MORPHOLOGIC DIAGNOSIS:

REMARKS: On 6/13/2017 By ANC

6/13/17: The gross findings are consistent with death due to acute trauma, likely from being hit by a vehicle. The brain was crushed and was not suitable for Rabies virus testing. Histology will not be performed and this will serve as a final report.

Andrew Cartoceti	Andrew Cartoceti	6/13/2017
PROSECTOR	PATHOLOGIST	DATE COMPLETED

Printed on: 6/13/2017 11:41:30 AM CARES-MED v2.119

Pathology Module - Final Pathology Report
NATIONAL ZOOLOGICAL PARK

PATH # W2017-0094

Death Date: 7/14/2017
Necropsy Date: 7/14/2017

ACCIPITER COOPERII
Cooper's hawk
Name: W2017-0094

Gender: Female
Age:

Accession No.: ÿ02989
Birth:
Acquired:

SEX: Female AGE: ADULT WEIGHT: 404.5 gm STAY: <= 30 Days

MANNER OF DEATH: Euthanasia
TIME OF DEATH: 14:00
DEATH LOCATION: W
SUBMITTOR: Kendra Bauer
OWNER/ANIMAL DEPT: OUT

INTERVAL: 0-6 hours
XRAYED: False
DISPOSITION: INCINERATE
PROSECTOR: Andrew Cartoceti

HISTORY AND CLINCICAL OBSERVATIONS:

KEEPER OBSERVATIONS: On By

CLINICIAN OBSERVATIONS: On 7/14/2017 By KB

Hawk found in zoo unable to fly near RDC and easily picked up by keeper. Brought to WHS and noted to have poor body condition and dislocated L coxofemoral joint. While in hand, became dyspnic. Euthanized with euthasol and KCl IV.

GROSS DESCRIPTION: On 7/14/2017 By ANC

An adult, 404.5 gram, female Cooper's hawk is necropsied on 14 July 2017 following euthanasia. The carcass is in excellent postmortem condition and poor to fair body condition with well-fleshed muscles and minimal subcutaneous and intra-coelomic adipose. There is blood within the oral cavity. The last two ribs on the right are fractured dorsally with hemorrhage into the surrounding muscle and subcutis. The left hip joint has severe laxity and crepitus. The joint capsule of the left hip is lacerated ventrally exposing the joint. The capital ligament is lacerated and half of the head of the femur is fractured off and remains in the acetabulum. There is abundant hemorrhage into the surrounding skeletal muscle and subcutis. Within the coelom, there is a large blood clot attached to the left middle kidney lobe. A smaller blood clot is loosely attached to a small laceration in the left liver lobe.

GROSS DIAGNOSIS: By ANC

Coxofemoral joint, left: Open, acute, luxation with capital ligament laceration and avulsion fracture of femoral head
Ribs, right: Simple, transverse, non-displaced, acute fractures
Liver, left lobe: Acute, focal laceration with hemorrhage
Body as a whole: Poor to fair body condition

LABORATORY STUDIES:

TISSUE STATUS:

No fixed tissues taken.

Tissues Ultrafrozen:

SPECIAL REQUESTS: On By

HISTOLOGY: On By

MORPHOLOGIC DIAGNOSIS:

REMARKS: On 7/14/2017 By ANC

7/14/17: The gross findings are consistent with acute trauma, likely from a collision during flight. Histology will not be performed and this will serve as a final report.

Andrew Cartoceti	Andrew Cartoceti	7/14/2017
PROSECTOR	PATHOLOGIST	DATE COMPLETED

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Pathology Module - Final Pathology Report
NATIONAL ZOOLOGICAL PARK

PATH # W2017-0099

Death Date: 7/23/2017
Necropsy Date: 7/24/2017

PROCYON LOTOR (no subsp) Gender: Unknown Sex Accession No.: ÿ02995
Raccoon Age: Birth:
Name: W2017-0099 Acquired:

SEX: Unknown Sex AGE: ADULT WEIGHT: 3.024 kg STAY:

