NOAA TECHNICAL MEMORANDUM NOS-NCCOS-CCEHBR-0001

CETACEAN NECROPSY REPORTS: VOLUME 1

Wayne E. McFee
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March 1998

U.S. Department of Commerce
National Oceanic and Atmospheric Administration
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ABSTRACT

Necropsy reports have been, and will continue to be, important supplements to histological examinations of tissues to determine the causes of death of animals. Volume 1 contains necropsy reports of stranded marine mammals in South Carolina from 1991 to 1993. Twenty-seven reports were prepared during this period. Histology reports from the Armed Forces Institute of Pathology (AFIP), Washington, D.C., were received for 21 of these animals. Causes of death were suggested by the AFIP through histological examination and gross necropsy findings, for 11 of the 21 animals (52.4%). Preparation of necropsy reports and collection and packaging of tissues by consistent protocols proved to increase the chances of determining the causes of death through histological examination by the AFIP.

TABLE OF CONTENTS

INTRODUCTION

The Southeast United States (SEUS) Marine Mammal Stranding Network is a network of state and federal government personnel, public volunteers, educational institutions, and other private entities, that respond to strandings of marine mammals in the southeastern U.S. The National Marine Fisheries Service (NMFS) Charleston Laboratory, now the National Ocean Service (NOS) is a component of this network, and responds to strandings along the South Carolina coast. The State formally entered into the Southeastern United States (SEUS) marine mammal stranding network in 1990. The NMFS Southeast Fisheries Science Center (SEFSC) had recognized a need to become better prepared to respond to unusual, especially increased, mortalities of marine mammals, and to develop consistent methods of sample and data collection for all strandings. One staff member from the Charleston Laboratory was designated as a NMFS Area Representative to record strandings in South Carolina and Georgia by the NMFS SEFSC in Miami. The roles of the Area Representative were to ensure that all strandings were reported in a timely manner, to ensure that the other network members were trained in sample collection protocols for fresh animals at a minimum, and to improve the amount and quality of scientific information obtained in his/her area. The Area Representative worked closely with the State Stranding Network Coordinators from the South Carolina Department of Natural Resources (SCDNR) and the Georgia Department of Natural Resources (GDNR) to obtain carcasses or samples for examination and to train interested personnel in proper techniques.

In addition to reporting occurrences and morphometric data on marine mammal strandings, necropsies were conducted from 1991 to 1996 on a variety of species that were freshly dead (code 2) and slightly decomposed (code 3) to obtain baseline data on histopathology, life history, contaminant loads, and clinical parameters whenever feasible.

Necropsies were also important in verifying and documenting cases of human interaction. The need for this information had become apparent to determine the causes of death during the 1987-88 bottlenose dolphin die-off along the east coast of the United States (Scott *et al.*, 1988). Because there was no funding to directly support this project, the effort directed at stranding response was irregular, and it was likely that a significant portion of strandings were missed. Also, because of the limited staff time available, not all suitable animals were necropsied, and for some, no necropsy reports were prepared.

Volume 1 contains necropsy reports from 1991, 1992, and 1993 (Appendix 1, Appendix 2, and Appendix 3, respectively). The authors and necropsy team members mentioned in these reports are not pathologists or veterinarians (unless otherwise noted). This should be considered in interpretation of the conclusive statements provided in the reports. These reports are intended to describe the conditions of tissues and collect the appropriate samples so that a trained pathologist could provide a plausible explanation for the death of the animals in question. These reports, combined with the information collected for baseline data as stated above, will provide a better understanding of cetacean disease processes and their relationship with the environment in which they live, as well as contribute valuable information regarding human interaction.

METHODS

The South Carolina Marine Mammal Stranding Network operated from 1991 under the guidelines outlined by the SEUS Marine Mammal Stranding Network (Wilkinson, 1991). The SCDNR and NMFS Charleston Laboratory have taken measures to ensure the recovery of animals after notification of a stranded marine mammal as outlined in Figure 1. While response to strandings is handled on a case-by-case basis, during the period 1991-1993, the SCDNR usually immediately notified the NMFS Charleston Laboratory personnel of a stranding, and

these personnel either brought the animal back to the NMFS Charleston Laboratory for necropsy, or necropsied the animal on site. Occasionally, SCDNR staff provided assistance in carcass retrieval, either delivering the animal to NMFS or transporting the animal to a location where NMFS could later retrieve the animal.

Level A data was recorded on the Cetacean Data Record (CDR) (Figure 2) prior to each necropsy. Some measurements were not collected on animals that were too decomposed or mutilated (eg.-girths and blubber thicknesses), or for other unforeseen circumstances. Each stranded animal was assigned a file folder. CDR's for each measured animal were stored in the individual animal's file folder at the NMFS Charleston Laboratory and in a Paradox© database. Marine Mammal Stranding Report Forms (Figure 3) were sent to the State Coordinator of the Stranding Network and then to the Regional Stranding Network Coordinator at the Hubbs-Sea World Research Institute, Orlando, Florida, USA. GDNR personnel sent the Marine Mammal Stranding Report Forms directly to the Hubbs-Sea World Research Institute. The NMFS Area Representative was responsible for sending the Level A stranding information electronically within 24 hours to the Southeast Fisheries Science Center located in Miami, Florida, USA. Photographs were taken using 35 mm cameras to document the external condition of the stranded animals and any evidence of human interaction.

When possible, necropsies were conducted on every code 2 and code 3 animal according to NMFS Charleston Laboratory protocol (Galloway and Colbert (eds.), 1998). Histology samples were collected in 10% neutral buffered formalin (NBF) and allowed to fix for 24 hours. The formalin was then decanted and replaced with fresh 10% NBF. After two weeks of fixation, the histology samples were each halved. One complete set was sent to the Armed Forces Institute of Pathology (AFIP), Washington, D.C., USA and one complete set was archived at the

NMFS Charleston Laboratory. Formalin samples were packaged and shipped according to NMFS Charleston Laboratory protocol. Toxicology samples (liver, kidney, muscle, brain) were collected using titanium knives and stored in Teflon® bags. In some cases, logistical reasons led to collection of the samples in ziplock polyethylene plastic bags until they could be subsampled for toxicology analysis. These samples were frozen at -80 °C in ultracold freezers at the NMFS Charleston Laboratory.

Life history samples were collected from each animal regardless of condition of the animal. Stomachs were frozen and sent to the Hubbs-Sea World Research Institute, Orlando, Florida, USA for prey analysis. Ovaries and testes were preserved in 10% NBF and analyzed according to protocol by Akin *et al.* (1993). Ectoparasites were collected in 70% ethanol and endoparasites in an alcohol-formalin-acetic acid (AFA) solution (Geraci and Lounsbury, 1993). Parasites were stained and mounted according to protocol established by Dierauf (1990). Four teeth were removed from the lower left jaw (#s 13-16, in most cases), fixed in 10% NBF for at least 48 hours, then rinsed with water and stored in 70% ethanol (Hohn, 1989). Age analysis of the teeth has not yet been performed. Skeletal remains were prepared according to NMFS Charleston Laboratory protocol (McFee, 1996).

Information about each stranded animal was archived in individual file folders marked with the animal's Charleston Reference Number (CRN) and Field Number. Each folder contained a Marine Mammal Stranding Report Form, Cetacean Data Record Form, necropsy report (if prepared), and AFIP report (if received). Photographs were archived in spiral bound notebooks and labeled with species name, date stranded, location of stranding, CRN, and field number. Necropsy reports contained the following information: 1) Level A data, 2) report of the retrieval of the animal, 3) description of external characteristics, 4) gross description of internal

characteristics (eg.- organs, parasites, infection, etc.), 5) conclusions (if possible), and 6) a list of samples collected.

RESULTS and DISCUSSION

This volume contains necropsy reports from 1991 through 1993 in unedited form (Appendices 1-3, respectively). Six stranding reports were prepared in 1991 and included the following species: bottlenose dolphin [*Tursiops truncatus* (Tt); n=4], pygmy sperm whale [*Kogia breviceps* (Kb); n=1], and short-fin pilot whale [*Globicephala macrorhynchus* (Gm); n=1]. Only one bottlenose dolphin necropsy report was prepared in 1992, mainly due to the absence of staff that were responding to a bottlenose dolphin die-off in Texas. Twenty stranding reports were prepared in 1993, and included the following species: bottlenose dolphin (n=13), pygmy sperm whale (n=2), spotted dolphin [*Stenella sp.*(Ssp.); n=3], *Mesoplodon sp.*(Msp.) (n=1), and dwarf sperm whale [*Kogia simus* (Ks); n=1].

Some suggestions for the cause of death or demise of the animal in question were included in the necropsy reports, even though the authors were not trained pathologists or veterinarians. The necropsy reports contained information that, combined with the results of histological findings, could later be used by trained pathologists to determine cause of death. These included the texture, color, state of decomposition, and weight (if possible), of each tissue. Of the 18 bottlenose dolphins for which necropsy reports of gross findings were prepared, suggestions for causes of death included: a) could not be determined (n=10), b) perforative peritonitis (n=2), c) stillbirth (n=2), d) human interaction (n=2), e) severe parasitic pneumonia (n=1), and f) heart disease (n=1).

The immediate cause of death could not be determined for all other species listed above except for the spotted dolphins. These dolphins were incidentally killed in an offshore gillnet

fishery off the coast of North Carolina and subsequently transported to the NMFS Charleston Laboratory to be used in necropsy demonstrations.

Histology reports for 21 (14 Tt; 3 Kb; 1 Ks; 1 Gm; 1 Ssp.; 1 Msp.) animals were received from the AFIP. These reports described the tissues submitted and identified causes of death when possible. Causes of death for 8 bottlenose dolphins (57.1%) were identified in these reports (Table 1). Septicemia was determined to be the cause of death in two of these cases. Although the septicemic isolates were not identified, a few isolates have been found to cause bottlenose dolphin mortality: *Salmonella sp.*, *Hemolytic staphylococcus*, *Erysipelothrix rhusiopathidae* (Howard *et al.*, 1983), *Staphylococcus aureus*, *Clostridium perfringens*, and *Streptococcus spp.* (Dunn, 1990). Histology results showed verminous pneumonia as a causative agent of death in one bottlenose dolphin and two others with unconfirmed causes of death had the condition. This condition has been described as a common finding in stranded marine mammals (Howard *et al.*, 1983; Gage, 1990).

Gross necropsy findings from the four *Kogia* sp. examined suggested congestive heart failure as a possible cause for stranding. This condition is a relatively common finding in pygmy and dwarf sperm whales (Bossart *et al.*, 1985). Histology results confirmed gross findings in two cases, contradicted one, and was not useful to determine cause of death from submitted material in the fourth case. All of the *Kogia* hearts examined appeared to have thin-walled, flabby right ventricles, hypertrophic left ventricles, and a rounded appearance characteristic of cardiomyopathy described in Bossart *et al.* (1985). AFIP histologists reported all of the animals had severe centrilobular hepatic congestion with hepatocellular atrophy consistent with cardiomyopathy. However, Bossart (1991) suggested that one of the hearts did not have the "inflammatory changes as well as lesions consistent with cardiomyopathy...". This condition

warrants further investigation because of the Atlantic Scientific Review Group's (ASRG) (a panel of marine mammal experts) recommendation that *Kogia* species be considered as a strategic stock (Blaylock *et al.*, 1995). A strategic stock is defined as a "marine mammal stock for which the level of direct human induced mortality exceeds the potential biological removal level... is declining and likely to be listed as a threatened species... or is designated as depleted" under the Endangered Species Act of 1973 (Wade and Angliss, 1997).

In the cases of the one *Stenella sp.* and the one *Mesoplodon sp.*, histological examination was not useful due to tissue autolysis. Similarly, tissues submitted for the one pilot whale were not sufficient to provide significant histological findings.

CONCLUSION

The necropsy reports became more descriptive in gross findings and medical terminology as the authors gained necropsy and technical writing experience. The variety of tissues and the manner in which they were collected improved over the years. Increasing the number of tissues sampled, as well as the number of replicate samples of each tissue, resulted in a corresponding increase in the likelihood of the AFIP providing a diagnosis of the cause of death. Examination of very fresh (code 2) animals that had not been previously frozen provided the best opportunity for identification of the cause of death. Freezing of a carcass prior to tissue collection causes cell lysis which precluded accurate histological analysis, in most cases. While some information could be gained from slightly decomposed (code 3) animals, a cause of death determination was less likely.

We found that collecting and packaging tissues by consistent protocols and providing a detailed necropsy report to accompany the tissue samples sent to the AFIP for analysis improved the likelihood of identifying the causes of death from stranded cetaceans. Other analyses were

also conducted on these animals in an effort to maximize baseline information, and to provide larger sample sizes for future statistical analyses. Results of life history analyses (ageing, food habits, reproductive status, contaminant loads, etc.) as well as environmental contaminant analyses are not included in this report but will be provided in future publications.

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The authors would like to thank the South Carolina Department of Natural Resources, the numerous volunteers that comprised the SEUS marine mammal stranding network, and the NMFS Charleston Laboratory necropsy team volunteers for the opportunity to examine carcasses and collect tissues for analysis. We also thank Dr. Tom Lipscomb (AFIP), Dr. Richard Harris (AFIP), and Dr. Linda Johnson (AFIP) for their analyses of submitted tissues and generation of subsequent histology reports; Dr. Sylvia Galloway, for guidance and support of the project; Dr. Joseph Geraci, for necropsy demonstrations; Ms. Debra Wolf and Mr. Greg Mitchum, for their extraordinary assistance in the retrieval and necropsy of stranded animals; Dr. Pat Fair, Mr. Larry Hansen, and Mr. Eric Zolman for review comments; Ms. Marlene Wiggins for technical support.

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Figure 1. Flow diagram of reports of marine mammal strandings in South Carolina.

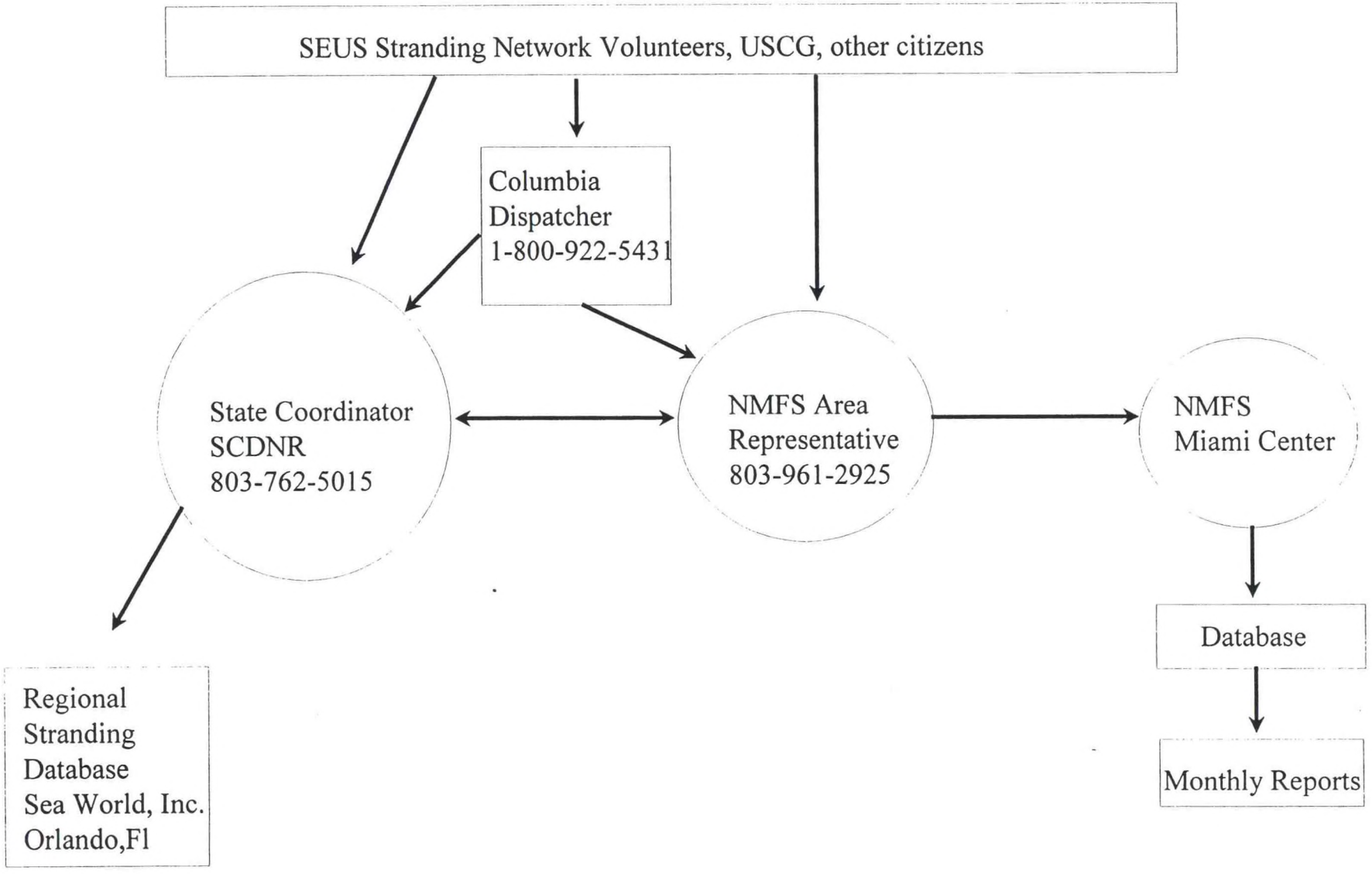

Figure 2. Marine mammal Cetacean Data Record.

CETACEAN DATA RECORD

field no. _____
cat. no. _____

species _____ sex _____ length _____
Date, time stranded or captured _____ date, time of data _____
observer _____ locality _____

EXTERNAL DATA (specify units of measure used _____)

photographs or drawings _____
tooth or baleen counts: left upper _____ right upper _____ l. lower _____ r. lower _____
diameter largest tooth, length longest baleen plate _____ color of baleen _____
ectoparasites _____

number of throat or ventral grooves _____ weight of specimen _____

MEASUREMENTS, BODY (specify units of measure used _____)

2. snout to center of eye..... _____
3. snout to apex of melon..... _____
15. projection of lower jaw..... _____
4. length of gape..... _____
5. snout to ear..... _____
6. center of eye to ear..... _____
7. center of eye to angle of mouth. _____
8. eye to blowhole (center)..... _____
9. snout to center of blowhole(s).. _____
20. length of throat grooves..... _____
10. snout to flipper..... _____
11. snout to tip of dorsal fin..... _____
12. snout to center of umbilicus.... _____
16. snout to end of ventral grooves _____
13. snout to genital slit..... _____
14. snout to anus..... _____
1. total length, snout to notch... _____
17. blubber thickness, mid-dorsal.. _____
18. blubber thickness, mid-lateral. _____
19. blubber thickness, mid-ventral. _____
21. girth at axilla..... _____
21a. girth at eye..... _____
22. maximum girth..... _____
23. girth at anus..... _____
23a. girth ____ cm before notch..... _____

MEASUREMENTS, APERTURES (specify units of measure used _____)

24. eye:.....height _____ length _____
25. length mammary slits: r. _____ l. _____
26. length genital slit ____ anal slit _____
27. blowhole(s): length _____ width _____
28. diameter ear opening: r. ____ l. _____

MEASUREMENTS, APPENDAGES (specify units of measure used)

29. flipper length (anterior..... _____
30. flipper length (posterior)..... _____
31. maximum width of flipper..... _____
32. height of dorsal fin..... _____
33. length of dorsal fin base..... _____
34. width of flukes..... _____
35. length of flukes..... _____
36. depth of fluke notch..... _____

INTERNAL DATA (specify units of measure used _____)

stomach contents (type and quantity) _____
internal parasites (see checklist) _____
vertebral epiphyses: open _____ mm; closed, visible _____ closed, invisible _____
gonads: weight r. _____ l. _____ dimensions (LxWxD) r. _____ l. _____
pregnant? _____ fetus length _____ sex _____ lactating? _____ sperm in epididymus? _____
thickness of mammary gland _____ diameter corpus luteum _____ diameter uterine horn _____

SPECIMEN COLLECTION CHECKLIST

teeth or baleen..... _____
stomach contents..... _____
gonads..... _____
mammary gland..... _____
ear plugs..... _____
bulla..... _____
ectoparasites..... _____
endoparasites..... _____
blubber sample..... _____
muscle sample..... _____
liver sample..... _____
kidney sample..... _____
skull..... _____
skeleton..... _____
fetus..... _____
other..... _____

Remarks _____

Figure 3. Marine Mammal Stranding Report Form.

MARINE MAMMAL STRANDING REPORT

SID=_____ (NMFS USE)

FIELD NO.:_____ NMFS REGISTRATION NO._____

COMMON NAME:_____ GENUS:_____ SPECIES:_____

EXAMINER

Name:_____ Agency:_____ Phone:_____

Address:_____

LOCATION
State:_____ County:_____
City: _____
Locality Details: _____
_____
_____
_____
*Latitude:_____N
*Longitude:_____W

TYPE OF OCCURRENCE
Mass Stranding: (Yes) / (No) # Animals_____
Human Interaction: (Yes) / (No) / (?)
Check one: __1. Boat collision
__2. Shot
__3. Fishery interaction
__4. Other_____
How determined: _____
Other Causes (if known):_____
_____

DATE OF INITIAL OBSERVATION:
Yr _____ Mo _____ Day _____
CONDITION: Check one:__1.Alive
__2.Fresh dead
__3.Moderate decomp.
__4.Advanced decomp.
__5.Mummified
__? Unknown

DATE OF EXAMINATION:
Yr _____ Mo _____ Day _____
CONDITION: Check one:__1.Alive
__2.Fresh dead
__3.Moderate decomp.
__4.Advanced decomp.
__5.Mummified
__? Unknown

LIVE ANIMAL - Condition and Disposition:
Check one or more: __1.Released at site
__2.Sick
__3.Injured
__4.Died
__5.Euthanized
__6.Rehabilitated and released
__? Unknown
Transported to: _____
(Died) / (Released) Date:_____

TAGS APPLIED?: (Yes) / (No)
TAGS PRESENT?: (Yes) / (No)

	Dorsal	Left	Right
Tag No.(s):	_____	_____	_____
Color(s):	_____	_____	_____
Type:	_____	_____	_____
Placement		Front/Rear	Front/Rear

CARCASS - Disposition, check one:
Check one: __1.Left at site
__2.Buried
__3.Towed
__4.Sci. collection (see below)
__5.Edu. collection (see below)
__6.Other _____
_____
__? Unknown
NECROPSIED? (Yes) / (No)

MORPHOLOGICAL DATA:
Sex - Check one: __1.Male
__2.Female
__? Unknown
Straight Length:_____(cm)/(in)/(est)
*Weight:_____(kg)/(lb)/(est)
PHOTOS TAKEN? (Yes) / (No)

REMARKS: _____

DISPOSITION OF TISSUE/SKELETAL MATERIAL: _____

*Record data if available

It is estimated that completion of this form requires 20 minutes.

OMB#0648-0178, expires 01/31/94 ☆1992-630-633

Table 1. Cause of death and significant remarks reported in Armed Forces Institute of Pathology Consultation Reports for histology samples from marine mammals necropsied by the SEUS marine mammal stranding network, 1991-1993. (Tt=bottlenose dolphin; Kb=pygmy sperm whale; Ks=dwarf sperm whale; Gm=short-finned pilot whale; Ssp.=spotted dolphin species; Msp.=beaked whale species)

Charl. Ref. No.	Date	Sp.	Cause of Death	Other Findings
MM1-21	5/22/91	Tt	stillborn	atelectasis
MM1-28	7/24/91	Tt	chronic peritonitis	none
MM1-29	8/1/91	Tt	stillborn	none
MM2-10	11/23/92	Tt	unknown	meningitis
MM2-19	2/14/93	Tt	septicemic secondary to pulmonary abscess	focal hepatitis
MM2-33	4/22/93	Tt	unknown	verminous pneumonia
MM2-35	4/29/93	Tt	unknown	verminous pneumonia
MM2-37	5/11/93	Tt	unknown	dermatitis
MM2-38	5/15/93	Tt	drowning	none
MM2-43	6/21/93	Tt	verminous pneumonia	intranuclear inclusion bodies within epidermal cells
MMES9301SC	7/8/93	Tt	ventricular puncture from foreign object	none
MMES9310SC	7/31/93	Tt	unknown	none
MMES9330SC	11/10/93	Tt	unknown	emaciated
MMES9331SC	11/16/93	Tt	peracute gram-neg. septicemia and pneumonia	acute ulcerative cystitis
MM1-6	1/21/91	Kb	unknown	severe hepatic congestion
MMES9336SC	11/29/93	Kb	cardiomyopathy	none
MMES9338SC	12/6/93	Kb	cardiomyopathy	severe centrilobular hepatic congestion
MM2-20	2/28/93	Ks	unknown	none
MM1-72(A)	6/24/93	Ssp	drowning	caught in gillnet
MM1-15	4/16/91	Gm	unknown	none
MM2-22	3/10/93	Msp	unknown	gastritis

APPENDIX 1

1991 Necropsy Reports

CHARLESTON LABORATORY
FORENSICS PROJECT
NECROPSY NOTES

DATE: January 22, 1991

SPECIES and SEX: Pygmy Sperm Whale, *Kogia Breviceps*
Female

LOCATION and DATE of STRANDING: Hilton Head, SC, 1/21/91.

SEUS STRANDING NETWORK INFORMATION: See attached stranding report.

LOCATION of NECROPSY: NMFS, SEFC
Charleston Laboratory

NECROPSY NOTES

1. EXTERNAL OBSERVATIONS:

Numerous photographs were taken by the SC-SEUSSN (Tom Murphy) to capture the external appearance of the animal. The animal seemed to be in excellent physical condition as judged by its external appearance. There were numerous abrasions on the belly region which were caused by the rocking in the sand on the beach. The skin otherwise had an unmarked appearance, being dark slate gray to black in color. There were no nicks, cuts, abrasions, lesions, scars or the like on the skin, tail flukes, flippers, dorsal fin or the head. All the appendages were smooth along their edges. The appearance of the false gill marking at rear of the head, the tooth count, and the dorsal fin shape and size confirmed the identification of the species.

The eyes were deeply embedded under what appeared to be very swollen lids; this condition may have been caused by the long stay on the beach in bright sunshine prior to euthanasia. The genital slit was very swollen and milk exuded from the mammary slits when expressed. The milk was very much like Elmer's glue in consistency and appearance. The urogenital slit and the anal slit were clear of any foreign objects; the blow hole was free and clear; the mouth appeared normal. The teeth in the lower jaw were long, thin and ivory in appearance; there were 14 teeth in the lower right jaw and 15 in the lower left jaw.

The veterinarian (Dr. Watt) that accompanied the stranding network team had some difficulty in putting the animal down, finding it difficult to determine where the location of the heart. It took 20 minutes from the time of injection to time of death. Sally Murphy used a long metal pin to attempt to mimic injection into the heart; photographs were taken showing the location selected for external entry. The site chosen was slightly forward (1/2") of the rear attachment point of the right flipper and up towards the backbone by 2-3" to a line drawn back from the eye socket. After necropsy revealed the location of the heart relative to the inserted pin, it appeared that the entry point should be just above the rear most point of attachment of the flipper, and should progress on an angle toward the center of the sternum.

2. INTERNAL OBSERVATIONS:

The animal appeared to have a healthy layer of blubber as well as a very good muscle mass. There were no parasites obvious on the outside of any of the major organs. There was material in the intestinal tract suggesting recent feeding. The head was saved intact (except for a 1"x4"section of melon collected for lipid analysis) for shipment to the Smithsonian.

The stomach was tied off at the esophagus and at entry into the small intestine and set aside without looking internally for parasites. It was shaped like a boot with what appeared to be two blind-sacs at the toe and heel, with a third bulbous lobe preceding the exit to the small intestine. The small intestine appeared to be very constricted at the site of connection with the stomach. What appeared to be the gall bladder, or maybe the bile duct, was tied off at either end. A small fluidy mass (approx 1 1/2" diam) was removed from the surface of the large intestine and preserved for histopath. The small intestine felt firmly packed with contents, while the large intestine was filled with dark redbrown fluid. There were no apparent foreign objects in the esophagus as felt from the cut end leading to the stomach.

The liver was large, multi-lobed and appeared to be in normal condition. It was located from about 1/6 of the way back to almost 2/3 of the way back in the body cavity, close to the outer body wall (ventral). It had a blue hue as did many of the major blood vessels in the organs.

