

MARINE MAMMAL NECROPSY REPORT FORM

FIELD I.D. HS8695
RECOVERY DATE 24 April 2018
GENDER Female **TL** 329 **cm** **WT** 813 **kg**

SPECIES *T. manatus latirostris*
NECROPSY DATE 25 April 2018
CONDITION Badly Decomposed

HISTORY 24 April 2018, at 0821 hrs, FWC biologist-Andy Garrett received a phone call from veterinarian-Ray Ball stating that long-term captive manatee HS8695 ("Lorelei") had been found dead that morning by Homosassa Wildlife State Park staff. Park staff were going to hoist her out of the exhibit using a crane. FWC biologist-Gina Lonati (GLL) departed the MMPL with the U-trailer at 0915 hrs and stopped at Bob Lee's in St. Petersburg to fill the trailer tires with air. GLL departed Bob Lee's at 1004 hrs and arrived at the park at 1131 hrs. The carcass was lifted into the U-trailer with the crane at 1152 hrs. GLL transported the carcass to the MMPL arriving at approximately 1330 hrs.

EXTERNAL All of the epidermis was present. Bloody fluid exuded from the eyes and nares. In ventral recumbency, the carcass had transverse folds on the ventrum. The peduncle had a loose skin fold. The dorsal and lateral head and neck had skin rolls. There were patches of cobblestone-like epidermis on the dorsum and dorsal and ventral fluke. The epidermis of the ventrum and flippers was mostly white with areas of grey mottling. A few regions of epidermis in the axillae (lesion D) and mid ventrum (lesion C) were pink. One superficial small linear healing lesion surrounded by thickened white epidermis was present on the right caudal lateral aspect (lesion A). A few mostly healed circular lesions were present on the cranial ventrum. There were a few well-healed circular scars on the ventral fluke and lateral aspects of the flippers. There was a band of slightly raised white mottled epidermis along the right dorso-lateral aspect (see photo) (lesion B). An irregular-shaped healing lesion surrounded by thickened white epidermis was observed at the 11 o'clock position of the fluke margin. The fluke margin had a well-healed ruffled appearance. Well-healed scars were observed on the dorsal fluke, right cranial dorso-lateral aspect, and ventrum and ventral peduncle. There was a thin green algal mat on all aspects. PIT tag scan was negative. A genetics sample was collected.

ABDOMINAL There was very abundant abdominal, mesenteric, and omental fat (see photo). There was 2 L of red-brown fluid in the abdominal cavity.

STOMACH The stomach contained 4 L of wet, fibrous, well-chewed, dark green ingesta mixed with well-chewed pieces of soft, orange ingesta. No parasites were observed. The mucosa was yellow and green. The wall of the major curvature had a region with several small pitted lesions in proximity of firm white tissue (see photos). An ELISA toxicology sample was collected.

DUODENUM The duodenum contained 1.25 L of wet, fibrous, well-chewed, green ingesta mixed with well-chewed pieces of soft, orange ingesta. Two dead nematodes were observed. The mucosa was discolored dark green.

JEJUNUM & ILEUM The small intestine serosa was mildly congested. The proximal small intestine contained a small amount of watery, moderately chewed, slightly fibrous, leafy, poorly formed, dark green to brown ingesta. The mucosa was sloughing and gassy. The mid and distal small intestine contained a small amount of watery, moderately chewed, leafy, poorly formed, dark brown ingesta. The mucosa was sloughing. No parasites were grossly observed throughout.

CECUM The cecum was very enlarged (approximately 37 x 33 x 27 cm, not including cecal horns, see photo) and contained 30 L of compact digesta. The outer-most 2.5 cm layer of contents consisted of moist, fibrous, moderately digested, dark green digesta mixed with 3 cm long fibrous light yellow to tan stringy material. The remainder of the contents consisted of slightly moist, very stringy, very fibrous, poorly digested, firm, hay-like, green to yellow digesta. The vessels on the serosa distal to the cecal horns were dilated (see photo). The

mucosa was sloughing. There were a few small regions of congestion in the cecum wall (see photo). One dead trematode was observed.

COLON The colon was distended with gas. The proximal colon had regions that were empty of contents and regions that contained a moderate amount of moist, well-formed, poorly digested, very fibrous, stringy, compact, yellow to green feces that were reduced in diameter. The mid colon had regions that were empty of contents and regions that contained slightly moist, well-formed, poorly digested, very fibrous, stringy, compact, yellow to dark green fecal boluses. The distal colon contained a small amount of wet, slightly fibrous, poorly formed, well-digested, brown feces. No parasites were observed throughout. The proximal and mid colon mucosa was sloughing. The distal colon mucosa was autolyzed.

PANCREAS The pancreas was soft, friable, and autolyzed.

SPLEEN The spleen was small, soft, and friable. Serosal surfaces were mottled purple and dark purple, and cut surfaces were dark red.

LIVER The liver was soft, friable, and autolyzed. An ELISA toxicology sample was collected.

GALLBLADDER The gallbladder contained approximately 15 mL of golden yellow bile. The mucosa was bile-stained.

REPRODUCTIVE There was abundant reproductive fat. The uterine horns appeared thickened (see photo). No uterine scars were observed. The ovaries had large (maximum diameter 2.0 cm) and small follicles.

KIDNEYS The kidney capsules were distended with gas. There was abundant perirenal fat. The kidneys were slightly friable when handled. Serosal surfaces were brown and red. On cut surfaces, the cortices were light red and the medullae were brown. The corticomedullary boundaries were indistinct. An ELISA toxicology sample was collected.

