

CONFIDENTIAL AND PRIVILEGED INFORMATION

VDL PATHOLOGY NUMBER: 25-01126

STRANDING DATE/DATE FIRST SEEN: 14/03/2025 first seen deceased

Animal seen alive? Yes – last seen alive on the 11/03/2025

RECOVERY DATE: 15/03/2025 by National Parks and Wildlife Service, Marine Parks

STRANDING REPORTED BY:

EXAMINATION PERFORMED BY:

DATE OF EXAMINATION: 09/04/2025

LOCATION OF STRANDING:

Latitude: S -34.814750°

Longitude: E 138.512006°

WEATHER CONDITIONS AROUND TIME OF STRANDING: fine and sunny

NUMBER OF ANIMALS STRANDED: 1

STORAGE PRIOR TO NECROPSY: Frozen

DEGREE OF AUTOLYSIS: Code 3 (Geraci and Lounsbury, 2005)

SIGNALMENT (species/ age/ sex): *Tursiops sp.*, male, neonate (rostral vibrissae, fetal folds, open umbilicus)

WEIGHT (kg): 14.6

LENGTH (cm): 100.2

HISTORY: A stranded deceased Indo-Pacific bottlenose dolphin (*Tursiops aduncus*) neonate was reported by to Department of Environment and Water (DEW), National Parks and Wildlife Service, Marine Parks on the 14th of March 2025. The animal was observed being pushed around by its mother in Snowden's beach area. The animal was collected by DEW marine parks rangers the following day and transported to their facilities at Regency Park where it was stored frozen. The animal was later transported to Roseworthy Veterinary Diagnostic Laboratory, the University of Adelaide on the 7th of April 2025 where it was placed in the cool room for defrosting prior to necropsy. Necropsy was performed on the 9th of April 2025.

This individual was neonate of known Adelaide Dolphin Sanctuary (ADS) resident female, Ali. Estimated to be only a week old (first sighted on the 8th of March 2025), it was last seen alive on the 11th. This is the first known calf of Ali. Ali was born in February 2011 and is approximately 14 years of age at the time this calf was born. Ali was orphaned in October 2011 when her mother, Millie, died from a presumptive boat strike. Ali spends all of her time in the Port River (information courtesy of).

SUMMARY: The cause of death for the ADS neonate (Ali's neonate) is determined as blunt force trauma. The exact cause remains unknown; however, the evidence favours infanticide, characterised by the semicircular external ulceration on the left lateral head with underlying subcutaneous haematoma formation and a severe complex fracture of the skull with associated haemorrhage. Another possible cause for this degree of trauma is boat strike.

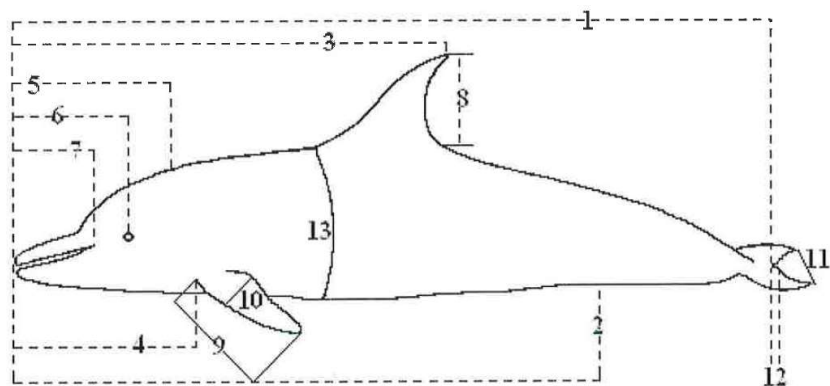
Circumstance of Death: Trauma – blunt force trauma suggestive of infanticide (favoured) or boat strike (Segawa and Kemper, 2015)

Image courtesy DEW, Marine Parks Rangers when the animal was first recovered.