MANNER OF DEATH: Euthanasia
TIME OF DEATH: 12:15P
DEATH LOCATION: WHS
SUBMITTOR: JCS
OWNER/ANIMAL DEPT: OUT

INTERVAL: 6-24 hours
XRAYED: False
DISPOSITION: INCINERATE
PROSECTOR: Andrew Cartoceti

HISTORY AND CLINCICAL OBSERVATIONS:

KEEPER OBSERVATIONS: On By

CLINICIAN OBSERVATIONS: On 7/23/2017 By JCS

Neurologic raccoon found by FONZ staff by C lot entrance. Evaluated by duty curator (SS) and deemed abnormal. Attempted to capture and at that time was noted to have a gran mal seizure lasting 2-3 minutes. Due to concerns for severe neurologic disease euthanasia performed after IM sedation with ketamine, telazol, xylazine. Euthanasia performed with intracardiac euthasol (3 ml). Suspect distemper, but due to human exposure by (S. Sarro) please perform rabies testing.

GROSS DESCRIPTION: On 7/24/2017 By ANC

A 3.024 kilogram, adult, female raccoon is necropsied on 24 July 2017 following euthanasia. The carcass is in good postmortem condition and good nutritional state with well-fleshed muscles and adequate subcutaneous and intra-abdominal adipose. There are abrasions on the skin of the muzzle, over the left and right hips and the mid tail, with multiple dried scabs. The lungs are pink, soft and float in formalin. The stomach contains granular grey brown ingesta and the colon is empty. The brain, trachea, esophagus, thyroid glands, heart, liver, gallbladder, spleen, kidneys, adrenals, urinary bladder, uterus and ovaries are grossly unremarkable.

GROSS DIAGNOSIS: By ANC

Skin, chin, left and right dorsal pelvis, tail: Multiple subacute to chronic abrasions with scabbing

LABORATORY STUDIES:
OTHER: Brain - Rabies FA

TISSUE STATUS:

SHELVED:	True
TRIMMED:	False
FROZEN:	False
ULTRAFROZEN:	False

Tissues Ultrafrozen:

SPECIAL REQUESTS: On By

HISTOLOGY: On By

MORPHOLOGIC DIAGNOSIS:

REMARKS: On 8/1/2017 By ANC

8/1/17: Rabies virus infection was confirmed via FA testing of the brain. This concludes all diagnostic testing.

Andrew Cartoceti	Andrew Cartoceti	8/1/2017
PROSECTOR	PATHOLOGIST	DATE COMPLETED

Printed on: 8/1/2017 10:35:00 AM CARES-MED v2.119

Pathology Module - Final Pathology Report
NATIONAL ZOOLOGICAL PARK

PATH # W2017-0100

Death Date: 7/25/2017
Necropsy Date: 7/26/2017

VULPES VULPES (no subsp) | Gender: Unknown Sex | Accession No.: ÿ02996
Red fox | Age: | Birth:
Name: W17-0100 | | Acquired:

SEX: Unknown Sex | AGE: ADULT | WEIGHT: 0 gm | STAY:

MANNER OF DEATH: Found Dead
TIME OF DEATH:
DEATH LOCATION: Blue Road
SUBMITTOR: DMY/KLH
OWNER/ANIMAL DEPT: OUT

INTERVAL: 6-24 hours
XRAYED: False
DISPOSITION: INCINERATE
PROSECTOR: Andrew Cartoceti

HISTORY AND CLINCICAL OBSERVATIONS:

KEEPER OBSERVATIONS: On 7/25/2017 By DMY

Staff member at the Science Building called WHS Hotline - noticed a dead fox on the road towards science hill/vet hospital.

CLINICIAN OBSERVATIONS: On By

GROSS DESCRIPTION: On 7/26/2017 By ANC

An adult, female, red fox is necropsied on 26 July 2017. The carcass is in good postmortem condition and good nutritional state with well-fleshed muscles and adequate adipose stores. There is suffusive hemorrhage in the subcutis and skeletal muscle over the dorsal and lateral neck and left thoracic wall. The abdomen is filled with thick blood and a 1.5 cm diameter region of the liver capsule is roughened and reddened (suspect liver fracture). Cursory examination of the lungs, spleen, kidneys and intestinal tract is unremarkable.