URINARY BLADDER The bladder contained approximately 20 mL of cloudy, red urine. The mucosa was unremarkable. An ELISA toxicology sample was collected.

HEART There was very abundant epicardial fat. The connective tissue between the heart and sternum was thick (approximately 5 cm), fatty, and gassy (see photo). The heart was soft, friable, and autolyzed. The myocardium was very gassy. The right ventricle and atrium contained blood clots. The right ventricle and atrium were more autolyzed than the left, but the ratio of the ventricular walls and lumen appeared unremarkable. Valves were unremarkable.

RESPIRATORY SYSTEM Both hemidiaphragms were intact. There was approximately 750 mL of watery red fluid in each pleural cavity. The lungs were mottled pink and dark red on serosal surfaces, and dark red on cut surfaces. The airways contained a small amount of watery red fluid. There was a mild infection of dead trematodes in the right airways. The mucosa was red. An ELISA toxicology sample was collected.

HEAD & NECK REGIONS There was a non-functional PIT tag in the muscle of the mid dorsal head. The trachea contained a small amount of red froth. The mucosa was gassy. The teeth were unremarkable. Both earbones were collected.

SKELETON NVL.

OTHER The muscle between the inner and outer fat layer and in the peduncle had thin streaks of fat marbling.

PHOTOGRAPHS FWC022_2018-04-24_5352 through 5393; FWC022_2018-04-25_5398, 5403 through 5405, 5420, 5424, 5432, 5436, 5439 through 5446, 5451, 5455, 5463, 5466, 5467, 5484 through 5488, 5490 through 5494, 5507 through 5510; FWC033_2018-04-25_3325, 3326, 3331 through 3340; FWC033_2018-04-27_3343 through 3345, 3347 through 3362.

COMMENTS There were abundant fats but the skin folds suggested there had been some weight loss, which is consistent with the anorexia reported in the clinical history of this manatee.

DISCUSSION ON POSSIBLE CAUSE (MdW)

The most significant finding on gross necropsy was a cecum impaction with fibrous material. A retrospective review of the mortality database with 193 manatees of this size range, suggests a normal cecum volume of approximately 1 - 4 liters. One previous case reported an abnormally distended cecum with 8.25 liters of compact digesta, which was associated with a colon impaction. The cecum volume of 30 liters observed in this case is almost four times the highest volume previously reported in manatee mortality records. Stage of decomposition precluded thorough evaluation of pathology of internal organs and definitive diagnosis of the cause of the impaction.

Impaction primarily located in the cecum has not been documented in manatees before. In horses, a primary cecal motility dysfunction can be caused by nervous degeneration. Lesions suggestive of primary dysautonomia (neurological degeneration) were not found in Lorelei's GI tract. Secondary causes in horses include poor dentition in older animals, decreased water intake, feeding of coarse roughage, administration of nonsteroidal anti-inflammatory drugs, and/or parasite infections.

There was mild fibrosis observed in a kidney sample. Blood data of this manatee between 12 October 2017 and 17 April 2018 show a tendency towards hypoproteinemia, as well as hypercholesterolemia, which may suggest chronic renal disease with protein loss. Kidney failure can lead to dehydration, and secondary constipation in the GI tract. This is often seen in manatees with chronic cold stress syndrome, where the distal colon contains dry, hard, brittle and/or crumbly feces. In Lorelei however, the impaction occurred more proximally than in constipated cold stress cases, and the digesta were not dried out as seen in these cases. Despite the stringy, fibrous nature of the digesta, most of the contents were moist, especially along the periphery of contents, suggesting there was still hydration in the GI wall. Limitations in assessing manatee kidney function and in available blood data, as well as the decomposition of tissues, make definitive conclusions on Lorelei's kidney status at time of death impossible.

Mild fibrosis was also noted in a sample of the left heart ventricle, but most of the heart was too autolyzed for more thorough sampling. It is unclear if there was any effect on heart function, pre-mortem clinical data such as ECG could provide more information.

There was no gross or microscopic evidence of reproductive pathology.

References:

- AJ Dart, DR Hodgson, and JR Snyder. 1997. Caecal disease in equids. *Australian Veterinary Journal* 75(8):552-557.
- A Desrochers, G St-Jean. 1995. Cecal impaction in a cow. *Canadian Veterinary Journal* 36:430-431.
- MJL Kik, MH van der Hage. 1999. Cecal impaction due to dysautonomia in a llama. *Journal of Zoo and Wildlife Medicine* 30(3):435-438.
- AE Plummer. 2009. Impactions of the small and large intestines. *Veterinary Clinics of North America: Equine Practice* 25(2):317-327.
- S Westgarth, A Singh, AR Vince. 2013. Subclinical cecal impaction in a dog. *Canadian Veterinary Journal* 54:171-173.

SIGNIFICANT FINDINGS

- Autolyzed internal organs
- Bloody eyes, nares
- Skin folds
- Severely distended cecum filled with excessive amount of digesta (impaction)
- Congested cecum wall
- Poorly digested cecum, colon contents
- Relatively empty colon

- Stomach lesions
- Fluid in pleural cavities
- Very abundant fats with fat marbling in muscle
- Cobblestone-like epidermis
- White discoloration of epidermis
- Healing skin lesions
- PIT tag in dorsal head

PROBABLE CAUSE OF DEATH Undetermined; Too Decomposed

NECROPSY CONDUCTED BY

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