The diaphragm appeared to be well structured with a muscle layer of approx 3/4". The lungs (appeared to be four lobes) were all inflated but the one that the veterinarian suspected was punctured during the euthanasia procedure. They looked pinky gray and deflated under mild pressure of the hand. The partially deflated lung looked like a painted surface when it krinkles into an alligator skin effect; when the lung is totally deflated it appears like a limp wet 'old ladies stocking'.

The kidneys appeared to be normal, containing many knobby bumps and two major lobes; they were well covered with connective tissue, lying close to the backbone on either side about 2/3 of the way back in the body cavity. At the top of each kidney was a small tissue mass, which was removed from one kidney and stored separately as adrenal tissue.

The heart was located deep in the front of the body cavity nearest the head area and close to the sternum; it was essentially located directly under the flipper. The heart appeared to be four chambered with a major and minor ventricle and two relatively equal atria; the latter two chambers were soft and lay flat on the top of the heart. One of the ventricles consisted of firm, thick muscle while the other was much thinner and flabbier. The heart appeared to be free of internal parasites and looked normal from the aspect of color and shape. It was 21 cm high and 19 cm wide, and weighed 3.5 lb.

The uterus was enlarged and when layed out had a radial fan-like pattern of vasculature, blue in color over the background of offwhite (photograph taken). The uterus was full of fluid and had a small fetus floating freely within. There were two lumps of tissue near the head end of the uterus that were approx. 2" in diameter; one of the tissue masses had an additional mass that was ball shaped and very vascular on the surface. It was presumed that these were the ovaries and that the one extra mass was the developed corpus luteum. When the uterus was slit open a thin membrane extruded through the slit and was presumed to be the amnionic sac; once cut the clear fluid contained within dissipated.

The fetus was well developed, approx. 20 cm in total length and weighed 162 g, pale white to translucent, looking like a miniature version of the adult whale (photograph taken). It had a distinct umbilical attachment of approx. 1 cm in diameter.

3. SAMPLE DISPERSMENT:

- Blood - a blood sample was collected from the tail fluke from the live animal, the sample was stored at refrigerator temperature until the blood cells were spun down, then the sample was frozen; analysis will be conducted by Roche Biomedical via a request from a local veternarian (Dr. Jean McKee).

- Head - including the lower jaw, the blow hole and the regions containing the false gill slit glands, was frozen and will be shipped to the Smithsonian (Charlie Potter); samples were thus not taken from the brain, nor were the ears or nasal cavaties checked for parasites. A sample of the melon was removed for lipid analysis at Charleston Laboratory.

- Uterus - was drained and the fetus removed; the remainder was frozen and will be shipped to the Smithsonian (Charlie Potter).

- Fetus - was infused with buffered formalin via the major blood vessals of the umbilical cord and will be retained at the Charleston Laboratory.

- Samples of milk, blubber, and melon were frozen and will be retained at Charleston Laboratory for lipid analysis.

- Samples of kidney, liver, and blubber were removed for organics and metals analysis using appropriate tools and care for each set of samples; the samples will be retained frozen in the Charleston Laboratory.

- Samples of kidney, liver, lung, and a soft mass collected from the intestinal wall were placed in buffered formalin and sent to AFIP (Tom Lipscomb); the mass was collected in its entirety along with a small perimeter of intestinal tissue; the mass was cut open prior to placement in formalin, a small white mass was removed; the latter appeared to be some type of flat worm, although no distinct head could be found.

- Heart and stomach - each of these organs was collected for SEUS (Dan Odell); the stomach was tied off at either end and frozen without further treatment, thus it was not checked for parasites; the heart was removed whole and the ventricles were cut open prior to soaking in buffered in formalin.

- A sample of muscle was frozen for future IEF analysis at the Charleston Laboratory.

DEPARTMENT OF DEFENSE
ARMED FORCES INSTITUTE OF PATHOLOGY
WASHINGTON, DC 20306-6000

REPLY TO ATTENTION OF

PATIENT IDENTIFICATION		PLEASE USE AFIP ACCESSION NUMBER IN ALL CORRESPONDENCE
AFIP ACCESSION NUMBER	CHECK DIGIT	SEQUENCE
2316781-0	1	00
NAME		SSAN
ANIMAL, CETACEA WHALE A-000-91 T		
SURGICAL/AUTOPSY PATH ACCESSION #'S		
PLEASE INFORM US OF ANY PATIENT IDENTIFICATION ERRORS		

CPU-V
JMP/TPL/KJD/mab

Dr. Ann C. Jennings
Southeast Fisheries Science Center
Charleston Laboratory, P.O. Box 12607
Charleston, SC 29412-0607

DATE: 16 April 1991

CONSULTATION REPORT ON CONTRIBUTOR MATERIAL

AFIP DIAGNOSIS: A-000-91 1. Liver: Congestion, diffuse, severe, with centrolobular hepatocellular loss, midzonal hepatocellular atrophy and sublobular and capsular edema, pygmy sperm whale (Kogia breviceps), cetacean.
2. Liver, periportal hepatocytes: Lipidosis, diffuse, mild.
3. Colon, tunica muscularis: Granuloma, eosinophilic, focally extensive, moderate, with central cavitation and intralesional cestode larva.
4. Colon and kidney: Congestion, multifocal, mild.
5. Adipose tissue: Fibrous tags, multifocal, mild.

Comment: The severe hepatic congestion was probably the result of impaired venous drainage of the liver; right-sided cardiac insufficiency is a possible cause. Similar hepatic lesions have been reported in stranded pygmy and dwarf sperm whales with cardiomyopathy. Unfortunately, heart was not submitted. Your necropsy report indicates that one of the ventricles was thin-walled and flabby; if this was the right ventricle, then the possibility that the whale stranded because of cardiomyopathy is supported. The renal and colonic congestion may be agonal or secondary to cardiovascular lesions. The periportal hepatic lipidosis could be secondary to hypoxia from the hepatic vascular stasis, or it may have been caused by mobilization of fat stores due to starvation. The encysted parasite in the wall of the colon was found to be a cestode larva. The submitted tissue labelled as lung was found to be adipose tissue; several fibrous tags were present on its surface. The cited reference may be of interest to you. Thank you for submitting this interesting case to the Registry of Veterinary Pathology.

Reference: Bossart, G.D., et. al.: Cardiomyopathy in stranded pygmy and dwarf sperm whales. Journal of the American Veterinary Medical Association, Vol 187, No. 11, pp 1137-1140.

JOHN M. PLETCHER, DVM, MPH
Colonel, VC, USA
Chairman, Department of Veterinary Pathology

THOMAS P. LIPSCOMB, DVM
MAJ, VC, USA
Department of Veterinary Pathology

VETERINARY REFERENCE LABORATORIES INC

Contact: Ann Jennings
NMFS
Charleston Lab-
P.O. Box 12607
Charleston SC
29422
803-762-1200

OWNER: S.E. N.M.F.S.
SPECIES: Kogia breviceps

ANIMAL ID: CHARLESTON REF.#1-6
SEX: Female

DIAGNOSIS:

Heart, Hemorrhage, Multifocal, Mild

COMMENTS:

Multiple sections of heart are examined microscopically from a stranded pygmy sperm whale.

The heart is characterized by mild, multifocal interstitial hemorrhage. The conduction system and coronary blood vessels are unremarkable.

The hemorrhage present is a non-specific change often associated with terminal shock. Inflammatory changes as well as lesions consistent with cardiomyopathy previously described in this species are not present.

Gregory D. Bossart, V.M.D.
Pathologist
8/30/91

CHARLESTON LABORATORY
FORENSICS PROJECT
NECROPSY NOTES

DATE: March 23, 1991

SPECIES AND SEX: Bottlenose Dolphin, *Tursiops truncatus*
Female

ORIGINAL ID #: GA 305

LOCATION and DATE OF STRANDINGS: Galveston, Texas, 2-16-90

SEUS STRANDING NETWORK INFORMATION: See attached report.

LOCATION OF NECROPSY: NMFS, Southeast Fisheries Science Center
Charleston Laboratory

NECROPSY NOTES

1. GENERAL COMMENTS:

The necropsy was performed by Dr. Joseph Geraci, Department of Pathology, Univ. of Guelph, Ontario. Dr. Sylvia Galloway and Ms. Ann Jennings assisted. Ms. Pat Fair collected samples and Dr. Cheryl Woodley-Miller took notes.

The specimen (a Texas stranding) was shipped from Texas A&M University to the NMFS lab for use in necropsy training for SC veterinarians who are designated strandings response team members. The animal stranded on 2-16-90 and was frozen at Texas A&M University until necropsied at the NMFS Laboratory in Charleston on 3-23-91.

2. EXTERNAL OBSERVATIONS:

The dolphin was a mature female, approximately 8-12 years of age. It was estimated to weigh 260-280 lbs which was probably 100 lbs light for its size and age. An initial interpretation was that the animal was very thin and had probably been sick for 2-3 weeks. There were several gashes across the head, and some little round spots indicating a mild pox virus infection. The eyes were sunken and the skin very dry. The skin was dark grey to black in color. The blowhole, mouth, and genital slit were free and clear.

3. INTERNAL OBSERVATIONS:

The blubber was estimated to be half as thick as it should have been and no fat pad was visible. There was fluid in the muscle tissue. The edema was attributed to shock, not trauma. There was more edema around and under the mouth. Oil oozed from the mammary gland. The lung tissue was lumpy and scarred, probably due to infection. The outer tissue of the lung was purplish in color, and the interior tissue was dark reddish-brown. The lymph vessel draining the lung to the nodes at the base of each lobe were highly visible.

The internal lining of the abdominal cavity was very green. Fluid and bile were in the abdomen. The cavity and organs were massively adhered, and scar tissue was binding organs together. The intestinal tract was grown together making it impossible to run the intestine for ulcers, parasites, etc. There had apparently been episodes of bile and fluids leaking into the cavity. The infection must have gone beyond liver involvement. The scars and adhesions were both recent and several years old, so the animal must have been sick for a very long time. The knobby liver indicated that numerous attempts to regenerate the tissue occurred. Recent fibrin growth was present in several areas. The urinary bladder was thickened. The contents had left the wall stained a dark yellow-orange. There had apparently been a long-term infection. The vessels of the bladder were large and inflamed indicating cystitis. The kidney appeared normal except for the bile coloration. Geraci made the comment that these kinds of changes are not usually due to viral infection, but to toxicity because of numerous insults and attempts to repair. There were not many ovarian scars: age estimated at 9-12 years. The heart appeared somewhat abnormal. The vessels were very thick and were crowded by very dense connective tissue. The green color of the lymph nodes indicated that bile was free in the circulation. The spleen was also green indicating bile penetration.

A grapefruit-size chunk of green ice was removed from the stomach for sodium analysis. Geraci suspected that it was sea water and that the animal had made a final attempt to ward off dehydration by drinking sea water. A somewhat corroded, relaxed s-shaped metal wire was found penetrating the first and second chambers of the stomach. A huge mass of scar tissue had formed. The penetration of the metal wire had penetrated the stomach wall. Fibrin tags which were a few days old were present. The animal probably died from the peritonitis. The pancreas appeared normal. Remains of fish flesh and small bones were present in the stomach indicating a feeding prior to death. No signs of other types of food, such as squid beaks, were present. There was a very light infection of *Braunina codiformis* parasites in the first and second chamber of the stomach.

No parasites were found in the middle ear or sinuses. The brain was in good condition and was removed. The skull was retained for future brain location reference. The lower jaw was removed for life history analysis.

4. CONCLUSIONS:

The lesion in the stomach caused by the metal wire was significant; the wire most likely pierced the stomach lining and other parts of the digestive tract. Bile and other fluids became free in the body cavity and in the circulation. A heart problem was evident. There was a urinary bladder infection. Such severe adhesions of the organs to each other and to the cavity wall indicated repeated bouts of peritonitis. Bacterial infections probably resulted. The animal had suffered from failure of the liver, spleen, and lymphatic systems.

5. SAMPLES RETAINED:

Chas Ref #	Sample type
1-13(A)	section of right lobe of cerebrum in formalin
1-13(B)	section of left lobe of cerebrum in formalin
1-13(C)	section of cerebellum in formalin
1-13(D)	section of liver in formalin
1-13(E)	2 parasites Braunina codiformis in formalin
1-13(F)	metal wire removed from stomach
1-13(G)1	heart in formalin
1-13(G)2	heart tissue for DNA work (Chao)
1-13(H)	kidney in formalin
1-13(I)1	kidney in teflon bag: 60.39 g
1-13(I)2	kidney in teflon bag: 149.35 g
1-13(I)3	kidney tissue for DNA work (Chao)
1-13(J)	ovaries, frozen in plastic: 268.3 g
1-13(K)1	section of bladder in formalin
1-13(K)2	bladder frozen in plastic
1-13(L)1	section of adrenal gland in formalin
1-13(L)2	adrenal gland frozen in plastic
1-13(M)1	section of spleen in formalin
1-13(M)2	spleen frozen in plastic
1-13(N)	chunk of ice from stomach for sodium analysis
1-13(O)	melon for lipid analysis
1-13(P)1	section of lung in formalin
1-13(P)2	lung in teflon bag: 104.5 g
1-13(P)3	lung in teflon bag: 103.0 g
1-13(P)4	lung in plastic bag: 153.95 g
1-13(P)5	lung samples for DNA work (Chao)
1-13(Q)1	muscle tissue for lipid analysis
1-13(Q)2	muscle tissue for IEF (Chas Ref # 18-91)
1-13(Q)3	muscle tissue for DNA work (Chao)
1-13(R)1	blubber in teflon:
1-13(R)2	blubber in teflon:
1-13(R)3	blubber in teflon
1-13(R)4	blubber
1-13(R)5	blubber in teflon
1-13(S)1	brain, frozen in plastic bag
1-13(S)2	brain sections for Mike Fulton (acetylcholinesterase analysis)
1-13(T)1	skull
1-13(T)2	lower jaw with teeth

CHARLESTON LABORATORY
FORENSICS PROJECT
NECROPSY NOTES

DATE: April 16, 1991

SPECIES AND SEX: Pilot whale, *Globicephala macrorhyncus*
Female

LOCATION and DATE OF STRANDINGS: Myrtle Beach, SC 4-16-90

SEUS STRANDING NETWORK INFORMATION: #SC-91-6. See attached report.

LOCATION OF NECROPSY: SCWMRD - Georgetown Office
(NMFS, SEFSC, Charleston Laboratory
sub-sampled and examined major organs)

NECROPSY NOTES

1. GENERAL COMMENTS:

The necropsy was conducted by Mrs. Sally Murphy and Mr. Dean Cain, both of the SC Wildlife and Marine Resources Department. The pilot whale carcass was transported from the stranding site to the Georgetown office of SCWMRD for necropsy and sample collection. Dr. Sylvia Galloway and Mrs. Ann Jennings examined and sub-sampled the organs that were collected for analyses, archival, and distribution to other analytical facilities.

2. EXTERNAL OBSERVATIONS:

The specimen, a female approximately 13 ft. in length, was dark gray to black in color. No abrasions, lesions, or scars were present on the exterior surface of the animal. The exterior openings were free and clear except for sand in the mouth of the animal which is attributed to the rolling action in the surf. The teeth were yellowed and worn.

3. INTERNAL OBSERVATIONS:

In the field

The whale was first checked for parasites in the sinuses. No parasites were detected in the sinuses. The connective tissue was very fibrous and difficult to cut. Straw-colored fluid filled the lung cavity. The lungs were still inflated, pinkish-white in color, and appeared healthy. The kidneys were knobby and purplish in color, no visible abnormalities. The heart was neither examined nor sampled. The stomach and liver, as well as the reproductive tract and urinary bladder were removed en mass for laboratory examination and sub-sampling. The female was not lactating. See level A data sheets for measurements.

In the laboratory

The liver was purplish red in color. Grey nodules ranging in size from 1mm to 1cm were abundant on the liver surface. The vessels inside the liver were quite large. The stomach was tied-off and placed in a doubled plastic bag. When examined, the stomach was found to be empty of solid materials and was filled with a green, brown, yellow fluid. Sand was present in the stomach. The reproductive tract had several cysts approximately 2-3 cm in diameter. Upon examination, the cysts were found to contain a white fluidy mass attached to one wall of the cyst. The parasites were placed in formalin for future identification. The vagina appeared to contain an infection. Whitish-yellow thickened fluid (paste-like) was present against the vaginal wall. The urinary bladder was examined. Urine was drawn for analysis. See results on file for blood and urine analyses.

4. CONCLUSIONS:

The older female whale had not eaten for at least 24 hours. The liver was probably not functioning normally. The straw-colored fluid in the body cavity indicated shock. Since the heart, brain, and intestinal tract, lungs, adrenal glands, and lymph nodes were not thoroughly examined, further conclusions will not be drawn.

5. SAMPLES RETAINED:

Chas Ref #	Sample type
1-15(A)	muscle tissue for IEF analyses (CRN 18-95)
1-15(B)	section of liver in formalin
1-15(C)	section of blubber in teflon 186.3 g
1-15(D)	section of blubber in teflon 193.3 g
1-15(E)	lower jaw
1-15(F)	stomach, tied-off and frozen
1-15(G)	reproductive tract, frozen
1-15(H)	muscle tissue for DNA work (Chao)

1-15(J)	liver in teflon bag: 112.68 g
1-15(K)	liver in teflon bag: 279.65 g
1-15(L)	liver in teflon bag: 140.32 g
1-15(M)	blood samples: SST, EDTA, Plain
1-15(N)	section of liver w/ nodules in formalin
1-15(O)	section of infected vagina in formalin
1-15(P)	cysts removed from repro tract in formalin
1-15(Q)	section of bladder in formalin
1-15(R)	urine sample for analysis
1-15(S)	liver in plastic

DEPARTMENT OF DEFENSE
ARMED FORCES INSTITUTE OF PATHOLOGY
WASHINGTON, DC 20306-6000

REPLY TO ATTENTION OF

PATIENT IDENTIFICATION		PLEASE USE AFIP ACCESSION NUMBER IN ALL CORRESPONDENCE
AFIP ACCESSION NUMBER: 2339681-5	CHECK DIGIT:	SEQUENCE: 00
NAME: ANIMAL, CETACEA WHALE 1-15 T	SSAN:	
SURGICAL/AUTOPSY PATH ACCESSION #'S		
PLEASE INFORM US OF ANY PATIENT IDENTIFICATION ERRORS		

CPU-V
JMP/RBM/GMZ/mab

Dr. Ann Jennings
National Marine Fisheries Service
217 Ft. Johnson Road
Charleston, SC 29412

DATE: 23 December 1991

CONSULTATION REPORT ON CONTRIBUTOR MATERIAL

AFIP DIAGNOSIS: 1-15 1. Liver: Fibrosis, periductal, portal and capsular, diffuse, severe, with biliary hyperplasia and mild lymphocytic inflammation, pilot whale (Globicephala macrorhyncus), cetacean.
2. Vagina: Vaginitis, subacute, multifocal, mild, with glandular ectasia.

Comment: The cause of death in this case could not be determined from the specimens submitted for histopathologic evaluation. The portal fibrosis and biliary hyperplasia are most likely due to a biliary fluke infection, however, parasites were not seen histologically. Although numerous gram-positive bacilli were present within the vagina, they are not associated with the inflammation and most likely represent postmortem overgrowth. Many of the vaginal glands were hypertrophied and ectatic. These changes are most likely the result of estrus.

JOHN M. PLETCHER, DVM, MPH
Colonel, VC, USA
Chairman, Department of Veterinary Pathology

ROBERT B. MOELLER, DVM
LTC, VC, USA
Department of Veterinary Pathology

CHARLESTON LABORATORY
FORENSICS PROJECT
NECROPSY NOTES

DATE:	June 6, 1991
SPECIES AND SEX:	Bottlenose Dolphin, *Tursiops truncatus* Female, juvenile
ORIGINAL ID #:	SC-91-9

LOCATION and DATE OF STRANDINGS: Beaufort County, SC 5-22-91

SEUS STRANDING NETWORK INFORMATION: See attached report.

LOCATION OF NECROPSY:	NMFS, Southeast Fisheries Science Center Charleston Laboratory, Marine Forensics Lab

NECROPSY NOTES

1. GENERAL COMMENTS:

The necropsy was conducted by Ms. Ann Jennings with the intention of a full sample collection. Though the specimen was reported to be fairly fresh, it was found to be somewhat "soupy" inside.

The dead newborn was sighted on 5-22-91 while being pushed around by an adult. Behavioral observations were made, and the specimen was retrieved. The specimen was brought to the NMFS lab by Sally Murphy, state coordinator, for gross necropsy and sample collection. It was frozen at the NMFS Laboratory in Charleston on 5-23-91, and necropsied on 6-6-91.

2. EXTERNAL OBSERVATIONS:

The dolphin was a newborn female, weighing 18.5 lbs. At least 50%-60% of the skin was peeling off. No external parasites were visible. The eyes were only slits and were barely open. Teeth were not yet cut. The tongue was green and ulcerated. The blowhole, mouth, and genital slit were free and clear.

3. INTERNAL OBSERVATIONS:

The blubber was greenish in color and no fat pad was visible. The ribs were very small and easily cut or broken. Two small possible parastites were removed from the muscle layer.

The body cavity was somewhat soupy from decomposition, and millions of tiny air bubbles on all identifiable organ surfaces confirmed the state. The outer tissue of the lung was purplish-brown in color, and the interior tissue was dark reddish-brown. The lungs appeared to be airless.

The liver was a brown, soupy blob with no distinguishing characteristics.

The heart was the size of a large plum and was firm enough to be removed for formalin preservation.

The kidneys appeared normal in form, but were somewhat decomposed, as were the adrenal glands. No parasites were found in the body cavity.

The stomach was removed and frozen, but was not examined. The intestinal tract contained a thick, pasty, brown fluid and no solid matter was present. No parasites were found in the intestinal tract. The anal passage was free and clear.

No parasites were found in the middle ear or sinuses. The brain was not examined. The skull and remaining carcass were retained for future articulation.

Due to the advanced internal decomposition, standard collection procedures for metals and contaminants analyses were not followed.

4. CONCLUSIONS:

The existence of an airless lung was indicative of still-birth, with a first breath never occurring. The internal organs appeared morphologically normal. Cause of death was not found.

5. SAMPLES RETAINED:

Chas Ref #	Sample type
1-21	carcass for articulation
1-21(A)	section of left lung in formalin
1-21(B)	section of right lung in formalin
1-21(C)	section of kidney in formalin
1-21(D)	whole heart in formalin
1-21(E)	2 possible parasites in formalin
1-21(F)	kidney frozen
1-21(G)	blubber frozen in plastic
1-21(H)	left lung frozen in plastic
1-21(I)	melon fozen in plastic
1-21(J)	whole stomach frozen
1-21(K)	liver frozen in plastic
1-21(L)	adrenal gland frozen in plastic

DEPARTMENT OF DEFENSE
ARMED FORCES INSTITUTE OF PATHOLOGY
WASHINGTON, DC 20306-6000

REPLY TO ATTENTION OF

PATIENT IDENTIFICATION		PLEASE USE AFIP ACCESSION NUMBER IN ALL CORRESPONDENCE
AFIP ACCESSION NUMBER: 2339683-1	CHECK DIGIT:	SEQUENCE: 00
NAME: ANIMAL, CETACEA DOLPHIN 1-21 T	SSAN:	
SURGICAL/AUTOPSY PATH ACCESSION #'S		
PLEASE INFORM US OF ANY PATIENT IDENTIFICATION ERRORS		

CPU-V
JMP/RBM/JHE/mab

Dr. Ann Jennings
National Marine Fisheries Service
217 Ft. Johnson Road
Charleston, SC 29412

DATE: 18 December 1991

CONSULTATION REPORT ON CONTRIBUTOR MATERIAL

AFIP DIAGNOSIS: 1-21 Lung; kidney; heart: Essentially normal tissue, Atlantic bottlenose dolphin (Tursiops truncatus), cetacean.

Comment: Extensive postmortem autolysis and bacterial overgrowth precluded definitive histopathologic examination of the submitted tissues. The lungs were collapsed with numerous fetal squamous epithelial cells present in alveolar spaces. This finding, along with your gross finding of atelectasis, suggests that the animal may have been stillborn. Thank you for submitting this interesting case to the Registry of Veterinary Pathology.

JOHN M. PLETCHER, DVM, MPH
Colonel, VC, USA
Chairman, Department of Veterinary Pathology

ROBERT B. MOELLER, DVM
LTC, VC, USA
Department of Veterinary Pathology

CHARLESTON LABORATORY
FORENSICS PROJECT
NECROPSY NOTES

DATE: 7-24-91

SPECIES AND SEX: *Tursiops truncatus* - male

LOCATION AND DATE OF STRANDING: Sea Pines Beach, Beaufort County, SC 7-24-91

SEUS STRANDING NETWORK INFORMATION: SC-91-11

LOCATION OF NECROPSY: NMFS, SEFSC, Charleston Laboratory

NECROPSY NOTES

1. GENERAL COMMENTS:

The 260 cm male bottlenose dolphin stranded dead on Sea Pines Beach in Beaufort County on 7-24-91. The specimen was a code 2 at the time of discovery, but deteriorated rapidly in the 95° heat during transport to the NMFS Lab. It was a late code three by the time the necropsy was conducted. The necropsy was conducted by Mrs. Ann Jennings and Mr. Tom Murphy (SCWMRD).

2. EXTERNAL OBSERVATIONS:

The flukes and dorsal fin were missing and there were large shark bites between the blowhole and dorsal fin, on the ventral surface near the flippers, and around the genital opening. The skin had begun to slough off in places from exposure to the sun. One of the shark bites penetrated blubber and muscle layers exposing entrails. No external parasites were visible. The penis was distended. The teeth were very yellowed, worn down to a flat plane where the hollow centers were exposed. Some teeth were missing. The tongue, mouth, and eyes were not examined due to poor condition.

3. INTERNAL OBSERVATIONS:

The blubber layer appeared to be abnormally thin, considering the size of the animal. The musculature was dark red and appeared normal. There was a slight green color to the body cavity lining and exterior surfaces of most organs. A scar approximately 3 cm in length was found on the right liver surface. The liver appeared otherwise normal. Nodules were removed from the body cavity adjacent to the lung. These are suspected to be lymph nodes. The lungs were a light pinkish-beige color, extremely firm to the touch, and were severely adhered to the body cavity wall.

The stomach appeared to be extremely large and very solid. Thought to be full of food, it was removed for examination. The solidity was due to large masses of scar tissue. The increased size was due to the complete adhesion of the left lobe of liver to the three stomachs. There was no division at all between the outer stomach wall and the liver; the three stomachs and the lobe of liver appeared to be one large organ due to an envelope of scar tissue. The first two stomachs were devoid of food matter and the stomach lining was peeling in the first stomach. Sand was present in the second stomach, and there were some tiny finger-like projections on the stomach lining (they appeared to be extensions of the stomach lining tissue instead of parasitic attachments). A yellowish-orange fluid was in the third stomach. Approximately 3 cm into the esophagus from the first stomach chamber, a sharp barbed spine had penetrated the stomach wall. The scar on the liver surface was adjacent to the area of penetration, and the body cavity around the area was greenish in color.

The kidneys were beginning to decompose. The heart surface was somewhat lumpy, and was slightly abnormal in color. The lower jaw had been collected for life history examination and the remainder of the head was in too bad a condition to examine further. There was a large penetrating shark bite near the genital opening and the gonads could not be located.

4. CONCLUSIONS:

The sharp spine removed from the stomach lining was identified as a sea catfish spine by fisheries biologist John DeVane (NMFS). It had probably penetrated not only the stomach wall, but the nearby liver as well. Bile released into the body cavity resulted in the green discoloration of the lining and organs. Perforative peritonitis was indicated by the extensive adhesions and the penetration of the digestive tract by the barbed spine. The toxin from the catfish spine may have added to the damage which produced the massive scars found around the stomachs. The animal had not fed prior to death, and had probably been sick for some time as indicated by the thin blubber layer, lack of food in the stomach chambers, extensive adhesions, and massive scars. The poor condition of the animal could have slowed it down enough to allow sharks to attack, resulting in death, or the bites may have been post-mortem. We could not determine whether the missing tail flukes and dorsal fin were shark wounds or whether that damage could have been the result of human interaction which would have lead to death.