Morphometric Measurements

1. Total length (tip of upper jaw to deepest part of fluke notch): 102 mm	9. Length of flipper (anterior to tip): 210 mm
2. Tip of upper jaw to centre of anus: 721 mm	10. Width of flipper (maximum): 75 mm
3. Tip of upper jaw to tip of dorsal fin: 660 mm	11. Width of tail flukes: 245 mm
4. Tip of upper jaw to anterior insertion of flipper: 285 mm	12. Depth of notch between flukes: 22 mm
5. Tip of upper jaw to blowhole: 145 mm	13. Maximum girth (+ distance from upper jaw): 650 mm (470 mm)
6. Tip of upper jaw to centre of eye: 185 mm	14. Girth at anus: 361 mm
7. Length of gape: 145 mm	15. Girth at eye: 510 mm

8. Height of dorsal fin (tip to base): 103 mm	
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Condition of Animal and Skin

Body Condition: thin

Presence or absence of:

1. Dorsal concavity behind the head = 1
2. Concavity along the lateral body = 1
3. Convexities along the lateral peduncle = 0
4. Convexities in the thorax = 0

Rate absent (0), 1 (visible but not extreme condition), 2 (clearly visible/extreme condition)

Skin and Subcutis Condition (colour/ condition):

The external skin surface displayed mild to moderate skin sloughing around the peduncle region and mild to moderate postmortem scavenger damage. There were linear incisional cuts in multiple directions and of varying textures most prominent around the cranial half of the body and over the head and neck. Some of these incisional cuts were more parallel in nature and extended the depth of the epidermis only, resembling rake marks from other dolphins. The epidermis was also missing on a large portion of the dorsal head. On the left side of the body, dorsal to the pectoral fin, there was an irregular shaped ulceration extending into the underlying musculature. There was no haemorrhage or evidence of a host response in association with this lesion. Some external darkening of the skin was noted in the mandibular region with mild haemorrhage subcutaneously in this region (Image 6). However, it is important to note that subcutaneous haemorrhage as an artifact of freeze-thaw is possible (Roe et al., 2012). The penis was protruding from the genital slit, likely the result of post mortem change.

Of most significance was the 20mm x 6mm semicircular ulceration on the left side of the head. This ulceration had an obvious associated host response with subcutaneous haematoma formation in the region underlying the lesion (Images 7 and 8). Haemorrhage was also noted down the lateral sides of the head, extending to the inner ear regions and skull base.

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.
- 8.

Blowhole

NAD.

Mouth

NAD. Rostral papillae on tongue – normal age-related finding.

Teeth Count: teeth not yet erupted

Eyes (discharge/ colour)

NAD

Ears

No abnormalities were detected at the external ear surfaces, however haemorrhage was noted internally surrounding the ears.

Genital Slit/ Anus

The penis was protruded – post mortem change/ decomposition. Otherwise, NAD

Umbilicus: open and pink

Body Cavities

Within both the thoracic cavity and abdominal cavity, there were moderate amounts (approximately 10-20 mL) of red, watery fluid (interpreted as postmortem/ freeze-thaw artifact). Moderate autolysis was noted over the external surface of the liver. The lungs displayed a bubbly appearance and were mottled pink to red over the pleural surfaces.

9.

10.

Gastrointestinal Tract

Oesophagus: Within the oesophagus was a small shellfish – possible post mortem artifact.

11.

Stomach: there was moderate sloughing of the mucosal layers of the stomach and no evidence of feed material.

Small intestine: NAD

Large intestine, colon and rectum: NAD

Peritoneum, mesentery, omentum: NAD

A section of the forestomach, glandular stomach, and duodenum was collected for histology.

12.

Liver

The liver was dark red with moderate autolysis. No abnormalities were detected; however, autolysis may have hindered detection of subtle findings. Samples for toxicology, molecular testing, and histology were collected. Weight = 330 g

Bile Duct/ Pancreaticoduodenal duct: NAD

Pancreas

NAD

Respiratory System

Larynx: NAD

Trachea and bronchi: NAD

Lungs: The lungs were incompletely collapsed, and mottled pink to red, and dark red medially. Over the pleural surfaces there was a bubbly appearance. The lungs felt consolidated over the cranioventral lung fields with the right being more severe. A sterile swab was taken for bacteriology and samples for molecular testing and histology were collected.

13.

14.

Circulatory System

Pericardium: NAD

Heart: NAD. A patent ductus arteriosus was noted – normal age-related finding.
Weight: 126.9 g

LV wall thickness: 12 mm

RV wall thickness: 8 mm

Samples for histology and molecular testing were collected.

Vessels: NAD

Lymphatic System

Spleen: the spleen was mottled dark purple and red, otherwise NAD. Samples were collected for histology and molecular testing. Weight = 12.4 g

Thymus: NAD. A sample was collected for histology and molecular testing. Weight = 9.8 g

Mesenteric lymph node: NAD. A sample was collected for histology.