GROSS DIAGNOSIS: By ANC

Liver: Focal acute fracture with marked hemoabdomen
Subcutis, skeletal muscle (neck and thorax): Moderate, acute, hemorrhage
Body as a whole: Good body condition

LABORATORY STUDIES:
OTHER: Rabies FA

TISSUE STATUS:

No fixed tissues taken.

Tissues Ultrafrozen:

SPECIAL REQUESTS: On By

HISTOLOGY: On By

MORPHOLOGIC DIAGNOSIS:

REMARKS: On 8/1/2017 By ANC

8/1/17: Rabies virus was confirmed on FA of the brain. Impairment by rabies infection may have contributed to this fox's traumatic injuries (suspected hit by car). This concludes all diagnostic testing.

Andrew Cartoceti	Andrew Cartoceti	8/1/2017
PROSECTOR	PATHOLOGIST	DATE COMPLETED

Printed on: 8/1/2017 10:38:50 AM CARES-MED v2.119

Pathology Module - Final Pathology Report
NATIONAL ZOOLOGICAL PARK

PATH # W2017-0119

Death Date: 8/30/2017
Necropsy Date: 8/30/2017

RATTUS NORVEGICUS (no subsp) Gender: Unknown Sex Accession No.: y03015
Norway rat Age: Birth:
Name: W2017-0119 Acquired:

SEX: Unknown Sex AGE: WEIGHT: 410 gm STAY:
MANNER OF DEATH:Found Dead INTERVAL:0-6 hours
TIME OF DEATH: XRAYED:False
DEATH LOCATION:BH31 DISPOSITION:INCINERATE
SUBMITTOR:Talbott PROSECTOR:Holder
OWNER/ANIMAL DEPT:OUT

HISTORY AND CLINCICAL OBSERVATIONS:

KEEPER OBSERVATIONS: On By

CLINICIAN OBSERVATIONS: On By

GROSS DESCRIPTION: On 8/30/2017 By KAH

Presented for necropsy is an intact adult gravid female Norway rat. Body condition and postmortem condition are adequate. The stomach is full of yellow ingesta.
All lung fields are mottled dark red and slightly firm with cranial lobes most affected. Left cranial lung lobe sinks in formalin. There are multifocal 2-3 mm pale tan foci on the liver. The uterus contains several fetuses in each horn. The mammaries and nipples are prominent.
No other gross abnormalities are noted.

GROSS DIAGNOSIS: By KAH

Lung: Bronchopneumonia, severe.
Liver: Granulomatous hepatitis.

LABORATORY STUDIES:

TISSUE STATUS:

SHELVED:	False
TRIMMED:	True
FROZEN:	False
ULTRAFROZEN:	True

Tissues Ultrafrozen: lung, liver

SPECIAL REQUESTS: On By

HISTOLOGY: On 9/19/2017 By KAH

1. LUNG
2. LIVER, HEART
3. SPLEEN, STOMACH, GI, KIDNEY
4. FETUS, PLACENTA

MORPHOLOGIC DIAGNOSIS:

1) Lung: Bronchopneumonia, necrosuppurative to pyogranulomatous, severe, with consolidation, and hemorrhage.
2) Liver: Eosinophilic to granulomatous hepatitis, multifocal, moderate, with fibrosis, calcification, and intralesional nematode eggs consistent with
3) Small intestine: Enteritis, lymphoplasmacytic and eosinophilic, mild, with intraluminal nematodes.
4) Spleen: Reactive lymphoid hyperplasia.

REMARKS: On 9/19/2017 By KAH

As suspected grossly, the cause of death in this animal was severe pneumonia as well as hepatic granulomas. An infectious agent, likely bacterial, is suspected for the pneumonia. While the lung was not cultured, liver and lung are available in the -80 freezer if additional diagnostics are warranted. Capillaria hepatica is a common parasite of wild rats. It can infect other mammals, including humans, though human infection is uncommon.