5. SAMPLES RETAINED:

Chas Ref #	Sample type
1-28(A)	lower jaw
1-28(B)	abnormal stomach tissue in formalin
1-28(C)	nodules removed from body cavity (lymph nodes?) in formalin
1-28(D)	catfish dorsal spine removed from stomach wall
1-28(E)	abnormal lung tissue in formalin
1-28(F)	liver tissue with scar in formalin

DEPARTMENT OF DEFENSE
ARMED FORCES INSTITUTE OF PATHOLOGY
WASHINGTON, DC 20306-6000

REPLY TO ATTENTION OF

PATIENT IDENTIFICATION		PLEASE USE AFIP ACCESSION NUMBER IN ALL CORRESPONDENCE
AFIP ACCESSION NUMBER	CHECK DIGIT	SEQUENCE
2339685-6		00
NAME		SSAN
ANIMAL, CETACEA DOLPHIN 1-28 T		
SURGICAL/AUTOPSY PATH ACCESSION #'S		
PLEASE INFORM US OF ANY PATIENT IDENTIFICATION ERRORS		

CPU-V
JMP/TPL/EJD/mab

Dr. Ann Jennings
National Marine Fisheries Service
217 Ft. Johnson Road
Charleston, SC 29412

DATE: 14 November 1991

CONSULTATION REPORT ON CONTRIBUTOR MATERIAL

AFIP DIAGNOSIS: 1-28 1. Lung: Granuloma, focal, Atlantic bottlenose dolphin (Tursiops truncatus), cetacean.
2. Lung, pleura: Fibrosis, focally extensive, mild.
3. Unidentified tissue: Trematode eggs.

Comment: The reported necropsy findings indicate chronic peritonitis resulting from penetration of the gastric wall as the most significant factor in the death of this dolphin. Severe postmortem autolysis hindered histopathologic interpretation. A small granuloma was found in the lung, but no causative agents were identified. The pleural fibrosis is consistent with the necropsy finding of pleural adhesions. Small numbers of trematode eggs within unidentifiable tissue were also found.

JOHN M. PLETCHER, DVM, MPH
Colonel, VC, USA
Chairman, Department of Veterinary Pathology

THOMAS P. LIPSCOMB, DVM
MAJ, VC, USA
Department of Veterinary Pathology

CHARLESTON LABORATORY
FORENSICS PROJECT
NECROPSY NOTES

DATE: August 5, 1991

SPECIES AND SEX: *Tursiops truncatus* - male newborn

LOCATION AND DATE OF STRANDING: Hilton Head, SC - August 1, 1991

SEUS STRANDING NETWORK INFORMATION: SC-91-12

LOCATION OF NECROPSY: NMFS, SEFSC, Charleston Laboratory

NECROPSY NOTES

1. GENERAL COMMENTS:

On August 1, 1991 a dead newborn bottlenose dolphin was sighted among a small pod. It was retrieved and was placed on ice for transport to the NMFS Laboratory in Charleston, SC. The specimen was kept in ice in a walk-in cooler until August 5 when the necropsy was conducted. The condition at the time of examination was late code 2. The necropsy was conducted by Mrs. Ann Jennings, Dr. Sylvia Galloway, Ms. Pat Fair, and Ms. Kathy Moore.

2. EXTERNAL OBSERVATIONS:

The skin of the bottlenose dolphin was light to dark gray in color and had not begun to peel. The dorsal fin and tail flukes were folded over and supple to bending. There was a greenish tint to the skin around the mouth and un-erupted teeth which extended into the blubber layer. There was a 5-7 cm line of numerous hairs approximately 3 cm above the upper lip on either side of the snout. Five lighter-colored grooves or indentations 6-10 mm wide extended around the body (running ventral-dorsal). There were no other marks, scars, abrasions, or lesions externally. The umbilicus was visible with approximately 3 cm of cord still present.

The specimen weighed 29.5 lbs., measured 99 cm in total length, and was identified as a male (penis distended).

3. INTERNAL OBSERVATIONS:

The newborn had a white, healthy blubber layer 1 cm thick around the body. No fat pad was visible beneath the dorsal blubber layer. There was a healthy fatty layer along the ventral blubber layer. The musculature was red and appeared healthy. No parasites were found in the muscle or blubber layers. The lung was dark gray, airless, and spongy in texture. A few tiny decomposition bubbles were present on the dark purplish-gray lung surface.

The heart appeared normal in color and texture. Major blood vessels in and out of the heart were clear and smooth, pink and dark red in color.

Apparently, the adrenal glands did not chill quickly enough and were somewhat decomposed. The kidneys were knobby (renculi) in texture and dark red in color. The intestines appeared healthy - smooth and light red. The three stomachs appeared normal in color and texture. They were clean of matter, except for an orange-yellow fluid in the third stomach. There was a small amount of dark, almost black pasty matter in the large intestine near the rectum. The esophagus and trachea were clean of matter and parasites. The spleen was firm, bluish-gray in color and was in excellent condition. The right liver had white patches and tracks, but was otherwise normal in color and texture.

The testes were approximately 8 cm in length, 1 cm in diameter, and reddish in color.

The blowhole passages and inner ears were clean and free of parasites. After the skin cover was removed from jaws, the teeth wiggled in their sockets when touched. The tongue was in excellent condition, white-pink in color. There was blood in the vitrious fluid of the eye, but no parasites were found in the eyes or eye sockets.

The brain was removed. It had begun to decompose as indicated by the somewhat soupy texture. It was yellowish-pink in color and had a very unpleasant odor.

4. CONCLUSIONS:

The airless lung was probably an indicator of still-birth. The greenish color around the mouth and tooth line, as well as the lack of milk or fluid in the first stomach may also support the conclusion of still-birth. The white patches or scars on the liver may have been the result of a parasitic infection or other disease. The external grooves around the body may have been the result of an umbilical cord wrap during development prior to birth.

5. SAMPLES RETAINED:

Chas Ref #	Sample type
1-29(A)	whole skull including lower jaw
1-29(B)	left and right testes in formalin
1-29(C)	whole left eye
1-29(D)	heart in formalin (ventricles only)
1-29(E)	left liver tissue in teflon
1-29(F)	discarded
1-29(G)	blubber in teflon
1-29(H)	right lung tissue in formalin
1-29(I)	spleen in formalin
1-29(J)	right liver tissue with abnormalities in formalin
1-29(K)	whole tongue in formalin
1-29(L)	right kidney tissue in formalin
1-29(M)	umbilicus in formalin
1-29(N)	left lung tissue in teflon
1-29(O)	left kidney tissue in teflon
1-29(P)	contents of large intestine near rectum
1-29(Q)	melon for lipid analysis
1-29(R)	section of spine, frozen
1-29(S)	sections of greenish blubber from around mouth (frozen)
1-29(T)	left brain in teflon

DEPARTMENT OF DEFENSE
ARMED FORCES INSTITUTE OF PATHOLOGY
WASHINGTON, DC 20306-6000

REPLY TO ATTENTION OF

PATIENT IDENTIFICATION		PLEASE USE AFIP ACCESSION NUMBER IN ALL CORRESPONDENCE
AFIP ACCESSION NUMBER: 2339676-5	CHECK DIGIT:	SEQUENCE: 00
NAME: ANIMAL, CETACEA DOLPHIN 1-29 T		SSAN:
SURGICAL/AUTOPSY PATH ACCESSION #'S		
PLEASE INFORM US OF ANY PATIENT IDENTIFICATION ERRORS		

CPU-V
JMP/TPL/DFF/mab

Dr. Ann Jennings
National Marine Fisheries Service
217 Ft. Johnson Road
Charleston, SC 29412

DATE: 25 November 1991

CONSULTATION REPORT ON CONTRIBUTOR MATERIAL

AFIP DIAGNOSIS: 1-29 Lung: Congenital atelectasis, Atlantic bottlenose dolphin (Trusiops truncatus), cetacean.

Comment: Histologic examination of the lung confirmed your belief that this neonatal dolphin had not breathed. The cause was not apparent. All other submitted tissues were within normal limits. Microscopic lesions that might correspond to the white patches or scars that you described on the liver were not found.

JOHN M. PLETCHER, DVM, MPH
Colonel, VC, USA
Chairman, Department of Veterinary Pathology

THOMAS P. LIPSCOMB, DVM
MAJ, VC, USA
Department of Veterinary Pathology

APPENDIX 2

1992 Necropsy Report

CHARLESTON LABORATORY
FORENSICS PROJECT
NECROPSY NOTES

DATE: 11/24/92

SPECIES AND SEX: *Tursiops truncatus*

LOCATION AND DATE OF STRANDING: 11/23/92, 5th Avenue, Isle of Palms, SC

SEUS STRANDING NETWORK INFORMATION: SC-92-32

LOCATION OF NECROPSY: NMFS, SEFSC, Charleston Laboratory

NECROPSY NOTES

1. GENERAL COMMENTS:

A 244 cm female Tursiops truncatus stranded dead on the Isle of Palms in Charleston county on 11/23/92. The specimen was a code 2 at the time of discovery and at the time of necropsy on 11/24/92. The necropsy was performed by Greg Mitchum, Liz Brinson, Gloria Seaborn, Sylvia Galloway, Sylvia McCorkle, Shelly Wilbanks, James Daugomah and John Waldren at the Charleston NMFS Lab. Full level A data were taken at the time of the necropsy.

2. EXTERNAL OBSERVATIONS:

The animal appeared to be healthy, with no obvious bruising or lacerations. The animal had soft barnacles, identified as *Xenobalanus globicipitis*, on its dorsal fin, flippers, and flukes. The skin was not sloughing off, and there was very minor bloating. The tongue was not bloated, and no lesions were present in the mouth or on the skin. The teeth were very worn. Both eyes were present but glazed, and there appeared to be no fisheries interaction. There was a fairly prominent mass 4" anterior to the mammary slits on the right side, just above the midline. Blubber around the mass was thin, and the animal appeared to have been lactating.

3. INTERNAL OBSERVATIONS:

The blubber thicknesses were: mid-dorsal, 2.2 cm; mid-lateral, 2.0 cm; and mid-ventral, 2.2 cm. The blubber was white to off-white to pink-white from the outer to the

inner layer. The muscle layer was dark red and firm. There were no signs of parasitic infection in the blubber or muscle.

The head was removed first to obtain brain tissue. The brain was semi-firm, creamy pink in color, and was not at all soupy. No parasites were found in the brain or sinus cavities.

The lungs were pinkish-red with white, hard, fibrous nodules throughout that gave the lungs a somewhat lumpy texture. The bronchial tubes were clean and clear of fluids.

The ventricles of the heart were firm, the atria were normal, and the color of the organ was dark red. The liver was bluish-grey and firm. The heart and liver showed no obvious parasitic infections.

The stomachs were tied off at the esophagus and intestine and removed for later analysis. The integrity of the walls were not violated and appeared smooth, pink, and muscular. No evidence of parasites in the esophagus or intestine was noted. The intestine showed very little sign of bloating.

The kidneys and adrenals appeared normal. The renculi were not separating and were firm and cohesive. The uterus, ovaries, and urinary bladder appeared normal. The right mammary gland was swollen and rigid, and contained a viscous white fluid that was easy to express manually.

4. CONCLUSIONS:

The animal appeared to have a healthy blubber layer. The stomach contents have not been examined yet. The only parasites noted were those encysted in the lungs, which are relatively common in stranded *Tursiops truncatus*. The enlarged right mammary gland could be indicative of illness. Formalin samples will be examined for histopathology, but unless further problems are discovered, no definite cause of death can be determined.

5. SAMPLES RETAINED:

Chas. Ref. #	Sample type	Use code
MM2-10-a	r. mammary gland	f,h
MM2-10-b	r. lung	f,h
MM2-10-c	heart	f,h
MM2-10-d	l. liver	f,h,t
MM2-10-e	unknown tissue (body cavity)	f,h
MM2-10-f	stomach	z,l
MM2-10-g	l. lung	f,h
MM2-10-h	muscle	f,h
MM2-10-i	blubber	z,t
MM2-10-j	reproductive tract	f,h,l
MM2-10-k	l. kidney	f,z,h,t
MM2-10-l	r. kidney	z,t
MM2-10-m	appendage from urogenital tract	f,h
MM2-10-n	barnacles	f
MM2-10-o	r. eye	f,h
MM2-10-p	l. eye	f,h
MM2-10-q	r. adrenal gland	f,h
MM2-10-r	l. adrenal gland	f,h
MM2-10-s	artery	f,h
MM2-10-t	brain	f,z,h,b
MM2-10-u	melon	f,h
MM2-10-v	r. liver	f,z,h,t
MM2-10-w	skull	z,l,s

Key to Use codes:
f=preserved in formalin; z=frozen; b=biochemical analysis; h=histopathology; l=life history; t=toxicology; s=skeletal archive

DEPARTMENT OF DEFENSE
ARMED FORCES INSTITUTE OF PATHOLOGY
WASHINGTON, DC 20306-6000

REPLY TO ATTENTION OF

PATIENT IDENTIFICATION		PLEASE USE AFIP ACCESSION NUMBER IN ALL CORRESPONDENCE
AFIP ACCESSION NUMBER: 2401987-9	CHECK DIGIT:	SEQUENCE: 00
NAME: ANIMAL, CETACEA DOLPHIN MM2-10 SC-92-32 T DR MOORE	SSAN:	
SURGICAL/AUTOPSY PATH ACCESSION #'S		
PLEASE INFORM US OF ANY PATIENT IDENTIFICATION ERRORS		

RKH/TPL/MJM/dyj

Dr. Kathy Moore
National Marine Fisheries Service
217 Ft. Johnson Road
Charleston, SC 29412

DATE: 23 June 1993

CONSULTATION REPORT ON CONTRIBUTOR MATERIAL

AFIP DIAGNOSIS: MM2-10 SC-92-32 1. Brain, cerebrum: Meningitis, nonsuppurative, multifocal, mild, with edema, Atlantic bottle-nose dolphin (Tursiops truncatus), cetacean.
2. Heart, myocardium: Fibrosis, multifocal, mild.
3. Lung: Fibrosis, pleural and interstitial, multifocal, moderate, with vascular proliferation.
4. Lung: Pneumonia, interstitial, lymphocytic, multifocal, mild.
5. Lung: Congestion, acute, diffuse, mild, with intra-alveolar edema.
6. Abdominal cavity contents (per contributor): Fibrinous exudate, subacute.
7. Mammary gland: Mastitis, subacute to chronic, diffuse, mild.
8. Sinus cavity contents (per contributor): Trematodes, multiple, consistent with Nasitrema sp., with internal fungal hyphae.
9. Skin, epidermis: Barnacle, consistent with Xenobalanus sp.

Comment: We are unable to determine the cause of death based on the submitted material. The cause of the meningitis is not apparent. We recommend that you submit the remainder of the brain for more extensive examination. Mild myocardial fibrosis, mild interstitial pneumonia, and pleural and interstitial fibrosis with vascular proliferation are common in older dolphins. The pulmonary congestion and edema are nonspecific terminal changes. The specimen that you collected from the abdominal cavity consists of fibrin and mixed inflammatory cells; the source of this inflammatory exudate is unknown. Mild mastitis of this type seems to be very common in lactating mammary glands. The parasites collected from the sinus cavity are consistent with Nasitrema sp. trematodes; these parasites are very common in this location. One of the trematodes contained fungal hyphae. We appreciate the detailed necropsy report. A more extensive sampling of tissues, including liver, bone marrow from a rib, esophagus, eyes, gonads, large and small intestine, pancreas, pituitary, spleen,

ACCESSION #2401987-9
ANIMAL, CETACEA DOLPHIN
MM2-10 SC-92-32

thyroid, parathyroid, tongue, tonsil, trachea, and thymus, would also be helpful.

RICHARD K. HARRIS, DVM
LtCol, USAF, BSC
Chairman, Department of
Veterinary Pathology

THOMAS P. LIPSCOMB, DVM
MAJOR, VC, USA
Department of Veterinary Pathology

APPENDIX 3

1993 Necropsy Reports

CHARLESTON LABORATORY
FORENSICS PROJECT
NECROPSY NOTES

DATE: 02/16/93

SPECIES AND SEX: *Tursiops truncatus* - male

LOCATION AND DATE OF STRANDING: 02/14/93, Kiawah Island, SC

SEUS STRANDING NETWORK INFORMATION: SC-93-3

LOCATION OF NECROPSY: NMFS, SEFSC, Charleston Laboratory

NECROPSY NOTES

1. GENERAL COMMENTS:

The 215 cm male bottlenose dolphin stranded dead on Kiawah Island in Charleston County on the evening of 02/14/93. The specimen was a code 2 at the time of discovery, but was an early code 3 by the time it was retrieved on the evening of 02/15/93. The animal was refrigerated overnight and was still an early code 3 when necropsied on 02/16/93 by Ms. Kathy Moore, Mr. Greg Mitchum, and Ms. Elisabeth Brinson.

2. EXTERNAL OBSERVATIONS:

The animal appeared healthy from the outside, with no apparent bruising or lacerations. Groups of superficial rake marks were present on the animal's skin, mostly on the tail stock. The marks were in groups of 5-6 parallel scrapes (not penetrating the skin) about 1 cm apart. They were assumed to be teeth rakes from mating activities. The skin was not sloughing off, though it was beginning to loosen in some areas. The tongue was not at all bloated and had no lesions. The teeth were only slightly worn. The penis was not distended. Minor bloating in the belly area had occurred. Both eyes were absent due to scavengers. No ectoparasites or fisheries interaction indicators were evident.

3. INTERNAL OBSERVATIONS:

The blubber layer was 18 mm thick immediately anterior to the dorsal fin, 18 mm thick on the right lateral side of the animal midway between the dorsal fin and the umbilicus, and 28 mm thick on the ventral side just anterior to the umbilicus. The blubber layer was off-white to

pink-white and firm in texture. The underlying muscle layer was dark red and firm. Neither the muscle or blubber exhibited signs of parasitic infection.

The head was taken first to obtain good brain tissue. The brain was creamy pink in color, with darker purplish channels. The texture was soft and spongy, not at all soupy. No parasites were noted in the brain or in the sinus cavities. .

The lungs were greyish purple with white nodules throughout. The nodules were hard and fibrous, and gave the surfaces of both lungs a somewhat lumpy texture. The bronchial tubes were clean and clear.

The heart was firm and dark red. No obstruction was noted in the vessels surrounding the heart. No parasites were noted in the heart. The liver was firm, smooth, and dark brown. No parasites were evident in the liver, and only a few small groups of gas bubbles resulting from decomposition were noted. The spleen was dark blue-green (almost black). It was sectioned and appeared uniform throughout.

The three stomachs were tied off at the esophagus and intestine and removed whole for later analysis. They appeared normal from the outside: smooth, pink, and muscular. No parasites were noted in the esophagus or the intestine. The intestine was beginning to bloat and develop a green tinge. The only material found in the intestine was some beige mucous noted in the upper intestine. A 10 cm long piece of intestine about 1 m from the anus appeared constricted or twisted. This section was dark with clotted blood. It was excised, examined, and preserved in formalin.

The kidneys and adrenals appeared normal. A few of the renculi on the edges of each of the kidneys were just beginning separate from the body of the organ, due to decomposition. As a whole, though, the organs were still fairly firm and cohesive. The urogenital system appeared normal. The testes were pink and spongy.

4. CONCLUSIONS:

The animal appeared to have a healthy blubber layer, but did not appear to have eaten recently. Though stomach contents have not been examined, there was no pasty material found in the intestine. The abnormal area on the intestine could be indicative of a problem in the animal's digestive tract.

The lungs contained many encysted parasites, which are relatively common in stranded dolphins. Formalin-fixed tissues will be examined for histopathology. Unless further problems are discovered, no definitive cause of death was determined.

5. SAMPLES RETAINED:

Chas. Ref. #	Sample type	Use code
MM2-19-1	brain (left, central cerebrum)	f,h
MM2-19-2	whole head	z,l,b,s
MM2-19-3	blubber	z,t
MM2-19-4	first 5 ribs	z,l
MM2-19-5	section of r. lung	f,h
MM2-19-6	whole heart	f,h
MM2-19-7	section of r. lobe of liver	f,h
MM2-19-8	r. lobe of liver	z,t
MM2-19-9	section of spleen	f,h
MM2-19-10	whole stomach	z,l
MM2-19-11	adrenals	f,h
MM2-19-12	section of r. kidney	f,h
MM2-19-13	whole kidneys	z,t
MM2-19-14	section of abnormal intestine	f,h
MM2-19-15	whole urogenital system	f,h,l
MM2-19-16	section of muscle	f,h
MM2-19-17	last 4 thoracic vertebrae	z,l

Key to Use codes:
f=preserved in formalin; z=frozen; b=biochemical analysis; h=histopathology; l=life history; t=toxicology; s=skeletal archive

DEPARTMENT OF DEFENSE
ARMED FORCES INSTITUTE OF PATHOLOGY
WASHINGTON, DC 20306-6000

REPLY TO ATTENTION OF

PATIENT IDENTIFICATION		PLEASE USE AFIP ACCESSION NUMBER IN ALL CORRESPONDENCE
AFIP ACCESSION NUMBER	CHECK DIGIT	SEQUENCE
2401990-3		00
NAME	SSAN	
ANIMAL, CETACEA DOLPHIN		
SC-93-3, T. DR MOORE		
SURGICAL/AUTOPSY PATH ACCESSION #'S		
PLEASE INFORM US OF ANY PATIENT IDENTIFICATION ERRORS		

RKH/TPL/KES/dyj

DATE: 12 May 1993

Ms. Kathy Moore
National Marine Fisheries Service
217 Ft. Johnson Road
Charleston, SC 29412

CONSULTATION REPORT ON CONTRIBUTOR MATERIAL

AFIP DIAGNOSIS: CRN-MM2-19SC-93-3 1. Lung: Abscess, chronic, focal, Atlantic bottlenose dolphin (Tursiops truncatus), cetacean.
2. Lung: Pneumonia, interstitial, eosinophilic and lymphoplasmacytic, chronic, diffuse, moderate.
3. Lung: Congestion, diffuse, moderate, with intra-alveolar edema.
4. Liver: Hepatitis, subcapsular, subacute, focal, mild.
5. Distal colon (per contributor): Colitis, lymphoplasmacytic and eosinophilic, diffuse, mild, with minimal focal peritonitis.
6. Spleen: Hyperplasia, lymphoid, diffuse, moderate.
7. Spleen: Congestion, diffuse, moderate.
8. Kidney: Congestion, diffuse, mild.
9. Lymph node, medullary cords: Plasmacytosis, diffuse, mild.

COMMENT: The most significant lesions are the lung abscess and the focal hepatitis. The lung abscess was probably bacterial, but special stains failed to identify causative agents; lungworm infection was likely a predisposing factor. The focal hepatitis may have been caused by hematogenous dissemination of bacteria from the lung. Thus, on the basis of the available material, septicemia secondary to pulmonary abscess is the most likely cause of death. The congestion affecting multiple tissues is considered a nonspecific terminal change. Chronic interstitial pneumonia of the type seen here is common in dolphins and is generally clinically insignificant. The mild colitis was probably caused by parasitism. Spleen and lymph node exhibit reactive changes, indicating a normal response to antigenic stimulation.

ACCESSION #2401990-3
ANIMAL, CETECEA DOLPHIN
SC-93-3

Thank you for submitting this interesting case to the Registry of Veterinary Pathology.

RICHARD K. HARRIS, DVM
LtCol, USAF, BSC
Chairman, Department of
Veterinary Pathology

THOMAS P. LIPSCOMB, DVM
MAJOR, VC, USA
Department of Veterinary Pathology

CHARLESTON LABORATORY
FORENSICS PROJECT
NECROPSY NOTES

HKH

DATE: 03/01/93

SPECIES AND SEX: *Kogia simus* - male

LOCATION AND DATE OF STRANDING: 02/28/93, 711 E. Arctic St., Folly Beach, SC

SEUS STRANDING NETWORK INFORMATION: SC-93-5

LOCATION OF NECROPSY: NMFS, SEFSC, Charleston Laboratory

NECROPSY NOTES

1. GENERAL COMMENTS:

The 215 cm male dwarf sperm whale stranded dead on Folly Beach in Charleston county on 02/28/93. The specimen was a code 2 at the time of discovery, but was an early code 3 by the time it was recovered and necropsied on 03/01/93. Full level A data were taken and the necropsy was performed by Ms. Kathy Moore, Dr. Sylvia Galloway, Ms. Gloria Seaborn, and Ms. Elisabeth Brinson at the Charleston NMFS laboratory.

2. EXTERNAL OBSERVATIONS:

The animal had abrasions and lacerations over much of the body, particularly the head, due to the fact that it stranded on rocks and next to a barnacle-covered wooden jetty. The animal was just beginning to bloat; the skin was beginning to wrinkle and loosen due to decomposition, but it was not sloughing off and the penis was not distended. The tongue was not swollen. The eyes were dried but still present. The belly was mottled red. Scar-like lesions were present in the genital slit. Three teeth were missing (broken off at the root) from the right lower jaw. No teeth were present in the upper jaw. No ectoparasites were noted.

3. INTERNAL OBSERVATIONS:

The blubber layer was 25 mm on the ventral side of the animal just anterior to the umbilicus, 19 mm on the lateral side directly below the leading edge of the dorsal fin, and 24 mm on the dorsal side of the animal just anterior to the dorsal fin. Many off-white jelly-like parasitic cysts were found in the blubber layer in patches, particularly on the ventral side of the

animal between the anal and genital slits and on the dorsal side of the animal just posterior to the dorsal fin. The muscle was very dark red, almost black, and slightly gelatinous in texture (apparently due to decomposition). The internal organs appeared to be fresh, with little evidence of decomposition. The heart was free of parasites. The ventricle on one side appeared thinner than the other ventricle. The major vessels to the heart were smooth and free of plaque.

The lungs were reddish in color, contained air, and were free of cysts or hardened lymph nodes. There was pooled blood in the chest area. The right lung and corresponding bronchial tube exuded white foam when cut. The left lung exuded bloody foam from the bronchial tube and upper portion of the lung, and a sticky yellowish foam from the tip of the lung.

The liver was dark grey in color. It was free of nodules or other signs of parasites. The spleen was a very dark blue-green and appeared normal.

Small-diameter light yellow nematodes were present in the esophagus; nothing else was present. The stomachs were tied off at the esophagus and intestine and removed whole for later examination. The pyloric stomach was dark grey. Other stomachs were pinkish. The upper intestine was empty, and several feet of the lower intestine were packed with very hard, dark red-brown fecal material. The kidneys were dark grey to black in color, contained no apparent parasites, and exhibited little evidence of decomposition. The adrenals could not be located.

The testes were pinkish beige. Latitudinal sections revealed them to be uniform structures with a network of tubes that contained a white milky fluid. The left testis appeared to have a small amount of blood clotted along one side from end to end. The epididymis was examined and appeared normal. The penis was 50-60 cm long and surrounded by highly vascularized tissue. The bladder released a small amount of milky fluid when pressure was applied. The tissue of the bladder was not specifically observed.

A few nematodes (very similar to those found in the esophagus) were found in the blowhole. The walls of the sinus cavities were evenly lined with whitish, oblong projections about 2 mm in length. The skull and skeleton were partially flensed for future preservation.

4. CONCLUSIONS:

The parasite load on the animal did not appear heavy enough to be the primary cause of death. The foam in the lungs is indicative of rapid respiration prior to death. The blood in the upper portion of the left lung may have been an artifact of the necropsy. The animal was lying on its left side, and the left lung was one of the last organs to be examined; pooled blood could have made its way into the bronchial tube. It is, however, not likely that the discoloration of the foam at the tip of the left lung is due to contamination by blood during the necropsy. The fact that the foam even in the tip of the left lung was yellowish indicated the potential presence of an infection which could have resulted in the animal's death.