Musculoskeletal System

Blubber: NAD. A sample was collected for toxicology and molecular testing.

Blubber thickness (cm)	Mid-dorsal (between head and dorsal fin)	18 mm
	Mid-ventral (just in front of umbilicus)	13 mm
	Lateral (right)	15 mm
	Lateral (left)	15 mm

Muscle: NAD. Samples were taken for molecular testing and histology.

Diaphragm: NAD.

Skeleton: there was a severe complex fracture of the skull along the skulls suture lines and radiated down to the skull base (basioccipital bone) where there was associated haemorrhage in the internal soft tissue structures surrounding the ears (blue arrow, Image 18). Radiographs of the head confirmed significant fracture along skull suture lines and no evidence of metallic objects (Images 19 and 20).

The skull, pectoral fins, cervical vertebrae, and thoracic vertebrae with associated first 5-6 ribs were collected and are stored frozen for later maceration and examination.

- 15.
- 16.
- 17.
- 18.
- 19.
- 20.

Urinary System

Kidneys: NAD. Samples were collected for histology and molecular testing.

Right: Weight = 64.6 g	Left: Weight: 61.8 g
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Bladder: NAD

Prostrate: NAD

Reproductive System

Penis: The penis was protruding from the genital slit. Otherwise, NAD.

Testes: NAD

Endocrine Glands

Thyroid/ Parathyroid: NAD. A sample was collected for histology. Weight: 1.2 g

Adrenal: NAD. Samples of the adrenal were collected for histology and molecular testing.

Right Weight: 1.2 g	Left Weight: 1.3 g
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Pituitary: not assessed

Brain

The brain was friable and did not maintain normal structural composition when removed from the skull. It was not possible to make any gross diagnoses. Frozen samples of the cerebrum were collected for molecular testing and portions of cerebrum and cerebellum were placed in formalin for histology.

Spinal Cord

NAD. A sample was collected for histology.

Vertebral Column

Not assessed.

Bone Marrow

Not assessed

Microbiology:

1. Right lung field: moderate growth of *Lactococcus lactis*
2. Gastrointestinal contents: moderate growth of *Enterococcus faecium*

Gross Morphological Diagnosis

1. Integument and skull
 - a. Multiple incisional cuts, some parallel in nature (resembling rake marks), over the head and dorsal surface
 - b. External ulceration with associated underlying haematoma formation, haemorrhage, and a severe complex fracture to the skull.

Microscopic findings

25-01126_slide 1

- Liver
 - Autolysed, otherwise NSF

25-01126_slide 2

- Left lung
 - The lungs are hypercellular diffusely throughout the airways with flocculant eosinophilic material. However, marked autolysis hinders definitive diagnosis.
 - Presumptive pneumonia

25-01126_slide 3

- Kidney
 - NSF

25-01126_slide 4

- Kidney
 - NSF

25-01126_slide 5

- Right ventricle of the heart
 - NSF

25-01126_slide 6

- Left ventricle of the heart
 - NSF

25-01126_slide 7

- Intraventricular septum heart
 - NSF

25-01126_slide 8

- Intestine
 - NSF

25-01126_slide 9

- Intestine and stomach
 - NSF

25-01126_slide 10

- Spleen
 - NSF
- Adrenal

- NSF

25-01126_slide 11

- Oesophagus
 - NSF
- Bladder
 - NSF

25-01126_slide 12

- Thyroid
 - Marked autolysis
- Liver
 - NSF

25-01126_slide 13

- Trachea
 - NSF
- Tongue
 - NSF

25-01126_slide 14

- Pancreas
 - NSF
- Lymph node
 - NSF
- Diaphragm
 - NSF

25-01126_slide 15

- Skeletal muscle
 - NSF

25-01126_slide 16

- Lymph node
 - NSF
- Testes
 - Immature
- Round ligament
 - Fibrin thrombus, no inflammation present.

25-01126_slide 17

- Penis
 - NSF

25-01126_slide 18

- Suspect gastric ulcer

- Marked autolysis

25-01126_slide 19

- Auditory canal
 - Marked blood vessels present, no evidence of haemorrhage or congestion.

