Institute of Veterinary, Animal and Biomedical Sciences

PATHOLOGY REPORT

Submitter's Ref.:	Date Sent: 18/06/2014	Accession No.: **50998**

TO: Department of Conservation
Wairoa

Species: Cetacean (1)	Sex: Female	Age: Adult	Breed: Pygmy Sperm Whal
ID: Adult female #1	At Risk:	Affected: 7	Dead: 7
Owner: Department of Conservation		Prev. Accn.:	Type: Post Mortem

HISTORY
Four adult female pygmy sperm whales were found dead on Mahia beach 30/05/2014 and two live calves were also present which were then euthanased via gunshot. Two of the adult females were too decomposed and were not necropsied. During the necropsy of the two other fresh adult females, an adult male was found washed up further down the beach and this animal was then necropsied.

Because of time constraints, measurements of all the whales was undertaken, but necropsies were only performed on the two fresh adult females and the adult male (necropsies were not performed on the two calves and the two more decomposed adult females).

GROSS FINDINGS

- Total length: 2980mm
- Upper jaw to origin of dorsal fin: 1730mm
- Tip of upper jaw to anus: 2000mm
- Tip of upper jaw to genital slit: 1910mm
- Length of genital slit: 200mm
- Tip of upper jaw to insertion of flipper: 610mm
- Tip of upper jaw to blowhole: 330mm
- Length of gape: 170mm
- Dorsal fin height: 100mm
- Fluke width: 800mm
- Flipper length (internal): 380mm (external): 460mm
- Flipper width: 180mm
- Blubber depth (dorsal): 28mm (lateral): 35mm (ventral): 30mm
- Girth (axillary): 1800mm

This was an adult non-pregnant but lactating female in fairly good body condition, with good blubber thickness and hypaxial/epaxial muscle mass. She was in a good state of preservation within minimal skin sloughing/slippage. There were skin and superficial blubber excoriations with associated reddening over the point of the snout and tip of the lower jaw.

Small numbers (less than 10) cestode larvae (*Phyllobothrium* or *Monorygma* spp) were present in the blubber layer. No obvious anatomical distribution was noted.

On cut surface the lung parenchyma was deep red and oozed a large amount of white frothy fluid, which was also present throughout the entire trachea.

Both the squamous and glandular portions (compartments 1 and 2) of the stomach contained large numbers (>100) of nematodes as well as ~12 squid beaks, a similar number of squid or fish lens as well as ~6 tapered cylindrical opaque rubbery structures (possibly squid arms/ tentacles) and soft, spongy red, ribbon-like objects (possibly remnants of squid epidermis). Nematodes measured up to 80-100mm in length and floated free within the stomach lumen. The intestine was largely devoid of ingesta/digesta.

The left ovary contained a 30 x 10 x 10mm corpus luteum while the right ovary appeared quiescent. No foetus was present in either uterine horn.

Examination of the acoustic structures of the head (acoustic fat, pterygoid sinuses, periotic fat and the melon) revealed no obvious gross abnormalities. The pterygoid sinuses were empty and no parasites were observed. No haemorrhages or blood clots were observed in the brain case or over/in the meninges. No other abnormalities were noted on gross post mortem.

HISTOPATHOLOGY

- Lung: there is moderate to marked congestion while small numbers of alveolar spaces and small numbers bronchi contain fairly dense granular eosinophilic material or lighter, more flocculent pale eosnophilic materail (oedema); there are few alveolar macrophages.
- Liver: there is marked congestion of centrilobular and mid-zonal sinusoids. The majority of hepatocytes contain one large, or several smaller, fairly discrete and clear, intracytoplasmic vacuoles.
- Kidney: there is marked congestion.
- Adrenal gland: there is marked congestion.
- Brain: within the brainstem/proximal cervical spinal cord there are several areas in which variable numbers of erythrocytes are present in the perivascular space. Small caliber blood vessels throughout the brain are often surrounded by small amounts of clear space. There is diffuse moderate congestion of the neuropil and leptomeninges.
- Sections of heart, spleen, acoustic fat and mammary gland show no obvious abnormalities.

DIAGNOSIS
Unknown cause of stranding
Pulmonary oedema

COMMENTS
This was an adult non-pregnant and lactating female in good body condition and in a good state of preservation.

On gross visual inspection and histological examination of multiple internal organs including the brain, there was no indication of major trauma or an underlying disease process that might help explain why the animal stranded.

There was severe pulmonary oedema and congestion (fluid in the lung); this is likely due to the stress of stranding and progressive shock as blood starts to pool in the lungs and the cardiovascular system starts to shut down. This results in fluid from the bloodstream (minus the red blood cells) being squeezed/forced out into the small airways of the lung. This fluid then mixes with the small amount of fluid normally present in the lung (this is called surfactant) and the result is the formation of white frothy/foamy fluid and this is termed pulmonary oedema. This will prevent proper oxygen and carbon dioxide exchange in the lung. Pulmonary oedema can be caused by a variety of factors but has been reported in cetaceans that have stranded alive and subsequently died on the beach.

Gross examination of the acoustic structures of the head (including the melon, acoustic fats of the mandible and around the ear, pterygoid sinuses, meninges and brain) did not reveal any haemorrhages of blood clots that have been associated with sonar/seismic injury. Histological examination of multiple internal organs including the brain and acoustic nerve did not reveal any obvious evidence of gas/air emboli which have also been reported in association with sonar injury.

Histological examination of the brain showed several very small areas of haemorrhage in the brainstem. The haemorrhage is acute (occurred at or around the time or death) and was not associated with any inflammation, spongiosis (fluid accumulation within the brain substance) or injury/death of nearby neurons/neural tissue. In the absence of other evidence of haemorrhage and blood clots within the other acoustic structures of the head and elsewhere in the brain, the most likely explanation would be that the haemorrhage is the result in flucuations in blood flow/pressure in the brain as a result of stress being stranded and have occurred around the time of death.

Parasites were observed in the stomach but it is common to find parasites in various organs in wild cetaceans. Since this animal was in good body condition it seems unlikely the stomach parasites were doing this animal too much harm. It has been suggested that these nematodes can in fact aid in digestion by invading the softer tissues of prey items. Several squid beaks were found in the stomach of this whale. Squid beaks are very difficult for the whale to completely digest and are often retained in the stomach and then regurgitated after a period of time. There seems to be some debate as to how long squid beaks are retained in the stomach so it is difficult to say how long ago this whale had eaten.

If one of the juvenile calves that were euthanased was the offspring of this adult female, then it is possible the juvenile was lingering not far offshore and perhaps got into trouble in shallower water.

File Nos.:

Students:

Date: Pathologist:

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