5. SAMPLES RETAINED:

Chas. Ref. #	Sample type	Use code
MM2-20-1	lesions from genital slit	f,h
MM2-20-2	blubber	z,t
MM2-20-3	parasitic cysts from blubber	f,h
MM2-20-4	first 5 ribs	z,l
MM2-20-5	section of r. lung	f,h
MM2-20-6	tip of r. lung	f,h
MM2-20-7	section of r. lung	f,h
MM2-20-8	r. lobe of liver	z,t
MM2-20-9	section of r. lobe of liver	f,h
MM2-20-10	r. flipper	z,l,s
MM2-20-11	r. scapula	z,l,s
MM2-20-12	kidneys	z,t
MM2-20-13	section of r. kidney	f,h
MM2-20-14	whole heart	f,h
MM2-20-15	whole spleen	f,h
MM2-20-16	whole stomach	z,l
MM2-20-17	section of r. testicle	f,h,l
MM2-20-18	unknown tissue found near r. kidney	f,h
MM2-20-19	feces	z,b
MM2-20-20	section of intestine	f,h
MM2-20-21	parasites from esophagus	f,h,l
MM2-20-22	parasites from blowhole	f,h,l
MM2-20-23	r. eye	f,h
MM2-20-24	lining of sinus cavities	f,h,l
MM2-20-25	isopod from exterior of animal	f,l
MM2-20-26	whole head	z,l,b,s
MM2-20-27	remaining skeleton	z,l,s

Key to Use codes:
f=preserved in formalin; z=frozen; b=biochemical analysis; h=histopathology; l=life history; t=toxicology; s=skeletal archive

DEPARTMENT OF DEFENSE
ARMED FORCES INSTITUTE OF PATHOLOGY
WASHINGTON, DC 20306-6000

REPLY TO ATTENTION OF

PATIENT IDENTIFICATION		PLEASE USE AFIP ACCESSION NUMBER IN ALL CORRESPONDENCE
AFIP ACCESSION NUMBER	CHECK DIGIT	SEQUENCE
2401988-7		00
NAME	SSAN	
ANIMAL, CETACEA WHALE SC-93-5 T DR MOORE		
SURGICAL/AUTOPSY PATH ACCESSION #'S		
PLEASE INFORM US OF ANY PATIENT IDENTIFICATION ERRORS		

RKH/TPL/REB/dyj

Dr. Kathy Moore
National Marine Fisheries Services
217 Ft. Johnson Road
Charleston, SC 29412

DATE: 26 April 1993

CONSULTATION REPORT ON CONTRIBUTOR MATERIAL

AFIP DIAGNOSIS: SC-93-5 1. Liver: Congestion, centrilobular, diffuse, severe, with multifocal hemosiderosis, dwarf sperm whale (Kogia simus), cetacean.
2. Spleen: Congestion, acute, diffuse, severe.
3. Lung: Congestion, acute, diffuse, moderate, with multifocal intra-alveolar edema.
4. Liver, hepatocytes: Vacuolar change, diffuse, mild.
5. Liver, hepatocytes: Eosinophilic bodies, multifocal, mild.
6. Lining from sinus cavity (per contributor): Hyperplasia, papillary, diffuse, moderate, with stromal fibrosis.
7. Genital slit (per contributor): Inflammation, lymphoplasmacytic, diffuse, mild.
8. Kidney: Congestion, acute, diffuse, moderate.
9. Helminths from esophagus (per contributor): Nematodes.
10. Parasites from blubber (per contributor): Larval cestodes.

COMMENT: We are unable to determine the cause of stranding and death based on the submitted material. However, the severe centrilobular hepatic congestion with hemosiderosis is typical of that seen in the cardiomyopathy of pygmy and dwarf sperm whales. Microscopic examination of the heart (particularly the right ventricle and interventricular septum) would be necessary to confirm the diagnosis, but heart was not submitted. The necropsy report indicates that one of the ventricles was thinner than the other. A reference on this condition is cited below. Acute congestion affecting multiple organs is considered a nonspecific terminal change. The papillary hyperplasia of the lining of a sinus is unusual in our experience, but clinically insignificant. We are unable to specifically identify the nematodes found in the esophagus, although they may be ascarids. The parasites from the cysts in the blubber are larval cestodes, which are quite common. The tissue you submitted as "abnormal tissue near kidney" is identified as normal adrenal gland. The other lesions listed above are incidental findings. We appreciate the detailed necropsy report; a more complete sampling of tissues would be helpful.

ACCESSION # 2401988-7
CETACEA WHALE
SC-93-5

Bossart, G. D. et al: Cardiomyopathy in stranded pygmy and dwarf sperm whales. J Am Vet Med Assoc 1985; 187: 1137-1140.

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CHARLESTON LABORATORY
FORENSICS PROJECT
NECROPSY NOTES

HCM

DATE: 03/12/93

SPECIES AND SEX: *Mesoplodon europaeus* (species identity not certain)

LOCATION AND DATE OF STRANDING: Cape Island, SC, 32°02' N, 79°21' W, 03/10/93

SEUS STRANDING NETWORK INFORMATION: SC-93-7

LOCATION OF NECROPSY: Cape Is., Cape Romaine NWR, Charleston County, SC

NECROPSY NOTES

1. GENERAL COMMENTS:

The 425 cm beaked whale stranded on Cape Island on 03/10/93. It was sighted by Sally Murphy, State Marine Mammal Stranding Network Coordinator, when she was on aerial survey on 03/11/93. A local shad fisherman said that he first saw the whale on 03/10/93. The animal was probably a code 2 when it was first sighted, but was a code 3 when it was necropsied on 03/12/93. The whale was in the surf and washing away when we reached it. Level A measurements and photos were taken while the animal was in the surf. Girth measurements were arrived at by taking the animal's half-girth and multiplying by two. Full level A data were taken and the necropsy was performed by Ms. Sally Murphy (SC Stranding Network Coordinator and SCW&MRD), Mr. Tom Murphy (SCW&MRD), Ms. Kathy Moore (NMFS, Charleston), and Mr. Barry Stieglitz (USFWS, Cape Romaine NWR).

2. EXTERNAL OBSERVATIONS:

The animal was very dark grey to black in color, with numerous healed scars over most of the body, presumably from mating activities. The two prominent teeth in the lower jaw were erupted and were low-profile and triangular in shape. The animal had no fluke notch. Scavengers had eaten an area at the angle of the mouth on the animal's left side and an area on the belly near the anal slit (this hole penetrated the body wall). Skin was starting to rub away in places, but was not sloughing off in sheets. Several shallow (not more than 0.5 cm deep), bloody gashes were present on the animal's right side just posterior to the head. The gashes ran perpendicular to the length of the body. No external parasites were found. The animal exhibited little bloating from the outside, but this was probably due to the fact

that scavengers had penetrated the body wall. The tongue was not bloated.

3. INTERNAL OBSERVATIONS:

The blubber layer was 32 mm thick on the animal's dorsal side behind the dorsal fin, 22 mm thick on the lateral side, and 29 mm thick on its ventral side. The blubber layer contained some encysted parasites, particularly around the anal and genital slits. The parasitic cysts were creamy white in color, oblong in shape, and jelly-like in texture. They were not abundant, and they came free of the blubber very easily. None were taken, but they appeared to be the same type of blubber parasite that was found in the Kogia simus, SC-93-5 (Charleston Reference Number MM2-20-3). The muscle was very dark red and slightly gelatinous in texture. No parasites were noted in the muscle layer.

The internal organs were still distinct, though bubbles (presumably from decomposition) were evident on the surface of most organs, particularly the kidneys. The heart was firm and dark red, with no obvious parasites. Major vessels to the heart were smooth and clear of plaque.

The lungs were red in color and contained air. No enlarged lymph nodes or parasitic cysts were noted. The bronchial tubes were clear of parasites or obstructions.

The liver was dark red-brown. The texture was somewhat gelatinous due to decomposition. The spleen was large, dark grey, and firm. No nodules or scars were noted in the liver or the spleen.

The esophagus was pink and smooth. It contained a few small off-white nematodes. The stomachs and intestine were bloated. All of the stomachs contained small nematodes. The first stomach contained no food -- only a small amount of mucous. The second stomach contained a bright yellow slime (more like mucous in texture than paste), and the third stomach contained a bright orange slime. The inside of the wall of the third stomach was mottled with an olive-drab coating. No recognizable parts of possible food items were found.

The kidneys were dark red-brown in color. The renculi were beginning to become indistinct and gelatinous. Adrenals could not be located. The bladder was pink and smooth. Testes could not be located.

No parasites were found in the blowhole when the skull was partially flensed. The skull was retained for confirmation of species identification and for skeletal archive.

4. CONCLUSIONS:

The animal did not appear to have a heavy parasite load. As it is an unusual species, it is difficult to determine whether the blubber layer was of a normal thickness. It appeared as if the animal had not eaten very recently or had regurgitated. The olive-drab coating on the inside of the third stomach could have been bile. No major trauma or bruising was noted on the inside or outside of the animal. Formalin-fixed tissues will be examined for histopathology. Unless further problems are discovered, no definitive cause of death was determined.

5. SAMPLES RETAINED:

Chas. Ref. #	Sample type	Use code
MM2-22-1	first 5 ribs	z,l,s
MM2-22-2	whole heart	f,h
MM2-22-3	section of l. lung	f,h
MM2-22-4	section of l. lobe of liver	f,h
MM2-22-5	section of l. kidney	f,h
MM2-22-6	section of wall of third stomach	f,h
MM2-22-7	section of l. lung	z,l,b
MM2-22-8	liver	z,t
MM2-22-9	l. kidney	z,t
MM2-22-10	blubber	z,t
MM2-22-11	section of blubber	f,h
MM2-22-12	melon	z,b
MM2-22-13	muscle	z,t,i
MM2-22-14	section of muscle	f,h
MM2-22-15	spleen	z,l,b
MM2-22-16	section of spleen	f,h
MM2-22-17	nematodes from stomach	f,h
MM2-22-18	unidentified tissue from near l. kidney	f,h

Whole head was collected by S. Murphy, SC Wildlife and Marine Resources Department.

Key to Use codes:
f=preserved in formalin; z=frozen; b=biochemical analysis; h=histopathology; i=isoelectric focusing; l=life history; t=toxicology; s=skeletal archive

DEPARTMENT OF DEFENSE
ARMED FORCES INSTITUTE OF PATHOLOGY
WASHINGTON, DC 20306-6000

REPLY TO ATTENTION OF

PATIENT IDENTIFICATION		PLEASE USE AFIP ACCESSION NUMBER IN ALL CORRESPONDENCE
AFIP ACCESSION NUMBER 2401986-1	CHECK DIGIT	SEQUENCE 00
NAME ANIMAL, CETACEA WHALE SC-93-7 T DR MOORE	SSAN	
SURGICAL/AUTOPSY PATH ACCESSION #'S		
PLEASE INFORM US OF ANY PATIENT IDENTIFICATION ERRORS		

RKH/TPL/JSE/dyj

Dr. Kathy Moore
National Marine Fisheries Service
217 Ft. Johnson Road
Charleston, SC 29412

DATE: 1 June 1993

CONSULTATION REPORT ON CONTRIBUTOR MATERIAL

AFIP DIAGNOSIS:

SC-93-7 1. Third stomach (per contributor): Gastritis, eosinophilic, chronic, diffuse, moderate, with cestodes and intraluminal nematode, beaked whale (Mesoplodon europaeus), cetacean.
2. Kidney: Nephritis, periglomerular and interstitial, mononuclear, multifocal, mild.
3. Heart; lung; liver; spleen; lymph node; skeletal muscle: Within normal limits.

COMMENT: Advanced postmortem autolysis greatly hampered histologic interpretation. We are unable to determine the cause of death from the submitted material. The gastritis is attributed to the tapeworms that are embedded in the mucosa; a poorly preserved nematode that could not be more specifically classified was free in the lumen of the stomach. The cause of the nephritis is not evident; its mild nature suggests that it was not clinically significant.

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CHARLESTON LABORATORY
FORENSICS PROJECT
NECROPSY NOTES

DATE: 4/22/93

SPECIES AND SEX: *Tursiops truncatus*, female

LOCATION AND DATE OF STRANDING: Bird Key, Charleston County, 4/22/93

SEUS STRANDING NETWORK INFORMATION: SC-93-16

LOCATION OF NECROPSY: Bird Key

LEVEL A DATA COLLECTED BY: A. Colbert, K. Moore

NECROPSY TEAM MEMBERS: A. Colbert, K. Moore

NECROPSY NOTES

1. GENERAL COMMENTS: (Include species, total length, sex, whether single or multiple occurrence, condition code, exact location of stranding, air and water temperature, other weather conditions.)

The 270 cm female bottlenose dolphin stranded dead on Bird Key on 4/22/93. She was stranded about 50 feet from a dead stranded *Stenella frontalis*, which appeared to have been dead for much longer and was assumed to be unrelated. The *Tursiops* was a code 3. The wind was gusting 15 to 25 mph and the air temperature was about 75° F. The necropsy was performed on the beach.

2. EXTERNAL OBSERVATIONS: (Include estimated maturity of animal, presence or absence of ectoparasites, lesions, apparent trauma or bruising, scar patterns, signs of decomposition, fisheries interaction indicators, damage due to scavengers. Examine and comment on eyes, mouth, teeth, blowhole, anal and genital slits.)

The animal was mature, with teeth slightly worn. She was bloated and the skin was split and beginning to peel. The tongue was beginning to bloat. No ectoparasites were noted. Scavengers had eaten away area near the genital slit, and a membrane was protruding from the hole in the body wall.

3. INTERNAL OBSERVATIONS:

The animal's external appearance suggested that most of the internal organs would be too decomposed to yield good data. The animal was opened to collect the stomach and to investigate the membrane protruding from the hole that scavengers had made in the body wall. It was discovered that the internal organs were much less degraded than expected, and a cursory necropsy was performed.

The lungs were smooth and spongy, and appeared normal in color and consistency. Extensive adhesions were present in the peritoneal cavity. The stomach was adhered to the liver, to the intestine, and to the body wall. It was tied off at the esophageal and intestinal ends and collected whole for analysis of stomach contents by Dr. Dan Odell. The spleen contained worms and worm tracks. No parasites were noted in the esophagus or the intestine, though they were not extensively examined. The liver was smooth and semi-firm, with a slight greenish tinge (assumed to be from decomposition).

The animal was pregnant with a 58 cm male fetus. Small green spots (1 to 2 mm in diameter) were present in the enlarged mammary glands. Part of the uterus was protruding through the hole in the body wall. The amniotic membrane had not been punctured. There were small yellow grainy bumps (1 to 2 mm in diameter) on the amniotic membrane and on the umbilical cord. The bumps were 0.5 to 1 cm apart, and uniformly covered the affected surfaces.

4. CONCLUSIONS: (possible cause of death, apparent health of the animal, etc.)

Due to the fact that the animal appeared quite decomposed from the outside and due to the inclement field conditions, a thorough necropsy was not performed. The gross dissection performed revealed that the animal had been ill, but it remains unclear what the immediate cause of death was. The extensive adhesions in the area of the stomach possibly indicated healing injuries or irritation. The green spots in the mammary glands and the yellow bumps on the amniotic membrane and the umbilical cord were abnormal. The parasitic infection in the spleen was heavy. It is hoped that histopathological analysis of the tissues collected will yield information on the cause of death.

5. SAMPLES RETAINED:

Chas. Ref. #	Sample type	Use code	Disposition/storage
MM2-33-B	fetus	l,h	f
MM2-33-C	liver	t	z
MM2-33-D	r. kidney	t	z
MM2-33-E	amniotic membrane	h	f
MM2-33-F	intestine	h	f
MM2-33-G	umbilical cord	h	f
MM2-33-H	amniotic membrane and uterus lining	h	f
MM2-33-I	uterus	l	z
MM2-33-J	blubber	t	z
MM2-33-K	spleen	h	f
MM2-33-L	spleen	h	f
MM2-33-M	lung	h	f
MM2-33-N	amniotic fluid	b,l	z
MM2-33-O	whole head	l,s	z
MM2-33-P	stomach and liver	l	z

Key to Use codes:
f=preserved in formalin; z=frozen; b=biochemical analysis; h=histopathology; l=life history; t=toxicology; s=skeletal archive

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WASHINGTON, DC 20306-6000

REPLY TO ATTENTION OF

PATIENT IDENTIFICATION		PLEASE USE AFIP ACCESSION NUMBER IN ALL CORRESPONDENCE
AFIP ACCESSION NUMBER	CHECK DIGIT	SEQUENCE
2408808-0		00
NAME		SSAN
ANIMAL, CETACEA DOLPHIN CRN MM2-33 T DR COLBERT		
SURGICAL/AUTOPSY PATH ACCESSION #'S		
PLEASE INFORM US OF ANY PATIENT IDENTIFICATION ERRORS		

RKH/TPL/REB/dyj

Dr. Ann Colbert
National Marine Fisheries Service
217 Ft. Johnson Rd.
Charleston, SC 29412

DATE: 1 July 1993

CONSULTATION REPORT ON CONTRIBUTOR MATERIAL

AFIP DIAGNOSIS: CRN MM2-33 1. Lung: Pneumonia, eosinophilic and lymphohistiocytic, multifocal, moderate, Atlantic bottlenose dolphin (Tursiops truncatus), cetacean.
2. Lung, pleura: Fibrosis, diffuse, mild, with vascular proliferation.
3. Spleen; fetal membrane; umbilical cord: Within normal limits.

COMMENT: We are unable to determine the cause of death from the submitted material. Pneumonia of this type is common in dolphins and was probably caused by parasitism. Pleural fibrosis accompanied by proliferation of small blood vessels is also common and clinically insignificant; the cause of this lesion is unknown. Neither parasites nor migration tracts were found in the spleen. The fetal membrane and umbilical cord appeared normal histologically.

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CHARLESTON LABORATORY
FORENSICS PROJECT
NECROPSY NOTES

DATE: 04/30/93

SPECIES AND SEX: *Tursiops truncatus* female

LOCATION AND DATE OF STRANDING: Charleston Harbor, 04/29/93

SEUS STRANDING NETWORK INFORMATION: SC-93-17

LOCATION OF NECROPSY: NMFS Charleston Laboratory

LEVEL A DATA COLLECTED BY: A. Colbert, K. Moore, G. Mitchum

NECROPSY TEAM MEMBERS: A. Colbert, K. Moore, G. Mitchum

NECROPSY NOTES

1. GENERAL COMMENTS: (Include species, total length, sex, whether single or multiple occurrence, condition code, exact location of stranding, air and water temperature, other weather conditions.)

The 256 cm female bottlenose dolphin was retrieved from Charleston Harbor by the R/V *Carolina Pride* (SCWMRD) on 04/29/93. It was brought to the NMFS Charleston Laboratory and was placed in the walk-in cooler until necropsy on 04/30/93. The animal was a late code 2 on receipt and was an early code 3 when necropsied. The air temperature on 04/29/93 was about 75° F.

2. EXTERNAL OBSERVATIONS: (Include estimated maturity of animal, presence or absence of ectoparasites, lesions, apparent trauma or bruising, scar patterns, signs of decomposition, fisheries interaction indicators, damage due to scavengers. Examine and comment on eyes, mouth, teeth, blowhole, anal and genital slits.)

The animal was an adult; teeth were slightly worn. She exhibited numerous small skin lesions, which have been described as "pinhole" lesions. The skin lesions were circular in shape, varied in size from 0.2 cm to 2 cm in diameter, and were characterized by a small pinhole surrounded by a light grey circular discolored area. Several of the lesions were removed immediately upon receipt of the animal and placed in formalin. Lesions were not

present in the mouth. A lesion of questionable origin, approximately 4 cm in length and 1.5 cm in width was visible on the right mid-lateral surface below the dorsal fin. The lesion could have been the result of efforts to retrieve the animal. It was removed and placed in formalin.

The tip of the dorsal fin was missing, but the trailing edge was relatively unscarred. The missing tip of the fin was estimated to have been 1.0 to 1.5 cm. A number of healed tooth rake marks were evident on the animal's dorsal and lateral sides.

A very light load of *Nasitrema* was found in the blowhole upon partial flensing of the head. External bruising was not apparent. There was no damage to the animal from scavengers.

The right eye was cloudy, with a viscous fluid over the exposed area. The right eye was collected in formalin. The left eye was sunken and not readily visible. The tongue was not swollen, though the animal was beginning to bloat. The skin was beginning to slough off.

3. INTERNAL OBSERVATIONS:

The primary incision was made dorsal-to-ventral just behind the right flipper, and then along the ventral midline to the genital slit. The incision did not penetrate the muscle layer. No parasites were noted in the blubber layer or the muscle layer. The blubber was 2.0 cm thick at both the mid-dorsal and the mid-ventral sites, and was 1.8 cm thick at the mid-lateral site. A distinct fat pad under the vascular layer was not apparent.

The scapula was carefully removed. As the muscle layer was dissected away, a large amount of clotted blood was noted in a circular area approximately 35 cm in diameter. The area of clotted blood was above the right flipper.

Ribs two, three, and four on the animal's right side were found to be broken. The broken edges were extremely sharp, and had severed the right bronchial tube and made several gashes in the underside of the right lung. What were thought to be fibrin tags were apparent on the outer surface of the right lung. Since no major bruising was apparent in the blubber layer, it was not determined whether the broken ribs occurred pre-mortem. Enlarged pulmonary lymph nodes were collected in formalin.

The heart was normal in color, but the right atrium was shrunken and flabby. Wart-like lumps, about 0.5 cm in diameter, were present on the surface of the right atrium. The abnormal atrial tissue was taken and preserved in formalin. The rest of the heart was sectioned and preserved in formalin. It appeared to be normal, with no visible parasites.

The liver was showing signs of decomposition. A sample was collected with a titanium knife into teflon for metals analysis. A small sample was taken for histopathology. A mass, thought to be a lymph node, was removed from the liver area and preserved in formalin.

The kidneys and adrenals were examined and appeared normal. Adrenals were collected. Kidney samples were not collected due to degree of decomposition. A hard mass was collected from the body wall near the right kidney and preserved in formalin.

The stomach was tied off at the esophageal and intestinal ends and removed whole. A portion of a small, partially digested fish was collected from the upper esophagus; it was included in the bag with the stomach. The stomach felt full. Mud and matter were found in the lower esophagus. There were minor adhesions in the stomach area. An unidentified mass

was removed from the stomach and preserved in formalin. The spleen appeared abnormal, with fibrin tags on the exterior.

Several connected nodules were present on a section of the intestine approximately 20 cm in length. The nodules were hard, and appeared to be solid cream-colored tissue with yellow centers. They varied in size from 1 cm to 5 cm. Unidentified nodules were also removed from the mesentery of the intestine.

The mammary glands were swollen with milk, some of which was expressed into a plastic tube and frozen. Parasites were not evident in the mammary ducts. A section of the right mammary gland was collected in formalin.

The reproductive tract was collected whole and frozen. Several nodules similar in composition to the ones found in the mesentery of the intestine were present along the reproductive tract. There was a yellowish mucoid liquid in the vagina.

The head was partially dissected. A light load of worms was found in the throat, as well as in the sinuses near the blowhole opening. A purplish-brown discoloration was noted in the blubber/fatty layer along the edges of the upper and lower jaws. The right eye and the lens of the left eye were removed and placed in formalin. A section of the melon was removed and frozen.

4. CONCLUSIONS: (possible cause of death, apparent health of the animal, etc.)

The animal had obviously been subjected to some type of trauma, causing the adhesions in the digestive tract. No perforation of the digestive tract was visible. Pathology reports may yield information about the origin of the nodules found throughout the body, the possibly enlarged lymph nodes, and the lesions present on the skin. The thickness of the blubber layer did not indicate that the animal was emaciated. Though the stomach was not dissected, it was apparent that the animal had fed recently. Though the broken ribs and severed bronchial tube were significant enough to have caused death, the lack of bruising in the blubber layer above the broken ribs leaves some suspicion that the injuries may have occurred after death.

5. SAMPLES RETAINED:

Chas. Ref. #	Sample type	Use code	Disposition/storage
MM2-35-A	melon	b	z
MM2-35-B	r. liver	t	z
MM2-35-C	blubber	t	z
MM2-35-D	urogenital system	l	z
MM2-35-E	whole heart	l,h	f
MM2-35-F	r. lung	h	f
MM2-35-G	adrenals (l. is tagged)	h	f
MM2-35-H	lymph node	h	f
MM2-35-I	r. eye and lens of l. eye	h	f
MM2-35-J	r. lung with fibrin tags	h	f
MM2-35-K	lymph from near r. lung	h	f
MM2-35-L	unidentified tissue from between stomach and intestine	h	f
MM2-35-M	lesions from skin	h	f
MM2-35-N	r. atrium with unusual growth	h	f
MM2-35-O	l. lung with fibrin tags	h	f
MM2-35-P	milk	b,t	z
MM2-35-Q	r. liver	h	f
MM2-35-R	lymph node from near liver	h	f
MM2-35-S	whole stomach	l	z
MM2-35-T	spleen with fibrin tags	h	f
MM2-35-U	unknown tissue from mesentery around intestine	h	f
MM2-35-V	r. mammary	h	f
MM2-35-W	tissue from body wall near kidney	h	f
MM2-35-X	ribs (1 and 9)	s,t	z
MM2-35-Y	vertebrae (ribs 3 - 7 were attached)	s,t,l	z
MM2-35-Z	worms from back of mouth	h	f
MM2-35-AA	whole head	l,s	z

Key to Use codes:
f=preserved in formalin; z=frozen; b=biochemical analysis; h=histopathology; l=life history; t=toxicology; s=skeletal archive

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WASHINGTON, DC 20306-6000

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PATIENT IDENTIFICATION		PLEASE USE AFIP ACCESSION NUMBER IN ALL CORRESPONDENCE
AFIP ACCESSION NUMBER: 2408809-8	CHECK DIGIT:	SEQUENCE: 00
NAME: ANIMAL, CETACEA DOLHIN CRN MM 2-35 T DR COLBERT	SSAN:	
SURGICAL/AUTOPSY PATH ACCESSION #'S		
PLEASE INFORM US OF ANY PATIENT IDENTIFICATION ERRORS		

RKH/TPL/KES/dyj

Ann Colbert
National Marine Fisheries Service
217 Ft. Johnson Road
Charleston, SC 29412

DATE: 22 June 1993

CONSULTATION REPORT ON CONTRIBUTOR MATERIAL

AFIP DIAGNOSIS: CRN MM 2-35 1. Lung: Pneumonia, eosinophilic and lymphohistiocytic, chronic-active, multifocal, moderate, Atlantic bottlenose dolphin (Tursiops truncatus), cetacean.
2. Lung, pleura: Fibrous tags, multifocal.
3. Lung: Fibrosis, pleural and interstitial, multifocal, moderate, with vascular hyperplasia.
4. Lymph node: Lymphadenitis, necrotizing, eosinophilic and granulomatous, multifocal, mild.
5. Lymph nodes, multiple: Eosinophilia, mild to moderate.
6. Heart, myocardium: Fibrosis, interstitial, multifocal, mild.
7. Skin: Dermatitis, mononuclear, focally extensive, minimal, with hyperpigmentation.
8. Mammary gland: Mastitis, mononuclear, multifocal, mild.
9. Tissue from area of posterior oral cavity (per contributor): Fibrin, with mild eosinophilic inflammation.

COMMENT: Moderate postmortem autolysis hampered histopathologic interpretation. We are unable to determine the cause of death based on the submitted material. The pneumonia was probably caused by lungworm infection; verminous pneumonia is very common in dolphins and is usually clinically insignificant. Pleural and interstitial pulmonary fibrosis with vascular proliferation, mild myocardial fibrosis, and mild mastitis are also common. The lymphadenitis was probably caused by parasitic migration. The fibrous tags present on the pleura suggest previous pleuritis. The cause of the dermatitis is not apparent. The submitted sample identified as worms from the mouth consists of strands of fibrin with interspersed eosinophils. We appreciate the excellent necropsy report.

2408809-8
ANIMAL, CETACEA DOLPHIN
CRN MM 2-35 T DR COLBERT

More extensive sampling of tissues for histopathology is recommended.

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CHARLESTON LABORATORY
FORENSICS PROJECT
NECROPSY NOTES

DATE: 5/11/93

SPECIES AND SEX: *Tursiops truncatus* female

LOCATION AND DATE OF STRANDING: 9th Ave., Isle of Palms, Charleston, SC

SEUS STRANDING NETWORK INFORMATION: SC-93-19

LOCATION OF NECROPSY: NMFS Charleston Laboratory

LEVEL A DATA COLLECTED BY: A. Colbert, K. Moore, E. Brinson

NECROPSY TEAM MEMBERS: A. Colbert, K. Moore, E. Brinson

NECROPSY NOTES

1. GENERAL COMMENTS: (Include species, total length, sex, whether single or multiple occurrence, condition code, exact location of stranding, air and water temperature, other weather conditions.)

The 245 cm female bottlenose dolphin stranded dead early on 5/11/93 at 9th Avenue on Isle of Palms in Charleston County, SC. The air temperature was about 75° F when she was retrieved by NMFS Charleston Laboratory personnel at 11:00 AM. The animal was an early code 3.

2. EXTERNAL OBSERVATIONS: (Include estimated maturity of animal, presence or absence of ectoparasites, lesions, apparent trauma or bruising, scar patterns, signs of decomposition, fisheries interaction indicators, damage due to scavengers. Examine and comment on eyes, mouth, teeth, blowhole, anal and genital slits.)

The animal exhibited numerous round lesions of varying size both on the skin and in the mouth. The lesions varied in diameter from about 1 cm to 8 cm. Some of the lesions were what has previously been described as "pinhole" lesions. Most of the lesions were open sores that extended into the blubber layer. When these lesions were sectioned, a dark grey necrotic area was observed in the underlying blubber. Lesions from the skin and the tongue were removed and placed in formalin. Two ectoparasites were noted on the tail stock of the

animal. The parasites were worm-like and projecting from the skin. They were removed with accompanying plugs of blubber and skin and preserved in formalin.