Holder	Holder	9/19/2017
PROSECTOR	PATHOLOGIST	DATE COMPLETED

Printed on: 9/19/2017 5:11:16 PM CARES-MED v2.119

Pathology Module - Final Pathology Report
NATIONAL ZOOLOGICAL PARK

PATH # W2017-0127

Death Date: 10/14/2017
Necropsy Date: 10/16/2017

MUS MUSCULUS (no subsp)
House mouse
Name: W2017-0127

Gender: Unknown Sex
Age:

Accession No.: y03023
Birth:
Acquired:

SEX: Unknown Sex AGE: ADULT WEIGHT: 0 gm STAY:

MANNER OF DEATH:Euthanasia
TIME OF DEATH:
DEATH LOCATION:SMH 33
SUBMITTOR:Ashton Ball
OWNER/ANIMAL DEPT:OUT

INTERVAL:48-72 Hours
XRAYED:False
DISPOSITION:INCINERATE
PROSECTOR:Holder

HISTORY AND CLINCICAL OBSERVATIONS:

KEEPER OBSERVATIONS: On 10/14/2017 By AB

Small mouse found alive in saki monkey food pan in SMH 33. Mouse was alive but volunteer was able to pick up mouse with out a struggle. Mouse was euthanized at SMH.

CLINICIAN OBSERVATIONS: On By

GROSS DESCRIPTION: On 10/16/2017 By KAH

Hemorrhage noted subcutaneous on dorsal thorax and within thoracic cavity surrounding left lung.

GROSS DIAGNOSIS: By KAH

Thoracic cavity: Hemothorax
Subcutis: Hemorrhage

LABORATORY STUDIES:

TISSUE STATUS:

SHELVED:	False
TRIMMED:	False
FROZEN:	False
ULTRAFROZEN:	False

Tissues Ultrafrozen:

SPECIAL REQUESTS: On By

HISTOLOGY: On By

MORPHOLOGIC DIAGNOSIS:

REMARKS: On 10/16/2017 By KAH

Cause of moribundity is likely trauma. No histopathology performed.

Holder	Holder	10/16/2017
PROSECTOR	PATHOLOGIST	DATE COMPLETED

Printed on: 10/16/2017 5:13:05 PM CARES-MED v2.119

Pathology Module - Final Pathology Report
NATIONAL ZOOLOGICAL PARK

PATH # W2017-0128

Death Date: 10/18/2017
Necropsy Date: 10/18/2017

GEOTHLYPIS TRICHAS — Gender: Unknown Sex — Accession No.: y03024
Common yellowthroat — Age: — Birth:
Name: W2017-0128 — Acquired:

SEX: Unknown Sex AGE: WEIGHT: 10.1 gm STAY:
MANNER OF DEATH: INTERVAL:0-6 hours
TIME OF DEATH: XRAYED:False
DEATH LOCATION:Think Tank DISPOSITION:INCINERATE
SUBMITTOR:Matt Spence / Primates PROSECTOR:Holder
OWNER/ANIMAL DEPT:

HISTORY AND CLINCICAL OBSERVATIONS:

KEEPER OBSERVATIONS: On 10/18/2017 By MS

Appeared to strike the glass outside of the orangutan outdoor enclosure at Think Tank. [panel #5]

CLINICIAN OBSERVATIONS: On By

GROSS DESCRIPTION: On 10/18/2017 By KAH

Presented for necropsy is a common yellowthroat of undetermined sex. Plumage is consistent with famale or juvenile male. Body condition is adequate with notable subcutaneous fat. Postmortem condition is mildly autolyzed. The caudal body vall is opened and viscera are protruding. The carcass is covered in ants.

Upon reflection of the skin, there is marked subcutaneous hemorrhage over the cranium, and the cranium is partially crushed.

GROSS DIAGNOSIS: By KAH

Cranial trauma

LABORATORY STUDIES:

TISSUE STATUS:

No fixed tissues taken.

Tissues Ultrafrozen:

SPECIAL REQUESTS: On By

HISTOLOGY: On By

MORPHOLOGIC DIAGNOSIS:

REMARKS: On 10/19/2017 By KAH

Trauma noted on the carcas is most consistent with predation, but stunning by collision cannot be ruled out as a predisposing event. Histopathology will not be performed. This will serve as the final report.

Holder	Holder	10/19/2017
PROSECTOR	PATHOLOGIST	DATE COMPLETED

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