25-01126_slide 20 – 24

- Brain
 - No signs of inflammation or infectious disease in brain sections

Microscopic Diagnosis:

1. Lungs: airway and interstitial hypercellularity, probable pneumonia (advanced autolysis)

Comments

The most significant postmortem finding in Case 25-01126 is a semicircular external cutaneous ulceration with underlying haematoma formation, haemorrhage, and a severe complex fracture to the skull. Surrounding this lesion and the nearby dorsal surfaces of the neonate, there were multiple incisional cuts, some resembling rake marks from other dolphins. Blunt force trauma to the head is interpreted as the cause of mortality. Furthermore, a presumptive pneumonia was detected and is discussed below.

Infanticide by adult bottlenose dolphins (*Tursiops truncatus*) has been reported in both neonate *T. truncatus* and other species (e.g., harbor porpoise (*Phocoena phocoena*)), with attacks targeted at young animals less than 1.5m in total length. High energy blunt impact, with or without associated teeth marks, and underlying shearing of blubber from the subcutaneous tissue and skeletal fractures are frequent necropsy findings in these animals (Ross and Wilson, 1996), with attacks targeting the head commonly reported. These attacks have been witnessed to occur with enough force to propel the neonate dolphin out the water (López et al., 2018). It is possible that the torque generated from an attack from an adult bottlenose dolphin at speed was enough to cause the soft tissue injuries and skull fractures observed in the current case. The reason behind these violent interactions is unknown; however, play practice, misdirected aggression, social disturbance, sexual frustration, or an attempt to induce oestrus in the mother (known as the sexual selection hypothesis), are suggested causes (Patterson et al., 1998, Kaplan et al., 2009, López et al., 2018). Additionally, removal of unwell young has been suggested (Ramos et al., 2022).

Vessel collisions have been reported in Adelaide Dolphin Sanctuary previously (Adamczak et al., 2018). Typically, these injuries are associated with propellor strikes characterised by parallel curvilinear lacerations, with young animals considered to be most vulnerable to boat strikes (Byard et al., 2013, Byard et al., 2012). Blunt force trauma associated with vessel collision has also been reported in a common dolphin (*Delphinus delphis*) in New

Zealand (Martinez and Stockin, 2013). The wound in the current case does not resemble that of a propellor injury; however, blunt force from a boat hull interaction cannot be ruled out.

This neonate displayed evidence of pneumonia, characterised by consolidated lungs at gross examination and hypercellularity within the pulmonary interstitium and airways microscopically. *Lactococcus lactis* was cultured from the lung field. This bacterium is known for its milk fermenting and probiotic capabilities (Wels et al., 2019). In *T. truncatus*, *Lactobacillus* spp. have been isolated from gastric fluid previously and is considered part of the dolphin microbiota (Diaz et al., 2013). To isolate this bacterium from the lungs and with a presumptive pneumonia, it is possible that this neonate suffered an aspiration pneumonia from material regurgitated from the gastrointestinal tract. However, the anatomical separation of a dolphins gastrointestinal and respiratory systems means aspirating feed material would be very unlikely. How this bacterium was cultured from the lungs remains unknown and could be an incidental, postmortem finding or environmental contaminant. The significance and source of this bacterium is undetermined in relation to this neonate's death. An underlying pneumonia causing demise may have been an instigator for infanticide in the current case.

Enterococcus faecium was cultured from the gastric contents. The source and significance of this bacterium remains unknown. However it is possible that it is a member of the dolphin microbiota, with *Enterococcus* spp. previously cultured from rectal and gastric swabs in *T. truncatus* (Diaz et al., 2013) and from the gastrointestinal tract of spotted dolphins (*Stenella attenuata*) (Bai et al., 2024). Additionally, this bacterium has been cultured from blowhole and oral cavity swabs from an ADS dolphin previously (Tallula post mortem report - 21.029).

It is important to mention that at an estimated 1 week old, the suture lines of the skull in this neonate were likely not fused and the formation of the skull base may still be incomplete (Rauschmann et al., 2006, Ríos y Loshuertos et al., 2019). Although some force would have been required to cause the significant lesions observed in the current case, the neonate is still vulnerable to trauma given its incomplete development.

The cause of death in the ADS neonate is considered blunt force trauma to the head, the cause of which remains unknown. However, the injuries observed exhibit strong resemblance to those described for known causes of infanticide by adult bottlenose dolphins.

Please feel free to contact us should you have any questions regarding this report.

References

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