The animal's teeth were worn flat on the sides. Several teeth were completely missing and some were broken off. The tongue exhibited lesions. The tongue was not bloated. No parasites or abnormalities were noted in the blowhole, nasal sinuses, eyes, anal slit, or genital slit. She was an early code 3. Skin was dry but not peeling, and she was just beginning to bloat.

3. INTERNAL OBSERVATIONS:

Mid-dorsal blubber thickness was measured as 2.5 cm, mid-lateral 2.0 cm, and mid-ventral as 3.0 cm. The primary incision was made from the dorsal midline to the ventral midline, just posterior to the right flipper, and then along the ventral midline to the genital slit. The blubber was white to pinkish-white and exhibited no sign of parasites. As the blubber was peeled back, the underlying muscle was examined; no abnormalities were noted. The ribs and muscle were removed to expose the right lung. The lung was spongy and contained hardened nodules. Several small (2 to 3 mm in diameter) black spots were noted on the surface of the lung. When the lung was dissected, blood and a worm were found in the bronchioles. A pulmonary lymph node was examined and appeared normal in color and size.

The heart was removed and examined. Major vessels were clear of obstruction, and no parasites were noted. The ventricles were firm and dark red, with whitish stringy fibers spanning the inside of the chambers.

The liver was beginning to exhibit signs of decomposition. It was smooth and somewhat spongy. There was whitish scar tissue on the underside of the right lobe. The stomach and intestines had mild adhesions. The esophageal and intestinal ends of the stomach complex were tied off, and the stomach was removed whole. The stomach felt full, though the contents were not examined. The stomach will be sent to Dr. Dan Odell for analysis of contents. The spleen appeared normal. The intestine was not closely inspected, but it was noted that a dense, pasty, mustard-orange substance was in the intestine near the rectum. No parasites were noted in the colon or the esophagus. The intestines exhibited a greenish tinge and were somewhat bloated.

The kidneys were beginning to show signs of decomposition, though the renculi were still firm and cohesive. The adrenal glands were inspected and removed. Neither the adrenals nor the kidneys appeared abnormal in color or shape. The reproductive tract and the bladder were inspected and removed intact. The ovaries were studded with small (3 to 4 mm in diameter) greenish cysts. The left ovary was removed and placed in formalin. There was clear mucous in the vagina. The bladder contained watery, yellow urine. The mammary glands were not enlarged and did not contain milk. No parasites were found in the mammary gland ducts.

The head was removed and partially flensed. The left eye was removed, inspected, and preserved in formalin. The brain was assumed to be too decomposed to collect. No parasites were noted in the nasal sinuses.

4. CONCLUSIONS: (possible cause of death, apparent health of the animal, etc.)

The animal did not appear to be emaciated, as exhibited by the thickness of the blubber layer. The animal had eaten recently, but adhesions in the gastrointestinal tract probably indicate healing injuries or irritation in that area. The stomach and colon were not found to be perforated. The nodules and the black spots in the lung were possibly indicative of parasitic infection and/or illness. The nodules found on the ovaries were also abnormal. The skin lesions also were indicative of an as yet unnamed condition, and have been observed in other stranded animals of this species. It is evident from the numerous abnormalities in this animal that it was quite ill, but the primary cause of death was not determined. It is hoped that the numerous tissues collected for histopathological analysis will shed light on the causative agent in this animal's death.

5. SAMPLES RETAINED:

Chas. Ref. #	Sample type	Use code	Disposition/storage
MM2-37-1	lesion from ventral area of tail stock	h	f
MM2-37-2	lesion from left side of tail stock	h	f
MM2-37-3	lesions from tongue	h	f
MM2-37-4	blubber	t	z
MM2-37-5	section of r. lung with black spots	h	f
MM2-37-6	lymph node from r. lung	h	f
MM2-37-7	parasite from r. lung	h	f
MM2-37-8	section of heart	h	f
MM2-37-9	liver	t	z
MM2-37-10	liver	h	f
MM2-37-11	stomach	l	z
MM2-37-12	spleen	h	f
MM2-37-13	r. kidney	t	z
MM2-37-14	section of r. kidney	h	f
MM2-37-15	adrenals (left is tagged)	h	f
MM2-37-16	l. ovary	h	f
MM2-37-17	reproductive tract	l	z
MM2-37-18	whole head	s	z
MM2-37-19	l. eye	h	f
MM2-37-20	first 4 ribs	t,s	z
MM2-37-21	first 4 thoracic vertebrae	t,s	z
MM2-37-22	ectoparasites from tail stock	h	f

Key to use codes:
f=preserved in formalin; z=frozen; b=biochemical analysis; h=histopathology; l=life history; t=toxicology; s=skeletal archive

DEPARTMENT OF DEFENSE
ARMED FORCES INSTITUTE OF PATHOLOGY
WASHINGTON, DC 20306-6000

REPLY TO ATTENTION OF

PATIENT IDENTIFICATION		PLEASE USE AFIP ACCESSION NUMBER IN ALL CORRESPONDENCE
AFIP ACCESSION NUMBER: 2416201-8	CHECK DIGIT:	SEQUENCE: 00
NAME: ANIMAL, CETACEA DOLPHIN SC93-19 T DR BRINSON	SSAN:	
SURGICAL/AUTOPSY PATH ACCESSION #'S		
PLEASE INFORM US OF ANY PATIENT IDENTIFICATION ERRORS		

TPL/MDG/dyj

Dr. Elizabeth Brinson
National Marine Fisheries Service
217 Ft. Johnson Road
Charleston, SC 29412

DATE: 9 November 1993

CONSULTATION REPORT ON CONTRIBUTOR MATERIAL

AFIP DIAGNOSIS:

SC93-19 1. Skin, tail stock: Dermatitis, necroulcerative, suppurative and histiocytic, multifocal, moderate to severe, with ciliated protozoa, Atlantic bottlenose dolphin (Tursiops truncatus), cetacean.
2. Tongue: Glossitis, necroulcerative, focally extensive, moderate, with superficial mixed bacteria.
3. Lymph node, lung associated: Anthracosis, multifocal, moderate.
4. Lung: Metazoan parasite, focal.
5. Liver: Extramedullary hematopoiesis, diffuse, moderate.
6. Ovary: Corpora albicantia, multiple.

COMMENT: We are unable to determine the cause of death based on the submitted material. Postmortem autolysis hampered histopathologic interpretation of some tissues. We have found dermatitis associated with ciliated protozoa to be a fairly common lesion in stranded bottlenose dolphins. We suspect that the protozoa are secondary invaders in wounds initiated by other causes. The cause of the ulcerative lesion in the tongue was not apparent. A poorly preserved metazoan parasite was present in the lung. We did not find parasites associated with the skin lesions. The hepatic extramedullary hematopoiesis probably represents a response to the inflammatory lesions in the skin and tongue. The section of ovary examined appeared inactive and contained corpora albicantia.

TPLipscomb

THOMAS P. LIPSCOMB, DVM
MAJOR, VC, USA
Chief, Division of Veterinary Pathology

CHARLESTON LABORATORY
FORENSICS PROJECT
NECROPSY NOTES

DATE: 5/17/93

SPECIES AND SEX: *Tursiops truncatus* male

LOCATION AND DATE OF STRANDING: Bohicket Creek, Charleston Co., 5/15/93

SEUS STRANDING NETWORK INFORMATION: SC-93-20

LOCATION OF NECROPSY: NMFS Charleston Laboratory

LEVEL A DATA COLLECTED BY: K. Moore, G. Mitchum, G. Seaborn

NECROPSY TEAM MEMBERS: K. Moore, G. Mitchum, G. Seaborn, E. Brinson

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NECROPSY NOTES

1. GENERAL COMMENTS: (Include species, total length, sex, whether single or multiple occurrence, condition code, exact location of stranding, air and water temperature, other weather conditions.)

The 166 cm male bottlenose dolphin was found floating dead in Bohicket Creek (between Wadmalaw Island and John's Island) the night of 5/15/93. The animal was brought to Bohicket Marina and iced down until the morning of 5/16/93, when NMFS personnel collected it and brought it to NMFS Charleston Laboratory. It was refrigerated at NMFS until necropsy the morning of 5/17/93. The animal was a code 2 at the time of necropsy.

2. EXTERNAL OBSERVATIONS: (Include estimated maturity of animal, presence or absence of ectoparasites, lesions, apparent trauma or bruising, scar patterns, signs of decomposition, fisheries interaction indicators, damage due to scavengers. Examine and comment on eyes, mouth, teeth, blowhole, anal and genital slits.)

The animal was immature. The teeth were fully erupted and unworn. No ectoparasites were noted on the skin or in the blowhole, anal slit, genital slit, eyes, or mouth. There were lesions on the skin. One pinhole lesion was noted; other lesions were open sores (exposing the blubber layer) no more than 2 cm in diameter. The lesions were not as numerous or as large as the ones observed in other recently stranded animals (SC-93-19, SC-

93-17). There were no lesions in the mouth, and the tongue was not bloated. There was one set of tooth rake marks on the animal's left lateral side, anterior to and above the genital slit. There was no evidence of bruising, but there were several shallow (not penetrating into the blubber) abrasions and cuts all over the animal. Thin sheets of skin were just beginning to rub off, but the skin was not buckling or peeling in sheets. The animal was not bloated.

3. INTERNAL OBSERVATIONS:

The mid-dorsal blubber thickness was 18 mm, mid-lateral was 17 mm, and mid-ventral was 23 mm. The primary incision was made through the blubber and muscle layers just anterior to the insertion of the right flipper. The head was removed by disarticulating the skull from the first vertebra. When the bronchial tube was severed, bloody foam came out. The calvarium was removed. The brain was still semi-firm and not at all soupy. It appeared normal in color and shape. The head was partially flensed. Melon and both eyes were collected. When the right eye was slit, it exuded a clear liquid with black soot-like matter suspended in it. The left eye was preserved whole. No parasites were noted in the nasal sinuses. The brain was frozen in the skull for later sampling for enzyme activity. After the head had been in the freezer for several hours, it was briefly removed to collect a section of brain for histopathology before it froze.

A second dorsal-to-ventral incision was made through the blubber layer at the axilla of the right flipper, and then along the ventral midline to the genital slit. The right flipper was disarticulated and removed, and the blubber covering the thoracic cavity was dissected away in windows. The blubber was pink and very firm. The fat pad between the vascular layer under the blubber and the muscle was noticeable only within six to eight cm of the dorsal midline. The fat pad was absent along the lateral and ventral sides. No parasites were noted in the blubber layer or the muscle.

Two lesions were collected in formalin from the skin/blubber just below the dorsal fin on the animal's right side. The lesions were about 1 cm in diameter and had penetrated into the blubber layer. There was a grey necrotic area in the blubber under the lesions.

The right scapula was removed. A lymph node from the area of the scapula was preserved in formalin. The ribs were disarticulated from the sternum and from the vertebral column and removed to expose the body cavity. The right lung was mottled bright pink and dark purple with some dark grey spots (5 to 7 mm in diameter). It was spongy, somewhat lumpy, and had a wrinkled appearance. A section of the lung was preserved in formalin. The section revealed that the dorsal part of the lung contained bloody foam, and the ventral area of the lung contained a creamy yellowish foam. The left lung contained more hardened cysts than the right lung. The left lung also contained bloody foam in the dorsal half and yellowish foam in the ventral half. A lymph node was removed from the left lung and placed in formalin.

The heart was removed and examined. Major vessels surrounding the heart were clear of obstruction. No parasites were found inside the chambers. The walls of right ventricle were unusually thick (2.5 cm). The liver appeared normal in color and shape.

The stomach was tied off at the esophageal and intestinal ends and removed whole. Contents will be examined by Dr. Dan Odell's lab. The stomach felt full, and the abdomen of a shrimp was removed from the esophagus. There were mild adhesions around the stomach. The walls of the upper intestine were coated with a bright yellow viscous fluid. There were

hard, grainy, clay-like particles scattered throughout most of the length of the intestine. Near the anus, the inner intestinal walls were lightly speckled with very small (1 mm) green spots, and the walls were coated with a light grey-green viscous fluid.

The spleen was normal in color, but was enlarged and somewhat lumpy. The adrenals were inspected and removed. They appeared normal in color and shape. The kidneys were purplish and firm, and showed no outward signs of decomposition.

The testes were oblong and off-white. They were sectioned and placed in formalin. As the incision along the ventral midline of the animal was extended to the anal slit, a small amount of yellow pus-like liquid was encountered. It was not clear what the source of the liquid was; it appeared to be an isolated pocket. It was determined that the liquid had not come from the rectum or the bladder.

The first four ribs and the last four thoracic vertebrae were removed. An unusual growth pattern was noted between the 7^{th} and 8^{th} thoracic vertebrae and between the 11^{th} and 12^{th} thoracic vertebrae. The 7^{th} and 8^{th} thoracic vertebrae were removed from the spine and separated from each other. Between these vertebrae, at the location of disc attachment, the vertebrae were not round. A section of spine in the tail stock was removed and flensed, and the vertebrae there seemed to be asymmetrical, also. All of these vertebrae were preserved.

4. CONCLUSIONS: (possible cause of death, apparent health of the animal, etc.)

The animal had eaten recently. The lumps in the lungs were probably due to encysted parasites which are not uncommon in stranded *Tursiops*. The foam in the lungs indicated rapid respiration before death, and the yellowish coloration of the foam may have been indicative of infection. The thickened wall of the right ventricle may have been due to a chronic circulation problem that would have forced the ventricle to work harder. The abnormalities along the spine could have been congenital defects. The lesions on the skin were indicative of an as-yet unnamed condition, and have been seen in other animals of this species. The primary cause of death was not determined. It is hoped that the numerous tissues collected for histopathological analysis will shed light on the causative agent in this animal's death.

5. SAMPLES RETAINED:

Chas. Ref. #	Sample type	Use code	Disposition/storage
MM2-38-1	whole head	l,s,b	z
MM2-38-2	l. eye	h	f
MM2-38-3	r. eye	h	f
MM2-38-4	skin lesions from l. of blowhole	h	f
MM2-38-5	melon	b	z
MM2-38-6	blubber	t	z
MM2-38-7	lesions from below dorsal fin	h	f
MM2-38-8	lymph node from r. scapula	h	f
MM2-38-9	section of r. lung	h	f
MM2-38-10	whole heart	h	f
MM2-38-11	lymph node from l. lung	h	f
MM2-38-12	section of liver	h	f
MM2-38-13	liver	t	z
MM2-38-14	section of spleen	h	f
MM2-38-15	whole stomach	l	z
MM2-38-16	adrenals (l. is tagged)	h	f
MM2-38-17	kidneys	t	z
MM2-38-18	section of r. kidney	h	f
MM2-38-19	section of l. lung	h	f
MM2-38-20	testes (l. is tagged)	h,l	f
MM2-38-21	first 4 ribs	s,t	z
MM2-38-22	section of lower intestine	h	f
MM2-38-23	last 4 thoracic vertebrae	s,t	z
MM2-38-24	asymmetrical vertebrae	s	z
MM2-38-25	section of brain (r. cerebrum)	h	f

Key to Use codes:
f=preserved in formalin; z=frozen; b=biochemical analysis; h=histopathology; l=life history; t=toxicology; s=skeletal archive

DEPARTMENT OF DEFENSE
ARMED FORCES INSTITUTE OF PATHOLOGY
WASHINGTON, DC 20306-6000

REPLY TO ATTENTION OF

PATIENT IDENTIFICATION		PLEASE USE AFIP ACCESSION NUMBER IN ALL CORRESPONDENCE
AFIP ACCESSION NUMBER	CHECK DIGIT	SEQUENCE
2416202-6		00
NAME		SSAN
ANIMAL, CETACEAN DOLPHIN SC-93-20 T DR BRINSON		
SURGICAL/AUTOPSY PATH ACCESSION #'S		
PLEASE INFORM US OF ANY PATIENT IDENTIFICATION ERRORS		

RKH/TPL/FQF/dyj

National Marine Fisheries Service
217 Ft. Johnson Road
Charleston, SC 29412

DATE: 5 October 1993

CONSULTATION REPORT ON CONTRIBUTOR MATERIAL

AFIP DIAGNOSIS: SC-93-20 1. Lung: Congestion and intraalveolar edema, diffuse, moderate, Atlantic bottlenose dolphin (Tursiops truncatus), cetacean.
2. Lung: Pneumonia, interstitial, chronic, multifocal, mild, with mineralized granulomas.
3. Spleen, white pulp: Lymphoid depletion, diffuse, mild to moderate.
4. Liver: Hepatitis, portal and random, subacute, multifocal, mild.
5. Lymph node, cortex, hilar and right scapular: Lymphoid depletion, diffuse, mild.
6. Skin, multiple sites: Necrosis, dermal, peracute, with ulceration.

Comment: The description of abundant bloody foam exuding from airways combined with the histopathologic findings of pulmonary congestion and edema are compatible with death caused by drowning. We are unable to determine the reason the animal drowned. The chronic interstitial pneumonia and the mineralized granulomas were probably caused by parasitism. Mild lymphoid depletion of and spleen and lymph nodes is a common, nonspecific finding in dolphins. The cause of the hepatitis was not evident. It is considered an incidental finding and of no clinicopathologic significance. The skin lesions occurred a short time prior to death; their cause is not apparent.

Thank you for submitting this interesting case to the Registry of Veterinary Pathology.

RICHARD K. HARRIS, DVM
LtCol, USAF, BSC
Chairman, Department of
Veterinary Pathology

THOMAS P. LIPSCOMB, DVM
MAJOR, VC, USA
Department of Veterinary Pathology

CHARLESTON LABORATORY
FORENSICS PROJECT
NECROPSY NOTES

DATE: June 21, 1993

SPECIES AND SEX: *Tursiops truncatus*

LOCATION AND DATE OF STRANDING: Sullivan's Island - Station 11; 06-21-93

SEUS STRANDING NETWORK INFORMATION: SC-93-24; assigned MM2-43

LOCATION OF NECROPSY: NMFS Charleston Laboratory

LEVEL A DATA COLLECTED BY: Wayne McFee, Ann Colbert

NECROPSY TEAM MEMBERS: Wayne McFee, Ann Colbert

NECROPSY NOTES

1. GENERAL COMMENTS: (Include species, total length, sex, whether single or multiple occurrence, condition code, exact location of stranding, air and water temperature, other weather conditions.)

A 104 cm, code 2, male, newborn bottlenose dolphin was reported stranded on Sullivan's Island in the vicinity of Station 11 at approximately 2:00 PM on June 21, 1993. The specimen was moved to a residence near Station 13, and was kept in the shade in a raft full of water until it was retrieved for necropsy. This dolphin was the only stranding reported on June 21. The air temperature was approximately 90°F, and skies were somewhat cloudy. It should be noted that a single-species fish kill occurred during the night of the 21st and morning of the 22nd. Over 1,000 croaker, size range 6-8" in length, were found dead on the beach in the same location, and for some distance south. No other species were reported to have been involved. The dolphin was extremely fresh and appeared to have died within the last couple of hours.

2. EXTERNAL OBSERVATIONS: (Include estimated maturity of animal, presence or absence of ectoparasites, lesions, apparent trauma or bruising, scar patterns, signs of decomposition, fisheries interaction indicators, damage due to scavengers. Examine and comment on eyes, mouth, teeth, blowhole, anal and genital slits.)

The dolphin was very young. Teeth were beginning to erupt on the upper jaw, but not on the lower jaw. The umbilicus was healed. The eyes were very clear, not cloudy. There were a number of lesions on the exterior surface. Three pinhole lesions were on the body (one on the flukes, one on the right flipper, and one behind the dorsal fin mid-laterally). The hair follicles on the snout were infected with what appeared to be a yellowish granular circular substance embedded in the skin. Similar lesions were on the flukes and right flipper. There were several healed rake-marks on each side below the dorsal fin. Traces of mustard-colored fluid were around the anus. The genital slit appeared clear and free of any parasites or lesions. No bruises or broken bones were apparent, and the flukes, dorsal fin, and flippers were in excellent condition except for the small lesions which were collected in formalin. There was no indication of fishery or other human interaction, and the carcass had not been discovered by scavengers.

3. INTERNAL OBSERVATIONS:

Primary incision (Note condition/thickness of skin, blubber, vascular layer under blubber, fat pad, muscle, mammary glands, peritoneum, gross observations of viscera. Open and examine mammary gland ducts for nematodes)

Primary incisions were made from the dorsal to ventral areas, forward of the right flipper. The right flipper was removed. There was a healthy fat pad near the head above the right flipper. Blood was collected from the heart and was sent for veterinary screening. The muscle layer was extremely thin. The right lung was puffy and was fully loaded with lungworms. The infestation fully blocked nearly all passages from the bronchial tube into the lung and throughout the lung. Samples of the parasites were collected in formalin. A sample of the lung tissue was also collected in formalin, while the remainder of the right lung was frozen. The right pulmonary lymph node was collected in formalin. Blood was drawn from the heart and was sent for analysis. The whole heart was removed, examined, and placed in formalin. No parasites were visible, and the heart appeared normal in size, shape, and color. The liver appeared normal in color and size. A sample of the liver was placed in formalin, and the remainder of the liver was frozen. The spleen was normal in color, but appeared to be greatly enlarged. The stomach complex was removed, with both ends tied-off, and was frozen whole. The stomach complex felt as though it contained only fluid. The intestine was examined. No parasites were identifiable in the fluid, which was mustard-colored at the anal end and green at the pyloric end. Both adrenal glands were collected in formalin. The kidneys were greenish-brown in color, but appeared normal in size and shape. A sample was removed and placed in formalin. Both kidneys were collected and frozen. Both testes were removed and placed in formalin. Urine

was collected from the bladder for analysis. The urine appeared to be normal in color and consistency. No parasites were present in the air sinuses or blowhole.

4. CONCLUSIONS: (possible cause of death, apparent health of the animal, etc.)

It appears that the cause of death was the severe infestation of lungworms. All air passages were blocked with masses of worms. It has not been determined whether the severe loading was due to immune deficiency of some type. A full sample regime was collected for transfer to the Armed Forces Institute of Pathology for histopathological examination.

5. SAMPLES RETAINED:

CHAS REF #	Sample Type	Use Code	Storage
MM2-43-1	rt. adrenal	h	f
MM2-43-2	spleen	h	f
MM2-43-3	heart	h	f
MM2-43-4	section of liver	h	f
MM2-43-5	exterior lesions	h	f
MM2-43-6	r. pulmonary lymph node	h	f
MM2-43-7	l. and r. testis	h	f
MM2-43-8	r. piece of lung	h	f
MM2-43-9	l. adrenal	h	f
MM2-43-10	r. eye	h	f
MM2-43-11	lung parasites	h	f
MM2-43-12	l. kidney	b	z
MM2-43-13	r. kidney	b	z
MM2-43-14	muscle	i	z
MM2-43-15	stomach complex	l	z
MM2-43-16	r. lung w/ parasites	h	z
MM2-43-17	liver	t	z
MM2-43-18	brain	b	z
MM2-43-19	melon	b	z
MM2-43-20	blubber	t	z
MM2-43-21	whole blood	d	z
MM2-43-22	piece of r. kidney	h	f
MM2-43-23	heart tissue	h	f

Key to Use codes:
f=preserved in formalin; z=frozen; b=biochemical analysis; h=histopathology; l=life history; t=toxicology; s=skeletal archive; i=IEF; d=DNA

DEPARTMENT OF DEFENSE
ARMED FORCES INSTITUTE OF PATHOLOGY
WASHINGTON, DC 20306-6000

REPLY TO ATTENTION OF

PATIENT IDENTIFICATION		PLEASE USE AFIP ACCESSION NUMBER IN ALL CORRESPONDENCE
AFIP ACCESSION NUMBER	CHECK DIGIT	SEQUENCE
2416222-4		00
NAME	SSAN	
ANIMAL, CETACEA DOLPHIN SC93-24 T DR BRUNSON		
SURGICAL/AUTOPSY PATH ACCESSION #'S		
PLEASE INFORM US OF ANY PATIENT IDENTIFICATION ERRORS		

RKH/TPL/WDF/dyj

~~E. Elizabeth Brinson~~
National Marine Fisheries Service
217 Ft. Johnson Road
Charleston, SC 29412

DATE: 8 September 1993

CONSULTATION REPORT ON CONTRIBUTOR MATERIAL

AFIP DIAGNOSIS: SC93-24 1. Lung: Pneumonia, histiocytic, subacute, multifocal to coalescing, moderate, with adult and larval metastrongyle parasites, Atlantic Bottlenose Dolphin (Tursiops truncatus), cetacean, etiology--consistent with Halocercus lagenorhynchi.
2. Skin: Dermatitis, subacute, multifocal, mild, with epidermal amphophilic to eosinophilic intranuclear inclusion bodies.
3. Skin: Dermatitis, necrotizing, subacute, multifocal to coalescing, moderate, with ciliated protozoa.
4. Heart, epicardium: Epicarditis, subacute, multifocal, minimal.
5. Pulmonary lymph node: Histiocytosis, diffuse, moderate, with edema.

COMMENT: The histopathologic findings support your interpretation that verminous pneumonia was the most significant factor in the death of this neonatal dolphin. Another very interesting lesion is the dermatitis associated with the presence of intranuclear inclusion bodies within epidermal cells. These inclusions suggest the possibility of a viral infection. Additional testing will be done in an attempt to confirm a viral etiology, and an addendum report will be sent to you. Another skin specimen had dermatitis associated with the presence of ciliated protozoa within the dermis. We have found ciliated protozoal dermatitis to be a relatively common infection of stranded free-living dolphins. We suspect that the protozoa are secondary invaders in wounds initiated by other mechanisms.

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WASHINGTON, DC 20306-6000

REPLY TO ATTENTION OF

PATIENT IDENTIFICATION		PLEASE USE AFIP ACCESSION NUMBER IN ALL CORRESPONDENCE
AFIP ACCESSION NUMBER	CHECK DIGIT	SEQUENCE
2416222-4		00
NAME		SSAN
ANIMAL, CETACEA DOLPHIN SC93-24 T DR BRUNSON		
SURGICAL/AUTOPSY PATH ACCESSION #'S		
PLEASE INFORM US OF ANY PATIENT IDENTIFICATION ERRORS		

TPL/WDF/dvj

Dr. Elizabeth Brunson
National Marine Fisheries Service
217 Ft. Johnson Road
Charleston, SC 29412

DATE: 9 November 1993

CONSULTATION REPORT ON CONTRIBUTOR MATERIAL

AFIP DIAGNOSIS:

ADDENDUM REPORT

SC93-24 1. Lung: Pneumonia, histiocytic, subacute, multifocal to coalescing, moderate, with adult and larval metastrongyle parasites, Atlantic Bottlenose Dolphin (Tursiops truncatus), cetacean, etiology--consistent with Halocercus lagenorhynchi.
2. Skin: Dermatitis, subacute, multifocal, mild, with epidermal amphophilic to eosinophilic intranuclear inclusion bodies.
3. Skin: Dermatitis, necrotizing, subacute, multifocal to coalescing, moderate, with ciliated protozoa.
4. Heart, epicardium: Epicarditis, subacute, multifocal, minimal.
5. Pulmonary lymph node: Histiocytosis, diffuse, moderate, with edema.

COMMENT: Immunoperoxidase testing of skin sections that contain intranuclear inclusion bodies suggestive of viral infection failed to identify morbillivirus or herpesvirus antigen. Thus, the cause of the inclusion bodies is undetermined.

THOMAS P. LIPSCOMB, DVM
MAJOR, VC, USA
Chief, Division of Veterinary Pathology

2416222-4
ANIMAL, CETACEA DOLPHIN
SC93-24 T DR BRUNSON

The pulmonary lymph node with histiocytosis was draining the lung affected with histiocytic pneumonia.

RICHARD K. HARRIS, DVM
LtCol, USAF, BSC
Chairman, Department of
Veterinary Pathology

THOMAS P. LIPSCOMB, DVM
MAJOR, VC, USA
Department of Veterinary Pathology

CHARLESTON LABORATORY
FORENSICS PROJECT
NECROPSY NOTES

DATE: June 24,1993

SPECIES AND SEX: *Stenella frontalis*

LOCATION AND DATE OF STRANDING: Taken incidentally in commercial gill net

SEUS STRANDING NETWORK INFORMATION: WH-01951; assigned MM1-72(A)

LOCATION OF NECROPSY: NMFS Charleston Laboratory

LEVEL A DATA COLLECTED BY: Wayne McFee, Ann Colbert, Elizabeth Brinson

NECROPSY TEAM MEMBERS: Wayne McFee, Ann Colbert, Elizabeth Brinson

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NECROPSY NOTES

1. GENERAL COMMENTS: (Include species, total length, sex, whether single or multiple occurrence, condition code, exact location of stranding, air and water temperature, other weather conditions.)

This 179 cm, code 2, female, spotted dolphin is one of six animals obtained from Bill Bowen (NMFS-Beaufort) and was incidentally taken by a commercial vessel with a gill net in waters off New England. It was assigned a Woods Hole number, then transferred to Beaufort. This animal was stored in the walk-in freezer A at the Charleston Laboratory to be used in a training session. The dolphin was still fresh and was discovered during necropsy to be pregnant.

2. EXTERNAL OBSERVATIONS: (Include estimated maturity of animal, presence or absence of ectoparasites, lesions, apparent trauma or bruising, scar patterns, signs of decomposition, fisheries interaction indicators, damage due to scavengers. Examine and comment on eyes, mouth, teeth, blowhole, anal and genital slits.)

The dolphin was a mature adult female. The exterior surface appeared to be clear of parasites and lesions, though skin was beginning to slough off. A fin clip was taken and frozen for Gordon Waring, Woods Hole. Eyes appeared normal. Possible parasite eggs were found in blowhole. Teeth were counted and determined to be 34 left upper, 34 right upper, 33 left lower, and 33 right lower. Probing the genital slit to determine sex was not possible because of a blockage, possibly due to pregnancy as determined later. There was no evidence of scavengers since this animal was taken in fisheries interaction.

3. INTERNAL OBSERVATIONS:

Primary incision (Note condition/thickness of skin, blubber, vascular layer under blubber, fat pad, muscle, mammary glands, peritoneum, gross observations of viscera. Open and examine mammary gland ducts for nematodes)

The blubber layer was checked at three different regions: mid-dorsal 1cm., mid-lateral 0.7cm, and mid-ventral 0.6cm. Primary incisions were made dorsal to ventral anterior to the right flipper. The right flipper and scapula were removed. The animal had no significant fat pad to go along with a thin blubber layer. Parasitic cysts were found in muscle layer as well as in the blubber. The right lung appeared hemmorhagic and had a lumpy exterior. Fluid from the lung was taken. The lymph node from the right lung was collected and appeared normal. The liver was abnormal and discolored. At this point it was discovered that the animal was pregnant, and since other organs were still somewhat frozen, the uterus was opened to expose the fetus. It should be noted that while extraction of the fetus was taking place, water was allowed to flow over other organs to speed the thawing process. Amniotic fluid was collected in tubes. The umbilical chord was loaded with parasites and nodules. A sample was collected. The fetus appeared very red in color on the ventral surface. The fetus was determined to be a male. A parasite and cyst were found ventrally of the uterus. The fetus was removed along with the reproductive tract. Two nalgene tubes of blood were collected from the body cavity at this point. The heart was checked and blood collected. The heart appeared normal and clear of parasites. Adrenals were removed from both kidneys. Kidneys appeared slightly discolored and were collected whole. The spleen appeared enlarged and was collected whole. The esophagus was cut near the stomach complex and revealed a piece of food which was collected. The stomach complex was removed and tied off, and appeared full at time of death. Adhered to the stomach was a series of large tumor-like nodules. The nodules remained attached to the stomach complex. The intestinal tract was inspected and contained large quantities of gritty dirt material along with a pasty brownish mucosal substance. The head was disarticulated and flensed to remove the brain. Air sinuses contained parasites and eggs. A section of the

right and left cerebrum was removed and frozen. The brain was beginning to turn yellow and slightly mushy. The eyes were examined and appeared normal.

4. **CONCLUSIONS:** (possible cause of death, apparent health of the animal, etc.)

The cause of death of this animal was determined to be from human interaction specifically a commercial net fishery off the New England coast. It is therefore not apparent what role the heavy infestation of parasites would have played had the animal not been taken in the fishery. The parasite samples and the nodules were collected for transfer to the Armed Forces Institute of Pathology for histopathological examination. Since the entire animal had been frozen, histopath analysis of the routinely collected organ samples will not be possible.

5. **SAMPLES RETAINED:**

CHAS REF #	Sample Type	Use Code	Storage
MM1-72(A)-1	Dorsal fin clip	l	z
MM1-72(A)-2	parasite muscle,ventral	h	f
MM1-72(A)-3	blubber	t	z
MM1-72(A)-4	muscle	t	z
MM1-72(A)-5	parasite,muscle, mid lateral	h	f
MM1-72(A)-6	Abnormal r. lung tissue	h	f
MM1-72(A)-7	r. lymph node	h	f
MM1-72(A)-8	Abnormal r. lung tissue	h	f
MM1-72(A)-9	Part of r. lung	h	z
MM1-72(A)-10	Abnormal liver tissue	h	f
MM1-72(A)-11	liver tissue	h	z
MM1-72(A)-12	Amniotic fluid	l	z
MM1-72(A)-13	Umbilical chord	h	f
MM1-72(A)-14	unk. tissue, ventral to uterus	h	f
MM1-72(A)-15	uterine parasite and cyst	h	f
MM1-72(A)-16	repro. tract	l	z
MM1-72(A)-17	2 tubes blood	d	z
MM1-72(A)-18	lung fluid		z
MM1-72(A)-19	Heart blood	d	z
MM1-72(A)-20	whole heart	h	z
MM1-72(A)-21	l. adrenal	h	f
MM1-72(A)-22	r. adrenal	h	f
MM1-72(A)-23	l.kidney	h,t	z
MM1-72(A)-24	r.kidney	h,t	z

MM1-72(A)-25	spleen	h	f
MM1-72(A)-26	liver	h,t	z
MM1-72(A)-27	food from esophagus	l	a
MM1-72(A)-28	stomach complex	l	z
MM1-72(A)-29	"tumors" adhered to stomach	h	f
MM1-72(A)-30	head	s	z
MM1-72(A)-31	melon	b	z
MM1-72(A)-32	sinus parasites	h	f
MM1-72(A)-33	l. eye	h	f
MM1-72(A)-34	r. lobe of cerebrum	b	z
MM1-72(A)-35	l. lobe of cerebrum	b	z

Key to Use codes:
f=preserved in formalin; z=frozen; b=biochemical analysis; h=histopathology; l=life history; t=toxicology; s=skeletal archive

DEPARTMENT OF DEFENSE
ARMED FORCES INSTITUTE OF PATHOLOGY
WASHINGTON, DC 20306-6000

REPLY TO ATTENTION OF

PATIENT IDENTIFICATION		PLEASE USE AFIP ACCESSION NUMBER IN ALL CORRESPONDENCE
AFIP ACCESSION NUMBER	CHECK DIGIT	SEQUENCE
2423047-6		00
NAME		SSAN
ANIMAL, CETACEA DOLPHIN MM1-72 T DR JENNINGS		
SURGICAL/AUTOPSY PATH ACCESSION #'S		
PLEASE INFORM US OF ANY PATIENT IDENTIFICATION ERRORS		

TPL/FQF/dyj

Dr. Ann Jennings
NMFS - Charleston Laboratory
P.O. Box 12607
217 Fort Johnson Road
Charleston, SC 29422

DATE: 19 November 1993

CONSULTATION REPORT ON CONTRIBUTOR MATERIAL

AFIP DIAGNOSIS: MM1-72(A) 1. Skeletal muscle: Granulomas, multifocal, spotted dolphin (Stenella frontalis), cetacean.
2. Skin: Granuloma, focal.
3. Spleen: Hyperplasia, lymphoid, mild.
4. Fibroadipose tissue near uterus (per contributor): Parasitic cyst with larval cestode.
5. Lymph node, capsular lymphatic vessel: Nematode parasite, intraluminal.

Comment: Freeze artifact hampered histological interpretation of the submitted tissues. The history of being caught in a gill net indicates drowning as the likely cause of death. Special stains of the granulomas found in the skeletal muscle and skin failed to identify microorganisms. These lesions may have been caused by parasites. No parasites were found in the umbilical cord.
Thank you for submitting this interesting case to the Registry of Veterinary Pathology.

THOMAS P. LIPSCOMB, DVM
MAJOR, VC, USA
Chief, Division of Veterinary Pathology

CHARLESTON LABORATORY
FORENSICS PROJECT
NECROPSY NOTES

DATE: July 8, 1993

SPECIES AND SEX: *Tursiops truncatus*; Female

LOCATION AND DATE OF STRANDING: Colleton River, Waddell Mariculture Center Bluffton; 07-08-93

SEUS STRANDING NETWORK INFORMATION: SC-93-26; assigned MMES 93-01-SC

LOCATION OF NECROPSY: NMFS Charleston Laboratory

LEVEL A DATA COLLECTED BY: Wayne McFee, Kathy Moore, Elisabeth Brinson

NECROPSY TEAM MEMBERS: Wayne McFee, Kathy Moore, Pat Fair, Elisabeth Brinson

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NECROPSY NOTES

1. GENERAL COMMENTS: (Include species, total length, sex, whether single or multiple occurrence, condition code, exact location of stranding, air and water temperature, other weather conditions.)

A 227 cm, code 2, female, adult bottlenose dolphin was reported as dead and being pushed around by two other dolphins in the vicinity of the Waddell Mariculture Center, Bluffton, S.C. on the Colleton River at approximately 0830 am on July 8, 1993. The animal was towed by a SCWMRD employee to a dock at the Center and left in the water where the two dolphins continued to circle for about two more hours. Water temperature was approximated at 84 degrees F, air temperature at 95 degrees F, and weather conditions sunny. Pat Fair (Charleston Laboratory) and Sally Murphy were on scene until it was decided to transport the animal to the Charleston Laboratory for necropsy. The animal was loaded into a pick-up truck, covered with ice and plastic, and transported to the Lab. Upon arrival at the Lab at 7:00 pm, the animal was a mid-code 3. Necropsy followed immediately. This animal was the only one reported for July 8.

2. EXTERNAL OBSERVATIONS: (Include estimated maturity of animal, presence or absence of ectoparasites, lesions, apparent trauma or bruising, scar patterns, signs of decomposition, fisheries interaction indicators, damage due to scavengers. Examine and comment on eyes, mouth, teeth, blowhole, anal and genital slits.)

The dolphin was an adult female. The exterior surface appeared to be clear of parasites. Circular, discolored lesions were discovered on the mid-lateral right side of the tail stock and preserved in formalin. These lesions did not have a pin-hole appearance. There was a puncture wound mid-ventral between the flippers, 63 cm from the tip of the snout, approximately 1.7 cm in length, which extended into the body cavity. A large quantity of blood was flowing from this wound. This wound strongly suggests the role of fisheries interaction. Rake marks were extensive on the head and ventral on the left flipper. The animal was bloated. The genital slit was swollen and green in color. Eyes appeared normal. There was no evidence of parasites in the blowhole. Teeth were slightly worn. The teeth were counted and determined to be 22 left upper, 21 right upper, 20 left lower, and 21 right lower. There was no evidence of scavengers.

3. INTERNAL OBSERVATIONS:

Primary incision (Note condition/thickness of skin, blubber, vascular layer under blubber, fat pad, muscle, mammary glands, peritoneum, gross observations of viscera. Open and examine mammary gland ducts for nematodes)

The blubber layer was checked at three different regions: mid-dorsal 14 mm, mid-lateral 8 mm, and mid-ventral 10 mm. Primary incisions were made dorsal to ventral anterior to the right flipper, and then anterior to posterior along the ventral midline to the genital slit. The right flipper and scapula were removed. Windows were cut to peel back the blubber layer. There was a slight fat pad layer. No parasites were observed in the blubber layer. The muscle layer was beginning to deteriorate and was slightly discolored. The whole anterior portion of the animal was full of blood. The right lung was slightly hemmorrhagic but was clear of parasites. A section was frozen and a small piece placed in formalin. The pericardial sac was hemmorrhagic as was the surrounding peritoneum. The heart was removed, and a puncture wound was found in the upper left ventricle. The heart appeared normal in size and shape, and appeared clear of parasites. The whole heart was placed in formalin. The gonads were removed and frozen. The stomach was tied off, removed, and frozen. Nodules were observed in the mesentery near the stomach complex. Food particles were removed from the esophagus, suggesting the animal was feeding at the time of death. The remaining organs were not sampled due to severe decomposition. The head was disarticulated, flensed and brain removed. The brain was not saved because of severe decomposition. No parasites were observed in the blowhole or air sinuses. The entire skeleton was placed in Freezer A.

4. CONCLUSIONS: (possible cause of death, apparent health of the animal, etc.)

The animal appeared healthy, although it was difficult to ascertain because of the severe decomposition of major organs. The puncture wound through the chest and into the heart was apparently the cause of death, and suggests fisheries interaction. Extended exposure to hot weather made it difficult to collect tissue samples because of severe decomposition of the tissues, though a small regime was collected. Histopath analysis of the routinely collected organ samples will not be possible.

5. SAMPLES RETAINED:

CHAS REF #	Sample Type	Use Code	Storage
MMES 93-01-SC-1	Skin lesions	h	f
MMES 93-01-SC-2	Blubber	t	z
MMES 93-01-SC-3	Puncture wound	l	f
MMES 93-01-SC-4	Whole heart	l	f
MMES 93-01-SC-5	Piece r. lung	h	f
MMES 93-01-SC-6	Lymph node r. lung	h	f
MMES 93-01-SC-7	Large section of r. lung		z
MMES 93-01-SC-8	Reproductive tract	l	z
MMES 93-01-SC-9	Food particles	l	a
MMES93-01-SC-10	Stomach complex	l	z
MMES93-01-SC-11	R. eye	h	f

Key to Use codes:
f=preserved in formalin; z=frozen; b=biochemical analysis; h=histopathology; l=life history; t=toxicology; s=skeletal archive

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ARMED FORCES INSTITUTE OF PATHOLOGY
WASHINGTON, DC 20306-6000

REPLY TO ATTENTION OF

PATIENT IDENTIFICATION		PLEASE USE AFIP ACCESSION NUMBER IN ALL CORRESPONDENCE
AFIP ACCESSION NUMBER	CHECK DIGIT	SEQUENCE
2423048-4		00
NAME	SSAN	
ANIMAL, CETACEA DOLPHIN MMES93-01 T DR JENNINGS		
SURGICAL/AUTOPSY PATH ACCESSION #'S		
PLEASE INFORM US OF ANY PATIENT IDENTIFICATION ERRORS		

TPL/WDF/dyj

Dr. Ann Jennings
NMFS - Charleston Laboratories
P.O.Box 12607
217 Fort Johnson Road
Charleston, SC 29422

DATE: 9 November 1993

CONSULTATION REPORT ON CONTRIBUTOR MATERIAL

AFIP DIAGNOSIS:

MMES93-01 1. Lung: Pneumonia, interstitial, subacute and eosinophilic, multifocal to coalescing, moderate, with alveolar histiocytosis and edema, Atlantic bottlenose dolphin (Tursiops truncatus), cetacean.
2. Lung associated lymph node: Hyperplasia, lymphoid, follicular, moderate.
3. Lung associated lymph node, medullary sinuses: Necrosis, multifocal, moderate, with granulomatous inflammation.

COMMENT: The necropsy finding of a penetrating wound through the heart is presumed to be the cause of death. The cause of the interstitial pneumonia is not apparent, but the presence of eosinophils suggests parasitism. The areas of necrosis and granulomatous inflammation in the lung associated lymph node are characteristic of migration tracts of larval nematodes, providing further evidence of parasitism. The lymphoid hyperplasia may be in response to parasitism as well.

T P Lipscomb

THOMAS P. LIPSCOMB, DVM
MAJOR, VC, USA
Chief, Division of Veterinary Pathology

CHARLESTON LABORATORY
FORENSICS PROJECT
NECROPSY NOTES

DATE: August 4, 1993

SPECIES AND SEX: *Tursiops truncatus*; Female

LOCATION AND DATE OF STRANDING: Charleston Harbor near south jetty, Charleston, S.C.; 07/31/93

SEUS STRANDING NETWORK INFORMATION:SC 93-30; CRN MMES 93-10-SC

LOCATION OF NECROPSY: NMFS Charleston Laboratory

LEVEL A DATA COLLECTED BY: Wayne McFee and Kathy Moore

NECROPSY TEAM MEMBERS: Wayne McFee and Kathy Moore

NECROPSY NOTES

1. GENERAL COMMENTS: (Include species, total length, sex, whether single or multiple occurrence, condition code, exact location of stranding, air and water temperature, other weather conditions.)

This 146 cm, early code 3, female, immature bottlenose dolphin was discovered floating dead in the vicinity of the south jetty in Charleston Harbor, Charleston, S.C. on Saturday July 31, 1993. It is unknown who discovered the dolphin, or who placed the animal in the SCWMRD's cooler at approximately 40 degrees F on Saturday. Sally Murphy, SCWMRD, alerted Wayne McFee, NMFS, of the dolphin in the cooler on Monday, August 2, 1993. The dolphin was transported from the cooler at the SCWMRD on Ft. Johnson Rd., Charleston, S.C. by truck to the Charleston Laboratory, also on Ft. Johnson Rd., at 1300 for necropsy. Upon arrival at the lab the animal was an early code 3. Necropsy began at 1400. This animal was the only one reported for July 31, 1993. Weather conditions at the time of discovery could not be ascertained.

2. EXTERNAL OBSERVATIONS: (Include estimated maturity of animal, presence or absence of ectoparasites, lesions, apparent trauma or bruising, scar patterns, signs of decomposition, fisheries interaction indicators, damage due to scavengers. Examine and comment on eyes, mouth, teeth, blowhole, anal and genital slits.)

The dolphin was an immature female. Ectoparasites were not observed. One circular, discolored patch of skin was found on the edge of the right flipper and was preserved in formalin. A large, healed shark bite was on the midline, immediately posterior to dorsal fin of the animal. Another scar was observed on the right ventral side of the belly, running dorsal to ventral, approximately 15 cm long, and ending approximately 5 cm anterior to the umbilicus. A large bruised region along the right side surrounding the right flipper and extending to the jaw was observed. There were cuts at the corners of the mouth. There were scratches just posterior to the blowhole. The tip of the left fluke had a circular scar present. Pictures were taken of the above cuts and scrapes. The animal was beginning to bloat. The genital slit appeared normal. Eyes appeared normal. There was no evidence of parasites in the blowhole or air sinuses. The teeth were loose and not worn. The teeth were counted and determined to be 21 left upper, 20 right upper, 20 left lower, and 20 right lower. There was no evidence of scavengers.

3. INTERNAL OBSERVATIONS:

Primary incision (Note condition/thickness of skin, blubber, vascular layer under blubber, fat pad, muscle, mammary glands, peritoneum, gross observations of viscera. Open and examine mammary gland ducts for nematodes)

The blubber layer was checked at three different regions: mid-dorsal 12 mm, mid-lateral 9 mm, and mid-ventral 11 mm. Primary incisions were made dorsal to ventral anterior to the right flipper, and then anterior to posterior along the ventral midline to the genital slit. The right flipper and scapula were removed. A window was cut to peel back the blubber layer. There was no distiguishable fat pad layer. No parasites were observed in the blubber layer. The blubber layer, especially anterior, was spotted with blood. A sample of blubber was collected and frozen. The muscle layer was removed and the ribs pulled back to expose the viscera. A piece of muscle was collected and frozen. The whole anterior of the animal at this time was observed to be severely hemmorrhagic. Blood vessels and capillaries appeared to be enlarged and near the surface of each organ and tissue. The lung was hemmorrhagic. A piece of the right lung was preserved in formalin. The ventral side of the right lung was lumpy with granular growths. Half of the right lung was collected and frozen. A knobby growth was collected from the ventral side of the peritoneum near the heart. The pulmonary lymph node appeared slightly enlarged, and was preserved in formalin. The heart appeared discolored. No parasites were observed in the heart. The heart was collected in formalin. The liver was slightly lumpy and spongy. A piece of the liver was collected and placed in formalin. After the esophagus was severed and tied off, the head was

disarticulated from the rest of the body. No food was present in the esophagus and the stomach felt empty, suggesting that the animal had not eaten prior to death. The liver was removed and the stomach collected. Tumor-like, spongy growths were observed on the ventral side of the stomach near the third chamber. A growth of this sort was removed and placed in formalin. The spleen appeared enlarged and soft, with some nodules attached. The spleen with a nodule were collected and placed in formalin. The texture and size of the kidneys appeared normal, though upon incision appeared slightly bloody. A piece of the left kidney was collected and preserved in formalin, and the both kidneys frozen. Both adrenals were also collected and placed in formalin. The reproductive tract was removed and frozen. Both eyes were removed and preserved in formalin with the right eye being slit. The melon was removed and frozen. The melon was bloody, as was the skull. The skull was opened posteriorly to the occipital condyle to remove the brain. Dr. Mike Fulton, NMFS, removed pieces of the brain for analysis. The brain was very bloody. No fractures were noticed in the skull. The entire skeleton was placed in Freezer A.

4. CONCLUSIONS: (possible cause of death, apparent health of the animal, etc.)

The cause of death is unknown. Healed scars make it apparent that these were old wounds that did not contribute to death. It is suggested that whatever caused the large quantities of blood found throughout the anterior portion of the animal, especially the skull, brain, blubber, and vital organs, could be responsible for the death of the animal. No parasites were found during the necropsy. A small regime of samples were collected for histopath analysis to be sent to the Armed Forces Institute of Pathology.

5. SAMPLES RETAINED:

CHAS REF#	Sample Type	Use Code	Storage
MMES 93-10-SC-1	skin lesion	h	f
MMES 93-10-SC-2	growth-peritoneum	h	f
MMES 93-10-SC-3	blubber	t	z
MMES 93-10-SC-4	muscle	t	z
MMES 93-10-SC-5	lung piece	h	f
MMES 93-10-SC-6	pulmonary lymph node	h	f
MMES 93-10-SC-7	1/2 right lung	t	z
MMES 93-10-SC-8	heart	l	f
MMES 93-10-SC-9	liver piece	h	f
MMES 93-10-SC-10	spleen w/ nodule	h	f
MMES 93-10-SC-11	stomach	l	z

MMES 93-10-SC-12	tumor-like growth	stomach	h	f
MMES 93-10-SC-13	kidneys		t	z
MMES 93-10-SC-14	adrenals (l.tied)		h	f
MMES 93-10-SC-15	l. kidney piece		h	f
MMES 93-10-SC-16	repro tract		l	z
MMES 93-10-SC-17	eyes (r. is slit)		h	f
MMES 93-10-SC-18	melon		t	z
MMES 93-10-SC-19	l. cerebrum piece		h	f
MMES 93-10-SC-20	whole skeleton		s	z

Key to Use codes:
f=preserved in formalin; z=frozen; b=biochemical analysis; h=histopathology; l=life history; t=toxicology; s=skeletal archive

DEPARTMENT OF DEFENSE
ARMED FORCES INSTITUTE OF PATHOLOGY
WASHINGTON, DC 20306-6000

18 January 1995

2423045-0 00
ANIMAL, CETACEAN DOLPHIN
MMES 93-10-SC T DR JENNINGS
TPL/MDG/dyj

Ann Jennings
NMFS-Charleston Laboratory
P.O. Box 12607
217 Fort Johnson Road
Charleston, SC 29422

AFIP DIAGNOSES:

MMES 93-10-SC 1. Lung: Congestion, diffuse, mild, with intra-alveolar edema, bottlenose dolphin (*Tursiops truncatus*), cetacean.
2. Lung: Pneumonia, interstitial, lymphoplasmacytic and eosinophilic, multifocal, mild.
3. Lymph node, lung-associated; lymph node, ventral side of peritoneum near heart: Hyperplasia, lymphoid, mild, with eosinophilic infiltrates.
4. Liver; spleen: Extramedullary hematopoiesis, multifocal, mild to moderate.
5. Brain, cerebrum: Congestion, acute, diffuse, mild.
6. Heart, atrium; skeletal muscle; kidney; adrenal gland: No significant lesions.

COMMENT: We are unable to determine the cause of death from the submitted material. Pulmonary congestion and edema and cerebral congestion are common nonspecific findings in stranded dolphins. Pneumonia of this type is also very common and is probably caused by parasitism, as are the changes in the lymph nodes. Extramedullary hematopoiesis of spleen and liver is common in young dolphins and in dolphins with inflammatory lesions. The tissue described grossly as "a knobby growth... from the ventral side of the peritoneum near the heart" was found to be a mildly hyperplastic lymph node. The tissue described as "tumor-like, spongy growth on ventral side of stomach near third chamber" was severely autolytic but appeared to be liver.

Department of Veterinary Pathology, Building 54, Room G-117, 14th St. and Alaska Ave NW, Washington, DC 20306-6000
Phone: 202-782-2600 DSN: 662-2600 FAX: 202-782-9150 EMAIL: martinez@email.afip.osd.mil

Thank you for submitting this interesting case to the Registry of Veterinary Pathology.

Thomas P. Lipscomb, DVM, DACVP
LTC, VC, USA
Chief, Division of Veterinary
Pathology

CHARLESTON LABORATORY
FORENSICS PROJECT
NECROPSY NOTES

DATE: September 20, 1993

SPECIES AND SEX: *Tursiops truncatus*; Male

LOCATION AND DATE OF STRANDING: Sullivan's Is.; September 16, 1993

SEUS STRANDING NETWORK INFORMATION: SC 93-31; assigned MMES 9316SC

LOCATION OF NECROPSY: NMFS Charleston Laboratory

LEVEL A DATA COLLECTED BY: Wayne McFee, Shawn Layman

NECROPSY TEAM MEMBERS: Wayne McFee, Shawn Layman

NECROPSY NOTES

1. GENERAL COMMENTS: (Include species, total length, sex, whether single or multiple occurrence, condition code, exact location of stranding, air and water temperature, other weather conditions.)

This 129 cm, code 3, male, immature bottlenose dolphin was reported by Dr. Engle of 1009 Middle St., Sullivan's Island, on September 16, 1993 to the SCWMRD, who in turn contacted Wayne McFee at the Charleston Laboratory. The animal was found at the high tide mark behind some large rocks at 1005 Middle St., and was transported back to the Charleston Laboratory by Wayne McFee and James Daugomah. Upon arrival at the lab the animal was a code 3. Necropsy began at 1500. This animal was one of two dolphins reported for September 16, 1993. Weather conditions were fair, with the temperature in the mid-80's.

2. EXTERNAL OBSERVATIONS: (Include estimated maturity of animal, presence or absence of ectoparasites, lesions, apparent trauma or bruising, scar patterns, signs of decomposition, fisheries interaction indicators, damage due to scavengers. Examine and comment on eyes, mouth, teeth, blowhole, anal and genital slits.)

The dolphin was an immature male. Ectoparasites were not observed. Approximately 40% of the animal's skin was peeled off, and the animal was bloated. The animal was scarred extensively with scratches, possibly due to passing over the large rocks while stranding on the high tide. There was an indentation in the melon, though no bleeding in this area. The skin surrounding the blowhole and eyes appeared hemmorrhagic. The blowhole was found free of blood and parasites. The eyes were bloody and red. The genital and anal slit appeared normal. The upper teeth had emerged, while the lower teeth were just beginning to emerge. The teeth were counted and determined to be 22 right upper, 23 left upper, 21 right lower, and 21 left lower. There was evidence of scavenging by crabs and ants observed on the beach.

3. INTERNAL OBSERVATIONS:

Primary incision (Note condition/thickness of skin, blubber, vascular layer under blubber, fat pad, muscle, mammary glands, peritoneum, gross observations of viscera. Open and examine mammary gland ducts for nematodes)

The blubber layer was checked at three different locations: mid-dorsal 10 mm, mid-lateral 10 mm, and mid-ventral 9 mm. Primary incisions were made dorsal to ventral anterior to the right flipper, and then anterior to posterior along the ventral midline to the genital slit. The right flipper and scapula were removed. A window was cut to peel back the blubber layer. There was no distinguishable fat pad layer. No parasites were observed in the blubber layer. A sample of blubber was collected and frozen. The muscle layer was removed and the ribs pulled back to expose the viscera. A 100 gram sample was taken and frozen. The animal was severely bloated and because of its condition, no tissue collection was possible. The lungs appeared slightly hemmorrhagic and very lumpy. No parasites were observed in the lungs. The heart was removed and preserved in formalin. No parasites were observed in the chambers of the heart. The heart was not fatty. Once the right lung was removed the esophagus was cut and tied off anterior to the stomach. The esophagus did not contain any food particles. The liver was discolored and showing signs of severe decomposition. No parasites were observed in the liver. Once the liver was removed the stomach was tied-off, removed, and frozen. The stomach appeared to be empty of food particles but filled with fluid, suggesting that the animal had not eaten prior to death. The head was disarticulated at this time and flensed. The right eye was removed and placed in formalin. It could not be ascertained what caused the indentation of the melon. The skull appeared to be free of fractures and was not very bloody. Nodules were observed in the mesentary surrounding the intestine. Parasites were not observed in the intestine. The bladder was full. The left kidney appeared enlarged. The right kidney was

removed and frozen. Parasites were observed in the muscle layer of the tail stock, posterior of the dorsal fin. The entire skeleton was placed in freezer A.

4. CONCLUSIONS: (possible cause of death, apparent health of the animal, etc.)

The cause of death is unknown. There was a report of a blue-green algae bloom offshore, but this was determined by Dr. Fran VanDolah, NMFS not to be harmful. The condition of the animal made collection of tissues for analysis impossible, therefore no samples will be sent to the Armed Forces Institute of Pathology. It was not determined what caused the indentation to the melon. The health was not ascertained due to the decomposition of internal tissue.

5. SAMPLES RETAINED:

CHAS REF#	Sample Type	Use Code	Storage
MMES9316SC-1	heart	h	f
MMES9316SC-2	rt. eye	h	f
MMES9316SC-3	rt. kidney	t	z
MMES9316SC-4	blubber	t	z
MMES9316SC-5	muscle	t	z
MMES9316SC-6	stomach	l	z
MMES9316SC-7	skeleton	s	z

Key to Use codes:
f=preserved in formalin; z=frozen; b=biochemical analysis; h=histopathology; l=life history; t=toxicology; s=skeletal archive

CHARLESTON LABORATORY
FORENSICS PROJECT
NECROPSY NOTES

DATE: November 8, 1993

SPECIES AND SEX: *Tursiops truncatus* ; Male

LOCATION AND DATE OF STRANDING: Bulls Island, SC; November 4, 1993

SEUS STRANDING NETWORK INFORMATION: SC 9334; MMES 9329SC

LOCATION OF NECROPSY: On beach, Bulls Island

LEVEL A DATA COLLECTED BY: Wayne McFee, Tod Leighfield, Barry Stieglitz

NECROPSY TEAM MEMBERS: Wayne McFee (NMFS), Tod Leighfield (NMFS), Barry Stieglitz (USFWS, Cape Romain National Wildlife Refuge)

NECROPSY NOTES

1. GENERAL COMMENTS: (Include species, total length, sex, whether single or multiple occurrence, condition code, exact location of stranding, air and water temperature, other weather conditions.)

This 194 cm, late Code 2, male, bottlenose dolphin was reported at 1200 pm on November 4, 1993 by Barry Stieglitz, USFWS, to Wayne McFee, NMFS. Because of the cold temperatures the previous night, low 40's, the left side of the animal lying in the sand was a Code 2. Weather conditions upon necropsy were clear and near 70 degrees F, therefore causing the other one third of the body to be an early Code 3. Necropsy began on the beach at 1400. This animal was the only one reported for November 4, 1993. The majority of the carcass was left on the beach to be buried.

2. EXTERNAL OBSERVATIONS: (Include estimated maturity of animal, presence or absence of ectoparasites, lesions, apparent trauma or bruising, scar patterns, signs of decomposition, fisheries interaction indicators, damage due to scavengers. Examine and comment on eyes, mouth, teeth, blowhole, anal and genital slits.)

The animal is estimated as being a subadult male. Ectoparasites, possibly of the genus *Xenobalanus*, were observed on the flukes. The parasites were preserved in a glycerin/alcohol solution. A small, circular lesion was found on the left flipper, removed and preserved in formalin. The upper right jaw was bloody at the tip and abrasive. It is unclear whether this was from a pre-mortem wound or post-mortem scavengers on the beach. The dorsal fin had a characteristic V-notch and was scarred. The body was not heavily scarred. The blowhole contained adult parasites, probably from the genus *Nasitrema*. The parasites were preserved in a glycerin/alcohol solution. The right eye appeared normal, the left appeared swollen. The genital and anal slits appeared normal. The penis was beginning to protrude from the genital slit. The teeth were counted and determined to be 23 right upper, 23 left upper, 21 left lower, and 22 right lower. There appeared to be very small palatal abscesses on the anterior end of the upper jaw. There was minor evidence of scavenging on the beach. Photos were taken.

3. INTERNAL OBSERVATIONS: (Include progression of necropsy, noting exactly what was observed and what measures taken during each step.)

The blubber layer appeared very thin, < 8 mm, at mid-dorsal, mid-lateral, and mid-ventral (no instrument available for accurate measurements). Primary incisions were made dorsal to ventral, anterior to the right flipper, and then anterior to posterior along the ventral midline to the genital slit. The right flipper and scapula were removed. Two windows were cut to peel back the blubber layer. There was no fat pad layer. No parasites were observed in the blubber layer. No blubber sample was taken because of decomposition. The muscle layer appeared normal in color. The tissue surrounding the muscle layer was loaded with parasites, possibly cestodes. A sample of these parasites was removed and eventually preserved in alcohol/glycerin. Two samples of muscle tissue were collected and frozen. The muscle layer was removed and the ribs pulled back to expose the viscera. The external surface of the lung was lumpy and discolored in places. Internally, the lung contained a small number of parasites, and was hemorrhagic. A small piece was preserved in formalin, and one-third frozen. The right pulmonary lymph node was removed and preserved in formalin. The heart was removed , a 1cm square cut and preserved in formalin. The remaining heart was frozen. The heart had no coronary fat, no pericardial fluid, and was deep red in color. A blood sample was taken from the heart and kept chilled for analysis by Roche Biomedical Laboratories. The liver appeared blue-gray in color with a smooth exterior surface. No parasites were found internally. A 2 cm square was preserved in formalin. One-half of the liver was frozen. After the liver was removed, the anterior portion of the esophagus was cut and tied off. A small amount of food particles were found in the esophagus.

The upper intestine was cut and tied off, as was the esophagus, from the stomach and the stomach complex removed and frozen. The fore-stomach felt empty of food particles. The pancreas was sectioned and a piece preserved in formalin. The spleen was a pale, whitish color with dark spots. A 2cm square piece was excised and preserved in formalin. The remaining tissue was frozen. The head was disarticulated at this time and flensed. Parasites were found in the blowhole and sinuses as mentioned above. The right eye was removed and preserved in formalin. The hyoid was removed and placed with other collected skeletal pieces. The skull was opened posteriorly to remove the brain. The left cerebrum appeared in good condition and was removed and frozen. The right side of the brain was not salvageable. The melon was collected and frozen. The skull appeared to be free of fractures and not bloody. The right kidney appeared normal. A 1cm square was preserved in formalin, the rest frozen along with the left kidney. The right adrenal gland was preserved in formalin. The intestine was inspected and no parasites were found. The lining of the intestine was mustard colored with minimal digested contents. The bladder was mostly empty and free of parasites. The testes were removed and frozen. The flippers, scapulas, right pelvic bone, sternum, and some ribs were collected along with the skull and hyoid, and are presently in Freezer A at the Charleston Laboratory.

4. CONCLUSIONS: (possible cause of death, apparent health of the animal, etc.)

The cause of death is unknown. However, the presence of at least four species of parasites, a seemingly unhealthy spleen, and very thin bubber layer, may suggest the animal had a chronic infection which affected its immune system. There were no external injuries to suspect human interaction. A regime of formalin samples was collected to be sent to the Armed Forces Institute of Pathology for histopatholgical analysis. Parasites were collected for identification, and the skull will be examined to ascertain if the animal was an offshore animal. It has been suggested that the prescence of *Xenobalanus* on the flukes is a possible indicator of an offshore species.

5. SAMPLES RETAINED:

CR# MMES	SAMPLE	USE	STORAGE
9329SC-1	piece r. lung	h	f
9329SC-2	r. pulm. lymph node	h	f
9329SC-3	lesion l. flipper	h	f
9329SC-4	piece heart	h	f
9329SC-5	piece spleen	h	f
9329SC-6	piece liver	h	f
9329SC-7	piece r. kidney	h	f
9329SC-8	r. adrenal	h	f
9329SC-9	stomach tumor ?	h	f
9329SC-10	r. eye	h	f
9329SC-11	l. cerebrum	b	z
9329SC-12	whole stomach	l	z
9329SC-13	one-half liver	t	z
9329SC-14	r. kidney	t	z
9329SC-15	l. kidney	t	z
9329SC-16	heart	t	z
9329SC-17	one-third r. lung	t	z
9329SC-18	spleen	t	z
9329SC-19	*Xenobalanus*	l	a/g
9329SC-20	*Nasitrema* ?	l	a/g
9329SC-21	muscle	t	z
9329SC-22	muscle	t	z
9329SC-23	melon	t	z
9329SC-24	testes	l	z
9329SC-25	fascia tissue parasites	l	a/g
9326SC-26	skeletal parts	l	z

Key to Use/Storage codes:
f=preserved in formalin; z=frozen; a/g=alcohol/glycerin; b=biochemical analysis; h=histopathology; l=life history; t=toxicology; s=skeletal archive

CHARLESTON LABORATORY
FORENSICS PROJECT
NECROPSY NOTES

DATE: November 10, 1993

SPECIES AND SEX: *Tursiops truncatus;* female

LOCATION AND DATE OF STRANDING: Litchfield Beach, SC; 11/10/93

SEUS STRANDING NETWORK INFORMATION: SC-93-35

LOCATION OF NECROPSY: NMFS Charleston Laboratory

LEVEL A DATA COLLECTED BY: David Carter, Tod Leighfield, Kathy Moore, Connie Sears

NECROPSY TEAM MEMBERS: David Carter, Tod Leighfield, Kathy Moore, Connie Sears, Laura Webster

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NECROPSY NOTES

1. GENERAL COMMENTS: (Include species, total length, sex, whether single or multiple occurrence, condition code, exact location of stranding, air and water temperature, other weather conditions.)

The 239 cm, code 2, female *Tursiops truncatus* stranded on Litchfield Beach directly in front of the Litchfield Inn. It was reported to SCW&MRD on the morning of 11/10/93, and an agent was dispatched to retrieve the animal. John Coker (SCW&MRD) brought the animal to NMFS-Charleston Lab at 2:00 PM on 11/10/93. The weather was cool (low 60's). No other animals were reported stranded on 11/10.

2. EXTERNAL OBSERVATIONS: (Include estimated maturity of animal, presence or absence of ectoparasites, lesions, apparent trauma or bruising, scar patterns, signs of decomposition, fisheries interaction indicators, damage due to scavengers. Examine and comment on eyes, mouth, teeth, blowhole, anal and genital slits.)

The animal appeared to be mature, though her teeth were not very worn. *Xenobalanus* were found trailing from her flukes (only 1) and flippers (5 on the right, 6 on the left), and there were 5 scars on her dorsal fin. One possible parasite was found in the blowhole. Nine

Xenobalanus and the one suspected parasite from the blowhole were collected and preserved in formalin. No parasites were observed in the eyes, anal or genital slit, mammary slits, or mouth.

Faded teeth rakes were visible on the animal's sides. There was a deep (almost through the blubber layer) healed wound on the animal's right side. The wound was semi-circular in shape, with a large (4 cm diameter) chunk of blubber missing from one side of the semi-circle (photos were taken). The wound was whitish and surrounded by scar tissue. There were abrasions and a cut on the right side of the tail stock. It was not determined whether or not the tail stock wounds were caused by handling of the animal during carcass retrieval.

The skin on her left side had been abraded by sand at the site of the stranding, and the skin on the right side was just beginning to peel. The right eye was punctured, probably by scavengers. She was not bloated.

3. INTERNAL OBSERVATIONS:

The blubber thickness was 15 mm mid-dorsal, 10 mm mid-lateral, and 11 mm mid-ventral. The primary incision was made just through the blubber layer, dorsal-to-ventral immediately posterior to the right flipper, and then along the ventral midline to the genital slit. The blubber was firm and pinkish white. Blubber windows were then carefully peeled back to expose the underlying muscle. A hard mass was encountered in the blubber 8 cm anterior to the genital slit and 5 cm dorsal to the ventral midline on the animal's right side. It was not determined whether or not this was scar tissue, as there was no visible scarring on the skin over the mass. No parasites were noted in the blubber layer or in the underlying muscle. There was no fat pad between the muscle and the blubber.

The right flipper and scapula were removed, and the ribs and muscle layer were peeled back to reveal the thoracic cavity. The lung appeared normal in color, and contained only a few hardened nodules. A small yellowish nodule (possibly an encysted parasite) was extracted and preserved in formalin. Two pulmonary lymph nodes were also taken and preserved. The inside of the trachea was coated with a reddish-purple film.

The heart was firm and dark red. It was sectioned and examined, and a small piece was preserved in formalin. No parasites were noted, and major vessels around the heart were clean and clear of obstruction.

The diaphragm was cut open to reveal the peritoneal cavity. The intestines were quite green, and the liver had a green tinge (photo taken), though the organs did not appear to be very decomposed (the animal was cold on the inside, and the liver, kidneys, and brain were intact). The stomach was firmly adhered to the liver. Liver was collected for tox and histopath analyses. The stomach was tied off at both ends and removed whole. It will be shipped to Nélio Barros at Sea World for stomach contents analysis. The stomach did not feel full. The spleen appeared normal in color and texture. The walls of the upper intestine were coated with a yellow-orange mucoid film, the middle of the intestine contained a yellow paste, and the lower intestine was empty.

The adrenal glands were collected. The kidneys were cohesive and not showing signs of decomposition. A sample of the right kidney was taken for histopath analysis, and the remains of the right kidney and the entire left kidney were taken for tox analysis. The left

ovary was tagged, and the uterus, fallopian tubes, ovaries, and urinary bladder were removed whole. The urogenital system was inspected for nodules and parasites, and no anomalies were found.

The head was removed by disarticulating the skull from the first vertebra. The eyes were removed and placed in formalin. The tongue and upper and lower palates appeared to be normal. No parasites were found in the nasal cavities when the head was flensed. The brain was pink and in good shape. A section of the left cerebellum was removed and placed in formalin, and the remaining brain was frozen in the skull for future analysis of acetylcholinesterase activity.

4. CONCLUSIONS: (possible cause of death, apparent health of the animal, etc.)

The immediate cause of the animal's death is unknown. The blubber layer was somewhat thin, and the fat pad next to the muscle layer was absent, perhaps indicating protracted illness. The severe adhesions between the stomach and the liver possibly indicated healing injuries or irritation. The bright green coloration of the upper intestine and greenish tinge on the liver could have been due to bile. The wound on the animal's right side appeared to have been severe, but was mostly healed. It is hoped that histopathological analysis of the tissues collected will yield information on the cause of death.

5. SAMPLES RETAINED:

Chas. Ref. #	Sample type	Use code	Disposition/storage
MMES9330SC-1	*Xenobalanus*	h	f
MMES9330SC-2	blubber	t	z
MMES9330SC-3	r. flipper & scapula	s	z
MMES9330SC-4	r. pulmonary lymph node	h	f
MMES9330SC-5	r. lung	h	f
MMES9330SC-6	r. lung	b	z
MMES9330SC-7	r. pulmonary lymph node	h	f
MMES9330SC-8	parasite from l. lung	h	f
MMES9330SC-9	parasite from esophagus	h	f
MMES9330SC-10	heart	b	z
MMES9330SC-11	heart	h	f
MMES9330SC-12	parasite from blowhole	h	f
MMES9330SC-13	liver	h	f
MMES9330SC-14	liver	t	z
MMES9330SC-15	melon	b	z
MMES9330SC-16	spleen	h	f
MMES9330SC-17	hyoid	s	z
MMES9330SC-18	eyes (right is slit, left is whole)	b,l	f
MMES9330SC-19	stomach	l	z
MMES9330SC-20	adrenals (left is tagged)	h	f
MMES9330SC-21	r. kidney	h	f
MMES9330SC-22	r. kidney	t	z
MMES9330SC-23	l. kidney	t	z
MMES9330SC-24	l. cerebrum	h	f
MMES9330SC-25	r. mammary	l,h	f
MMES9330SC-26	urogenital tract	l	z
MMES9330SC-27	skull	l,s	z
MMES9330SC-28	last 4 thoracic vertebrae	l,s	z

Key to Use codes:
f=preserved in formalin; z=frozen; b=biochemical analysis; h=histopathology; l=life history; t=toxicology; s=skeletal archive

DEPARTMENT OF DEFENSE
ARMED FORCES INSTITUTE OF PATHOLOGY
WASHINGTON, DC 20306-6000

REPLY TO ATTENTION OF

PATIENT IDENTIFICATION		PLEASE USE AFIP ACCESSION NUMBER IN ALL CORRESPONDENCE
AFIP ACCESSION NUMBER 2432968-2	CHECK DIGIT	SEQUENCE 00
NAME ANIMAL, CETACEA DOLPHIN SC-93-35 T DR MCFEE		SSAN
SURGICAL/AUTOPSY PATH ACCESSION #'S		
PLEASE INFORM US OF ANY PATIENT IDENTIFICATION ERRORS		

TPL/FQF/dyj

Mr. Wayne McFee
National Marine Fisheries Service
217 Ft. Johnson Road
Charleston, SC 29412

DATE: 15 March 1994

CONSULTATION REPORT ON CONTRIBUTOR MATERIAL

AFIP DIAGNOSIS: SC-93-35 1. Eye, left (per contributor), lens: Cataractous change, focally extensive, moderate, Atlantic bottlenose dolphin (Tursiops truncatus), cetacean.
2. Lung: Congestion, diffuse, mild, with multifocal intra-alveolar edema.
3. Lung: Granuloma, eosinophilic.
4. Lung: Arteriolar hyperplasia and fibrosis, subpleural, moderate.
5. Lung: Pneumonia, interstitial, lymphoplasmacytic and eosinophilic, chronic, multifocal, mild.
6. Lymph node, right pulmonary: Lymphadenitis, eosinophilic, diffuse, moderate.
7. Spleen, white pulp: Lymphoid hyperplasia, diffuse, moderate.
8. Mammary gland: Mastitis, lymphohistiocytic, multifocal, mild, with corpora amylacea.
9. Heart, myocardium: Fibrosis, multifocal, mild.
10. Brain, cerebrum: Congestion, diffuse, mild.

COMMENT: The cause of the cataract is not apparent. Since only one eye was submitted, we do not know if the condition was bilateral. This finding may be of limited significance since it is known that blind bottlenose dolphins can catch fish and function relatively normally using echolocation. The eosinophilic granuloma, chronic interstitial pneumonia, and eosinophilic lymphadenitis were probably caused by parasitism. The pulmonary congestion and edema and cerebral congestion are nonspecific terminal changes. The other lesions listed above are considered incidental findings. The apparent relatively poor nutritional condition of the carcass and the presence of several barnacles on flippers and fluke suggest that the dolphin may have had a condition that caused weight loss and slow swimming, but we are unable to determine the cause of her illness. Knowledge of whether or not the stomach contained fish is important in differentiating sudden death from more chronic illnesses. Please open the stomach and make this determination prior to sending the stomach and contents off for prey analysis.

2432968-2 00
ANIMAL, CETACEA DOLPHIN
SC-93-35 T DR MCFEE

Selected tissues tested for morbillivirus antigen by an immunoperoxidase technique were negative.

Thank you for submitting this case to the Registry of Veterinary Pathology.

THOMAS P. LIPSCOMB, DVM
MAJOR, VC, USA
Chief, Division of Veterinary
Pathology

CHARLESTON LABORATORY
FORENSICS PROJECT
NECROPSY NOTES

KM

DATE: November 18, 1993

SPECIES AND SEX: *Tursiops truncatus;* male

LOCATION AND DATE OF STRANDING: Seabrook Island, SC; 11/16/93

SEUS STRANDING NETWORK INFORMATION: SC-93-36

LOCATION OF NECROPSY: NMFS Charleston Laboratory

LEVEL A DATA COLLECTED BY: Tod Leighfield, Kathy Moore, Connie Sears, Laura Webster, Debra Wolf

NECROPSY TEAM MEMBERS: Tod Leighfield, Kathy Moore, Connie Sears, Laura Webster, Debra Wolf

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NECROPSY NOTES

1. GENERAL COMMENTS: (Include species, total length, sex, whether single or multiple occurrence, condition code, exact location of stranding, air and water temperature, other weather conditions.)

The 265 cm male bottlenose dolphin stranded near Loggerhead Court on Seabrook Island on the morning of 11/16/93. The animal was reported to Seabrook Island Security and to Pat Leonard, the local Sea Turtle Stranding Coordinator around 10:30 AM by Lou Favret. SCW&MRD notified Kathy Moore at NMFS at 1:30 PM. Kathy Moore, Laura Webster, and Debra Wolf retrieved the animal. It was a sunny day with a light breeze. The air temperature was in the upper 70's, and the water temperature was 62°F. This was the only stranding reported for the day. The animal was a code 2 at the time of necropsy.

2. EXTERNAL OBSERVATIONS: (Include estimated maturity of animal, presence or absence of ectoparasites, lesions, apparent trauma or bruising, scar patterns, signs of decomposition, fisheries interaction indicators, damage due to scavengers. Examine and comment on eyes, mouth, teeth, blowhole, anal and genital slits.)

The animal was very robust and appeared to be very fresh. It was lying on its right

side. There was one *Xenobalanus globicipitus* attached to the flukes; the barnacle was still alive when the animal was retrieved from the beach. The *Xenobalanus* was collected in formalin. The skin was still smooth and various shades of grey, and was not peeling at all. There was no damage due to scavengers. A parasite was found in the blowhole. Eyes were still clear and shiny. The teeth were somewhat worn, and there appeared to be faint lesions on the tongue.

The animal was bleeding from a short (6 cm long) set of rake marks about 5 cm behind the blowhole. There was a gouge and a deep 5.5 cm long cut at the tip of the lower jaw, running parallel to the body axis. The cut gave the animal the appearance of a cleft chin (photos were taken). The wound in the jaw was not bloody, and did not appear to have been recent. Light teeth rake marks were visible on the skin over much of the body. There was a single, shallow, 30 cm long cut on the animal's right side; it was mid-lateral and parallel to the body axis. A large (45 cm by 19 cm), shallow area of scar tissue was visible on the skin on the animal's right lateral side, just anterior and dorsal to the genital slit (photo taken).

3. INTERNAL OBSERVATIONS:

The blubber thickness was 25 mm mid-dorsal, 20 mm mid-lateral, and 26 mm mid-ventral. The primary incision was made dorsal-to-ventral, just through the blubber layer, immediately posterior to the axilla of the right flipper. The incision was continued along the ventral midline to the genital slit. The blubber was firm, pinkish white, and spotted with blood. The right flipper and scapula were removed. Blubber windows were then carefully peeled back to expose the underlying muscle. No parasites were noted in the blubber layer or in the muscle layer. A fat pad was visible between the muscle and the vascular layer underlying the blubber.

The lung was smooth and mottled pink/brown, with few cysts (one of which was collected in formalin). A parasite was found in the trachea and preserved in formalin. A small amount of bloody foam was found in the right bronchial tube. A pulmonary lymph node was collected, as well as frozen and formalin-fixed sections of the right lung. The left lung appeared fairly smooth, with few nodules.

The pericardium was opened and the heart was examined. The aorta and the top of the left ventricle were off-white to grey in color. The atria were a pinkish grey, and the bottom of the ventricles was red (a photo was taken). The chambers and the major vessels surrounding the heart were free of visible parasites, but the aorta and major vessels contained amorphous substances of unknown composition. There were two different types of material removed from the major vessels; in both cases, the material (hereafter referred to as "clots") did not appear to be attached to the walls of the vessels, but appeared instead to simply be lying, free, in the vessels. One of the clots was a very dark red material with bubbles of air trapped in it. It was about 5 cm long, and had the consistency of turgid "bubble-wrap" packing material (for lack of a better analogy). One necropsy team member offered that it felt like lung tissue, except the graininess of the lung is much finer. The other clot was similar in size, cream-colored, roughly fusiform, and had a texture like smooth rubber, with strings of dark reddish-brown material wrapped around it. The whole heart and the clots were preserved in formalin. The clots did not resemble clotted blood in texture or appearance.

The abdominal cavity was opened and examined. The liver was dark grey on the surface and somewhat lumpy. The inside of the liver was a dark olive-drab. Sections of liver

were preserved in formalin or frozen. There were minor adhesions between the stomach and liver. The first two chambers of the stomach felt as if they may have contained food, but the third chamber felt empty. The stomach complex was tied off at the esophageal and intestinal ends and removed whole. They will be shipped to Nélio Barros at Sea World for stomach contents analysis. The spleen was somewhat lumpy, but normal in color. A section of spleen was preserved in formalin. The esophagus was empty. The upper intestine near the stomach was pink and full of a watery mustard-yellow fluid; farther along towards the lower intestine, the fluid was a watery brown. The lower intestine and connecting mesentery were dark reddish-purple (a section was collected in formalin). The lower part of the intestine was filled with a thick olive-green paste. There was a constriction in the intestine about 25 cm before the anus. Below the constriction, the intestine was empty. Immediately before the constriction, the olive-green paste was very grainy. No parasites were noted in the esophagus or intestine.

The adrenal glands were collected in formalin. The kidneys were firm, cohesive, and ruddy brown in color. A section of the right kidney with a possible parasite was collected in formalin. The remains of the right kidney and the entire left kidney were collected and frozen. The testes were removed and examined. They were milk-white and smooth in texture. A section of the right testis was preserved in formalin, and the whole left testis was frozen. The urinary bladder was full. The inside wall of the bladder was mottled with small rust-colored spots near the opening to the urethra (a piece of the bladder wall was preserved in formalin). No parasites were found in the genital slit.

25.4cm

The head was removed by disarticulating the skull from the first vertebra. The eyes were removed and placed in formalin. A section of the tongue with faint lesions was removed and placed in formalin. The melon was collected. The head was partially flensed, and more parasites were removed from the nasal passages. The calvarium was opened, and the brain was pink and in good shape. A section of the left cerebellum was removed and placed in formalin, and the remaining brain was frozen in the skull for future analysis of acetylcholinesterase activity.

4. CONCLUSIONS: (possible cause of death, apparent health of the animal, etc.)

The primary cause of the animal's death is undetermined. The unusual condition of the heart suggests that the animal may have died from heart problems. The purple color of the lower intestine suggests colitis. The fact that the animal had a healthy blubber layer and fat pad may indicate that the illness was not protracted. It is hoped that histopathological analysis of the tissues collected will yield information on the cause of death.

5. SAMPLES RETAINED:

Chas. Ref. #	Sample type	Use code	Disposition/storage
MMES9331SC-1	*Xenobalanus* from flukes	h	f
MMES9331SC-2	parasite from blowhole	h	f
MMES9331SC-3	blubber	t	z
MMES9331SC-4	blubber	h	f
MMES9331SC-5	r. flipper and scapula	s	z
MMES9331SC-6	r. lung	b	z
MMES9331SC-7	r. lung	h	f
MMES9331SC-8	r. pulmonary lymph node	h	f
MMES9331SC-9	whole heart	h	f
MMES9331SC-10	liver	h	f
MMES9331SC-11	liver	t	z
MMES9331SC-12	stomach	l	z
MMES9331SC-13	spleen	h	f
MMES9331SC-14	adrenals (left is tagged)	h	f
MMES9331SC-15	kidneys	t	z
MMES9331SC-16	r. kidney	h	f
MMES9331SC-17	section of lower intestine	h	f
MMES9331SC-18	parasite from trachea	h	f
MMES9331SC-19	r. testis	h	f
MMES9331SC-20	l. testis	b	z
MMES9331SC-21	tongue with lesions?	h	f
MMES9331SC-22	urinary bladder w/anomalous coloration	h	f
MMES9331SC-23	eyes (r. is slit, l. is whole)	h,l	f
MMES9331SC-24	melon	b	z
MMES9331SC-25	first 5 ribs	l,s	z
MMES9331SC-26	l. cerebrum	h	f
MMES9331SC-27	skull	s,l	z
MMES9331SC-28	last 4 thoracic vertebrae	s,l	z

Key to Use codes:
f=preserved in formalin; z=frozen; b=biochemical analysis; h=histopathology; l=life history; t=toxicology; s=skeletal archive

DEPARTMENT OF DEFENSE
ARMED FORCES INSTITUTE OF PATHOLOGY
WASHINGTON, DC 20306-6000

REPLY TO ATTENTION OF

PATIENT IDENTIFICATION		PLEASE USE AFIP ACCESSION NUMBER IN ALL CORRESPONDENCE
AFIP ACCESSION NUMBER: 2432966-6	CHECK DIGIT:	SEQUENCE: 00
NAME: ANIMAL, CETACEA DOLPHIN SC-93-36 T DR MCFEE		SSAN:
SURGICAL/AUTOPSY PATH ACCESSION #'S		
PLEASE INFORM US OF ANY PATIENT IDENTIFICATION ERRORS		

TPL/WDF/dyj

Mr. Wayne McFee
National Marine Fisheries Service
217 Ft. Johnson Road
Charleston, SC 29412

DATE: 25 March 1994

CONSULTATION REPORT ON CONTRIBUTOR MATERIAL

AFIP DIAGNOSIS: SC-93-36 1. Lung, right: Pneumonia, peracute, multifocal, moderate, with numerous gram-negative bacilli and bacillary emboli, Atlantic bottlenose dolphin (Tursiops truncatus), cetacean.
2. Lymph node, lung-associated, right: Bacillary emboli, gram-negative, multifocal, numerous, with multifocal peracute necrotizing lymphadenitis.
3. Spleen: Bacillary emboli, gram-negative, disseminated, numerous.
4. Eye, left: Hemorrhage, subretinal, acute, multifocal, moderate, with retinal detachment and uveal and scleral gram-negative bacillary emboli.
5. Intestine, mesentery: Congestion and hemorrhage, acute, diffuse, moderate.
6. Tongue, lamina propria and submucosa: Congestion, acute, diffuse, mild, with rare intravascular gram-negative bacillary emboli.
7. Urinary bladder: Cystitis, necroulcerative, acute, diffuse, severe.
8. Brain, cerebrum: Congestion, acute, diffuse, mild, with multifocal perivascular edema and hemorrhage.
9. Lung, right: Granuloma, eosinophilic, focal.
10. Lung, right, pleura: Fibrosis, diffuse, mild, with vascular proliferation.
11. Lymph node, right, lung-associated: Lymphadenitis, necrotizing and granulomatous, subacute to chronic, focal, mild.
12. Lymph node, right, lung-associated: Eosinophilic infiltrates, multifocal, mild.
13. Testis; skin; adrenal gland, right; kidney, right; nerves, site not specified: Within normal limits.

Comment: The cause of death is peracute gram-negative septicemia and pneumonia. The route by which the bacteria gained access to the vascular system is unclear, but the acute ulcerative cystitis might have been the initial site of infection. It is very likely that bacterial culture of heart blood would have identified the specific

bacteria that caused the septicemia. Cases of this type can result in serious infections in the people who handle the carcass and perform the necropsy. Accidental cuts are particularly dangerous; thus, great care should always be taken when handling carcasses. The pulmonary granuloma, subacute to chronic lymphadenitis, and the eosinophilic infiltrates in lymph nodes were probably caused by parasitism. Enclosed is a list of tissues we would like you to collect.

Thank you for submitting this interesting case to the Registry of Veterinary Pathology.

THOMAS P. LIPSCOMB, DVM
for MAJOR, VC, USA
Chief, Division of Veterinary Pathology

CHARLESTON LABORATORY
FORENSICS PROJECT
NECROPSY NOTES

DATE: November 24, 1993

SPECIES AND SEX: *Tursiops truncatus*; Female

LOCATION AND DATE OF STRANDING: Myrtle Beach, SC; November 17,1993

SEUS STRANDING NETWORK INFORMATION: SC 9337; MMES 9332 SC

LOCATION OF NECROPSY: Begun on beach, removed to Charleston Laboratory

LEVEL A DATA COLLECTED BY: Wayne McFee, Debbie Wolf, Jim Burton

NECROPSY TEAM MEMBERS: Wayne McFee, Debbie Wolf, Greg Mitchum

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NECROPSY NOTES

1. GENERAL COMMENTS: (Include species, total length, sex, whether single or multiple occurrence, condition code, exact location of stranding, air and water temperature, other weather conditions.)

This 210 cm, late code 3, adult female bottlenose dolphin was discovered on the beach on the night of November 16, 1993 by Jim Burton (network volunteer), and reported to Wayne McFee, NMFS, in the morning of November 17, 1993. The animal was discovered at 15th Avenue North, Myrtle Beach, S.C. with its ventral surface slit open 81 cm from chest to genital opening and viscera exposed. Weather conditions were foggy, but clearing, approximately 65 degrees, when the animal was picked up by Wayne McFee and Debbie Wolf at approximately 1200. The necropsy was begun on the beach but was discontinued due to tourist interest. The decision was made to finish the necropsy at the Charleston Laboratory. This animal was the only one reported for November 17, 1993.

2. EXTERNAL OBSERVATIONS: (Include estimated maturity of animal, presence or absence of ectoparasites, lesions, apparent trauma or bruising, scar patterns, signs of decomposition, fisheries interaction indicators, damage due to scavengers. Examine and comment on eyes, mouth, teeth, blowhole, anal and genital slits.)

The animal is estimated to be an adult female. Ectoparasites, probably of the genus *Xenobalanus*, were observed on the flukes, and alive. The parasites were preserved in a glycerin/alcohol solution. As mentioned above, the ventral surface was slit 81 cm from chest to genital slit, exposing the viscera. A puncture wound, mid-ventral, below right flipper was 15 mm long and 4 mm wide. A cut, approximately 10 cm long, wrapped around the tail stock. Two parallel cuts, approximately 3-4 cm long, at an angle of about 45 degrees, were seen on the right flipper. The skin was peeled off most of the body and minor bloating had occurred. "Pin-hole" lesions were found around the tail stock and on the right lateral side, posterior to the dorsal fin. The lesions were preserved in formalin. The blowhole exuded blood when touched. The eyes were beginning to turn a green color.The dorsal fin was slightly disfigured with healed wounds, possibly from shark bites. The teeth were counted and determined to be 22 left upper, 22 right upper, 21 left lower, and 21 right lower. There was no evidence of extensive scavenging. Photographs were taken.

3. INTERNAL OBSERVATIONS: (Include progression of necropsy, noting exactly what was observed and what measures taken during each step.)

The blubber layer was measured at two locations, mid-dorsal 14 mm and mid-lateral 12 mm. The mid-ventral measurement was not taken since ventral surface had been slit open. The primary incision was made from dorsal to ventral anterior of the right flipper. Windows were cut from dorsal to ventral to peel back the blubber layer and expose the muscle layer. The existing ventral incision was used as the second primary incision. The right flipper and scapula were removed. The animal had athin layer of subdermal fat, and the muscle layer appeared normal, although was decaying rapidly and becoming discolored. Parasitic cysts were found between the muscle and blubber layer on the right ventral side posterior to the dorsal fin. The muscle layer was removed to better expose the viscera. Most tissues were observed in a state of severe decomposition so normal necropsy procedure ceased. General observations will be stated at this time. The right lung appeared very bloody. The left lung had two small holes (pencil width size) posteriorly. This tissue was preserved in formalin. The right pulmonary lymph node was placed in formalin with a possible abscess attached. No parasites were found in the blubber, heart, pharynx, larynx, or liver. The esophagus was found to contain some fish bones. The bones were frozen. The head was disarticulated from the body and flensed. The brain was not collected because of severe decomposition. The stomach was swollen with fish bones, indicating the animal had been feedinf at the time of death. The stomach complex was tied off at the esophageal and intestinal ends, removed, and frozen. A growth (lymph node?) from the right side of the lower intestine was removed and preserved in formalin. The conditions of

the liver, kidneys, reproductive tract, etc., were too decomposed to save. The whole skelton was flensed and frozen along with the skull.

4. CONCLUSIONS: (possible cause of death, apparent health of the animal, etc.)

The immediate cause of death is unknown. However, the extremely full stomach, existing ventral slit, and cuts posterior to the dorsal and on the flipper, is suggestive of human interaction. Tissues were autolyzed and, therefore, will not be sent to the Armed Forces Institute of Pathology for histopath analysis. The entire skeleton is located in Freezer A at the Charleston Laboratory.

5. SAMPLES RETAINED:

CHAR.REF.#	SAMPLE	USE	STORAGE
MMES 9332SC-1	*Xenobalanus*	l	g/a
MMES 9332SC-2	skin lesions	h	f
MMES 9332SC-3	piece r. lung	h	f
MMES 9332SC-4	r. pulm. lyph node abscess	h	f
MMES 9332SC-5	fish bones - esophagus	l	z
MMES 9332SC-6	stomach complex	l	z
MMES 9332SC-7	muscle cysts	h	g/a
MMES 9332SC-8	growth? - intestine	h	f
MMES 9332SC-9	l. lung w/ holes	h	f
MMES 9332SC-10	skeleton	l	z

Key to Use/Storage codes:
f=preserved in formalin; z=frozen; b=biochemical analysis; h=histopathology; l=life history; t=toxicology; s=skeletal archive

CHARLESTON LABORATORY
FORENSICS PROJECT
NECROPSY NOTES

DATE: November 24, 1993

SPECIES AND SEX: *Stenella frontalis*; Female

LOCATION AND DATE OF STRANDING: Incidental catch in commercial gill net, NC

SEUS STRANDING NETWORK INFORMATION: WHOI 01953; MM 1-72(C)

LOCATION OF NECROPSY: Coastal Carolina University, Conway, SC

LEVEL A DATA COLLECTED BY: Debbie Wolf, network volunteers

NECROPSY TEAM MEMBERS: Wayne McFee, Debbie Wolf, Dr. Rob Young (CCU)

NECROPSY NOTES

1. GENERAL COMMENTS: (Include species, total length, sex, whether single or multiple occurrence, condition code, exact location of stranding, air and water temperature, other weather conditions.)

This 173 cm, code 2, adult female spotted dolphin was taken as an incidental catch in a commercial gill net fishery offshore North Carolina. This animal was delivered by the Woods Hole Oceanographic Institute to NMFS, Beaufort, North Carolina. Bill Bowen, NMFS-Beaufort, delivered the animal to the NMFS, Charleston Laboratory on July 14, 1992, for use in a necropsy training session. The animal was thawed out for two days before transport to Coastal Carolina University, Conway, South Carolina for a training session with network volunteers and students, on the morning of November 20, 1993 by Wayne McFee and Debbie Wolf, NMFS. Necropsy commenced at 0930, outside, with clear skies and a temperature of approximately 60 degrees F.

2. EXTERNAL OBSERVATIONS: (Include estimated maturity of animal, presence or absence of ectoparasites, lesions, apparent trauma or bruising, scar patterns, signs of decomposition, fisheries interaction indicators, damage due to scavengers. Examine and comment on eyes, mouth, teeth, blowhole, anal and genital slits.)

Level A measurements were recorded by network volunteers. The animal was freezer burned on the rostrum, melon, tongue, and tail stock, from genital slit to flukes. The skin was peeling in a few places, but not extensive. Scratches on the body were minimal. The tongue and mouth appeared normal. A dorsal fin clip was taken and frozen. The exterior surface appeared void of ectoparasites. The eyes appeared bloody. The teeth were counted and determined to be 31/4 left upper, 33/2 right upper, 35 left lower, and 35 right lower. There was no evidence of scavenging. Photographs were taken.

3. INTERNAL OBSERVATIONS: (Include progression of necropsy, noting exactly what was observed and what measures taken during each step.)

The blubber layer was measured at three locations, mid-dorsal 15 mm, mid-lateral 13 mm, and mid-ventral 12 mm. The primary incision was made from dorsal to ventral, anterior of the right flipper, and anterior to posterior along the ventral mid-line to the genital slit. Two windows were cut, one from dorsal to ventral anterior of the dorsal fin, and the other posterior of the dorsal fin. The right flipper and scapula were removed. The blubber layer was peeled back to expose the viscera. The blubber contained encysted parasites, which were preserved in formalin. A 10 cm square of blubber and skin was removed and frozen. The muscle appeared deep red and in good condition. Adult parasites were found in the muscle layer mid-lateral and just posterior of the dorsal fin. A section was removed and frozen. The muscle layer was removed and the ribs peeled back to expose the viscera. The right lung was pinkish-red in color and mostly smooth. A 3 cm section was removed and preserved in formalin. One-half of the right lung was removed and frozen. The right lung was slightly hemorrhagic and foamy. The right pulmonary lymph node was removed and preserved in formalin. Fibrin tags were present on the edges of the lymph node. The right lung was removed to expose the heart. There was no fluid in the pericardial sac. Arterial walls of the heart appeared normal and free of parasites. Pieces from the right and left ventricles were preserved in formalin. The whole heart was removed and frozen. The esophagus had been inadvertently sliced laterally during removal of the right lung and heart. This turned out to be helpful as it exposed squid tenticles and beaks, and fish bones still in the esophagus just anterior to the connection with the stomach. The left side of the body was still slightly frozen so water was run through the cavity. The dorsal aorta was easily viewed in this semi-frozen state. A section of the dorsal aorta was preserved in formalin. The liver was still mostly frozen, so the posterior end of the animal was examined. The female was pregnant with a near-term ~~male~~ female fetus in the left uterus. Amniotic fluid was frozen. Encysted parasites appeared as black dots in the umbilical cord. The right ovary was removed and preserved in formalin. The fetus and uterus were removed and frozen. The right uterus was removed and frozen. Mammary tissue was

removed and frozen. The right adrenal was preserved in formalin. The right kidney appeared normal in color and texture. A piece was preserved in formalin and the remaining tissue frozen. The liver and stomach complex were beginning to thaw so that it was possible to re-examine the anterior end of the animal. The liver appeared normal in color with a smooth exterior surface. A fibrin tag was discovered on the edge of the posterior lobe of the liver. This was preseved in formalin. A 3 cm square of liver was preserved in formalin. A large section of the liver was frozen. No parasites were found in the liver. The remaining liver was removed from the stomach. At this time the skull was disarticulated from the body and flensed. Both eyes appeared bloody. Both were removed and preserved in formalin. No parasites were found in the blowhole or trachea. The tongue was freezer-burned proximally. A section of trachea was preserved in formalin. The post cranium was opened to expose the cerebrum. The brain appeared hemorrhagic, and was beginning to deteriorate. A small section of the left cerebrum was preserved in formalin. The left lung was pinkish-red in color and slightly hemorrhagic. A piece of left lung was preserved in formalin and a section was frozen. The left pulmonary lymph node was preserved in formalin. Another section of the lung was very frothy and was preserved in formalin. The distal end of the esophagus was tied-off as was the upper portion of the intestine attached to the stomach complex. The stomach appeared mostly full, suggesting the animal had been eating just prior to death. The stomach complex was removed and frozen. The pancreas was whitish in color hard. The pancreas was rmoved and frozen. The spleen appeared normal in color and texture. No parasites were found in the spleen. The spleen was removed and frozen. The left kidney appeared normal in color and texture. It was removed and frozen.The intestine was examined and appeared filled with a black granular substance in the mid intestine. Small crescent-shaped intestinal worms were also discovered in this region. The upper intestine was clear of this substance.
The remaining skeleton was flensed and transported back to the Charleston Laboratory. Photographs were taken throughout the session.

*** NOTE: Formalin samples were collected only as part of a demonstration of collection techniques for network volunteers. They will not be analyzed by the AFIP since the animal was frozen prior to necropsy.

4. CONCLUSIONS: (possible cause of death, apparent health of the animal, etc.)

The cause of death of this animal was the result of human interaction, specifically a commercial gill net fishery off the North Carolina coast. The animal otherwise appeared healthy, though parasitism was heavy in the blubber, muscle, and intestine. The blood in the brain case and lungs may be the result of trauma just prior to death. Since the entire animal was frozen prior to necropsy, no histological samples will be sent to the Armed Forces Institute of Pathology.

5. SAMPLES RETAINED:

CHAR.REF.#	SAMPLE	USE	STORAGE
MM1-72(c)-1	Fin clip	l	z
MM1-72(c)-2	blubber	t	z
MM1-72(c)-3	blubber w/ cysts	l	f
MM1-72(c)-4	muscle	l,t	z
MM1-72(c)-5	muscle parasite	l	f
MM1-72(c)-6	piece r. lung	h	f
MM1-72(c)-7	r. pulmonary lymph node	h	f
MM1-72(c)-8	Fibrin tag liver	h	f
MM1-72(c)-9	piece liver	h	f
MM1-72(c)-10	r. lung	b,t	z
MM1-72(c)-11	piece heart r. ventricle	h	f
MM1-72(c)-12	l. ventricle piece	h	f
MM1-72(c)-13	fish bones/squid beaks	l	z
MM1-72(c)-14	liver	t	z
MM1-72(c)-15	amniotic fluid	l,b	z
MM1-72(c)-16	l. ovary	h	f
MM1-72(c)-17	r. adrenal	h	f
MM1-72(c)-18	piece r. kidney	h	f
MM1-72(c)-19	r. kidney	t	z
MM1-72(c)-20	heart	t.b	z
MM1-72(c)-21	piece of trachea	h	f
MM1-72(c)-22	piece l. lung	h	f
MM1-72(c)-23	l. adrenal	h	f
MM1-72(c)-25	l. pulmonary lymph node	h	f
MM1-72(c)-26	l. lung	t	z
MM1-72(c)-27	piece l. lung	h	f
MM1-72(c)-28	dorsal aorta	h	f
MM1-72(c)-29	spleen	t	z
MM1-72(c)-30	r. eye	h	f
MM1-72(c)-31	l. eye	h	f

MM1-72(c)-32	stomach complex	l	z
MM1-72(c)-33	pancreas	t	z
MM1-72)c)-34	l. kidney	t	z
MM1-72(c)-35	uterus	l	z
MM1-72(c)-36	unk. lymph node	h	f
MM1-72(c)-37	intestinal worms	l	z
MM1-72(c)-38	l. cerebrum	b	z
MM1-72(c)-39	mammary tissue	l	z
MM1-72(c)-40	skull	l	z
MM1-72(c)-41	fetus	l	f

Key to Use/Storage codes:
f=preserved in formalin; z=frozen; b=biochemical analysis; h=histopathology; l=life history; t=toxicology; s=skeletal archive

CHARLESTON LABORATORY
MARINE MAMMALS & PROTECTED SPECIES PROJECT
NECROPSY NOTES

DATE: December 2, 1993

SPECIES AND SEX: *Kogia breviceps*; Male

LOCATION AND DATE OF STRANDING: Huntington Beach, SC; 11/29/93

SEUS STRANDING NETWORK INFORMATION: SC 9342; MMES 9336SC

LOCATION OF NECROPSY: NMFS Charleston Laboratory

LEVEL A DATA COLLECTED BY: Wayne McFee, Debbie Wolf, James Daugomah, Wendy Teas (NMFS-Miami)

NECROPSY TEAM MEMBERS: Wayne McFee, Debbie Wolf, Greg Mitchum, Kathy Moore, James Daugomah, David Rackley

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NECROPSY NOTES

1. GENERAL COMMENTS: (Include species, total length, sex, whether single or multiple occurrence, condition code, exact location of stranding, air and water temperature, other weather conditions.)

This 308 cm, code 2, adult male pygmy sperm whale was called in by Mike Evans to Chris Marlow (network volunteer) at approximately 1100 on November 29, 1993. The animal was alive but died within 45 minutes on Huntington Beach, SC. Weather conditions were cool (60's F) and clear. The whale was lifted into a flatbed truck and transported to the Charleston Laboratory, where it was received at 1830 by Wayne McFee, Debbie Wolf, Tod Leighfield, Shawn Layman, and Wendy Teas. The animal was placed on plastic on the ground, with ice placed in the bag to cover the body. Temperatures remained in the low 30's for the evening, so necropsy was performed on November 30, 1993. Level A measurements and necropsy commenced at approximately 0730 under clear skies with a temperature of approximately 55 degrees F. The animal was still a code 2 at this time. No other animal was reported stranded on November 29, 1993.

2. EXTERNAL OBSERVATIONS: (Include estimated maturity of animal, presence or absence of ectoparasites, lesions, apparent trauma or bruising, scar patterns, signs of decomposition, fisheries interaction indicators, damage due to scavengers. Examine and comment on eyes, mouth, teeth, blowhole, anal and genital slits.)

When the whale was discovered stranded alive it had blood coming from the mouth. The transportation process produced the majority of abrasions on the left side of the animal. The right side of the animal was black from mid-lateral to dorsal, and red ventrally. Identifying characteristics were: 1) approximately 2.5 cm diameter hole in the dorsal fin 2) a V-notch approximately 1 cm wide and deep in the left fluke 3) an approximately 3 cm long hole in the right fluke. An approximately 4-5 cm diameter piece of apparent scar tissue was removed from the right mid-lateral side, posterior of the dorsal fin and preserved in formalin. Swabs of the anus and blowhole were taken for virology and bacteriology analysis and sent to Roche Biomedical Laboratories. No ectoparasites were discovered. Black excretory material was exuding from the anus. The genital region appeared normal. The tongue and mouth appeared normal. The eyes were bloody. The blowhole was free of parasites. The teeth were counted and determined to be 13 left lower and 14 right lower. No teeth were in the upper jaw. There was no evidence of scavenging. Photographs were taken.

3. INTERNAL OBSERVATIONS: (Include progression of necropsy, noting exactly what was observed and what measures taken during each step.)

The blubber layer was measured at three locations, mid-dorsal 23 mm, mid-lateral 28 mm, and mid-ventral 21 mm. The primary incisions were from dorsal to ventral anterior of the right flipper, and anterior to posterior along the ventral mid-line to the genital slit. Three windows were cut, one just posterior to the right flipper, a second midway between the genital and anal slits, and the third posterior of the anal slit. The right flipper and scapula were removed. The blubber layer was peeled back to expose the muscle layer. A 20 cm square piece of blubber was removed and frozen. The blubber contained encysted parasites, which were removed and preserved in formalin. There was also a substantial amount of blood in the blubber layer. A fat pad layer was observed, though it is not known what constitutes a healthy fat pad layer. Some of this fat was removed and frozen. The muscle layer was deep red in color and appeared in good condition. A sample of muscle was removed and frozen. The muscle layer was removed and the ribs pulled back to expose the lung. The right lung was smooth and pink. The edges of the lung were covered with tiny white nodules. A sample was preserved in formalin. Also present under the right lung were small nodules in a fatty layer, from which a sample was removed and preserved in formalin. When punctured, the lung expelled air and a frothing white liquid. A 3 cm square of right lung was preserved in formalin and the rest of the lung frozen. A section of larynx was removed and preserved in formalin. Also noticed at this time was an apparent parasite track in the tissue of the peritoneum. Photographs were taken.

There was no fluid in the pericardial sac. The heart was removed and appeared deep

red in color. In removing the pericardial sac, the aorta was mistakingly cut allowing blood to escape. Blood samples were quickly taken from the right ventricle and body cavity and placed in the refridgerator. The coronary artery had some surrounding fat but not substantial. The left atrium felt hardened in the top portion, as opposed to the right atrium which was smooth throughout. Each chamber was opened and determined to be void of parasites. Samples of 3 cm square were taken from each ventricle and each atrium and preserved in formalin. A section of the dorsal aorta was removed and preserved in formalin. All vessels leaving the heart appeared normal and void of parasites. The whole heart was preserved in formalin.

The liver was blue-gray in color and was smooth in texture with no apparent signs of parasite tracks. A section of liver was preserved in formalin and a large section frozen. No parasites were found in the liver when sectioned. The bile duct exuded bile when cut and was void of parasites. The liver was removed from the stomach complex. At this time the head was removed and will be discussed later.

Once the liver was removed, the distal end of the esophagus was tied-off and cut. A section of the esophagus was removed along with a questionable parasite and preserved in formalin. No food particles were found in the esophagus. The upper intestine was tied-off and cut close to the stomach. The stomach complex was removed and frozen. The chambers of the stomach appeared empty. The whole stomach will be sent to Nelio Barros of Sea World for food content and parasitic determination. The presumed spleen was blue-gray in color and flaccid, atypical of dolphins. A section of this tissue was preserved in formalin.

The kidneys appeared normal in color and texture. A 2 cm square section from both kidneys were preserved in formalin. The remaining kidneys were frozen. Both adrenals were preserved in formalin. Both testis were enlarged and approximately 45-50 cm in length, suggesting the animal was sexually mature. A section of each testis was preserved in formalin, while approximately half of each was frozen. The right epididymis was sectioned and revealed a substantial amount of white seminal fluid. A section of the epididymis was preserved in formalin and the rest frozen. The ductus deferens was pearl-white in color, and when cut open, contained large amounts of semen. The penis was pink-red in color. A section was preserved in formalin.

The intestine was sliced open at three major locations. The upper and lower intestine were mustard color upon opening. A section of each was preserved in formalin. The middle intestine was hardened and full of a black fecal material. A section of the middle intestine was preserved in formalin. The bladder was full and urine was collected and refridgerated to be analyzed. The bladder walls were smooth, and a section was preserved in formalin. An elongated tube-like structure, deep purple in color, was removed and frozen. The tissue appeared to be that of the pancreas or spleen.

As mentioned above, the head was disarticulated from the body and flensed. Both eyes were removed and preserved in formalin. Both eyes were bloody. At approximately 22 cm below each eye, in line with the lower jaw, 20 cm from the angle of the mouth, a mustard colored pus was exuding from a "pocket". Some of this substance was placed in a jar and refridgerated. The tissue surrounding the pocket was preserved in formalin. No parasites were found in the blowhole or air sinuses. The lining of the air sinuses contained polyp-like projections consistent throughout the tissue. A section was preserved in formalin. The air sinuses on the right side of the head formed a hardened cream colored mass. A

section of this hardened mass was preserved in formalin. A large section of the melon was removed and frozen. A section of the left cerebrum was removed and preserved in formalin. The posterior of the brain did not appear hemorrhagic. The whole brain was left intact in the skull and frozen. Finally, the tongue was removed and a section was preserved in formalin. No abscesses were evident on the tongue. The remaining skeleton was flensed, disarticulated into four pieces, and frozen.

4. CONCLUSIONS: (possible cause of death, apparent health of the animal, etc.)

The immediate cause of death is not known. Some observations can be considered: the appearance of white abscesses, possibly fatty deposits, on the lungs; the flaccid spleen or pancreas; hardened tissue of the left atrium; blood and urine analysis results, attached to this report. Leslie Dierauf presents normal ranges of cetacean hematology and serum chemistry values of 8 cetaceans in her book entitled, "CRC Handbook of Marine Mammal Medicine: Health, Disease, and Rehabilitation" (1990, CRC Press, Inc.). Although *Kogia breviceps* is not one of the eight mentioned, the blood results obtained from Roche were compared with the ranges of certain chemicals given in Dierauf's book. Chemicals such as creatinine, calcium, phosphorus, potassium, and BUN (blood-urea-nitrogen) were all high in the stranded *Kogia* compared with the normal ranges. High values of the above would suggest the animal had kidney disease if blood values for *Kogia breviceps* were similar to the eight species mentioned in Dierauf's book. A large regime of formalin samples will be sent to the Armed Forces Institute of Pathology for histological analysis.

5. SAMPLES RETAINED:

CHAR.REF.#	SAMPLE	USE	STORAGE
MMES 9336SC-1	blubber cyst	l	f
MMES 9336SC-2	scar tissue	h	f
MMES 9336SC-3	subdermal fat	t	z
MMES 9336SC-4	blubber	t	z
MMES 9336SC-5	muscle	t	z
MMES 9336SC-6	piece r.lung -white bumps	h	f
MMES 9336SC-7	r. lung piece	h	f
MMES 9336SC-8	nodules in fat	h	f
MMES 9336SC-9	r. lung	t	z
MMES 9336SC-10-14	Blood samples	b	r
MMES 9336SC-15	larynx	h	f
MMES 9336SC-16	l.ventricle	h	f
MMES 9336SC-17	r.ventricle	h	f
MMES 9336SC-18	l.atrium	h	f
MMES 9336SC-19	r.atrium	h	f
MMES 9336SC-20	dorsal aorta	h	f
MMES 9336SC-21	heart	t	f
MMES 9336SC-22	liver piece	h	f
MMES 9336SC-23	esophagus	h	f
MMES 9336SC-24	liver	t	z
MMES 9336SC-25	pus	b	r
MMES 9336SC-26	tissue around pus	h	f
MMES 9336SC-27	r.kidney piece	h	f
MMES 9336SC-28	r.kidney	t	z
MMES 9336SC-29	r. adrenal	h	f
MMES 9336SC-30	r. testis piece	h	f
MMES 9336SC-31	r. testis	t,b	z
MMES 9336SC-32	r. epididymis	h	f
MMES 9336SC-33	r. epididymis	t,b	z
MMES 9336SC-34	l. kidney	h	f
MMES 9336SC-35	l. testis	h	f
MMES 9336SC-36	l.testis	t,b	z
MMES 9336SC-37	l.kidney	t	z
MMES 9336SC-38	spleen	h	f
MMES 9336SC-39	r.eye	h	f
MMES 9336SC-40	stomach	l	z
MMES 9336SC-41	l.adrenal	h	f
MMES 9336SC-42	upper intestine	h	f
MMES 9336SC-43	middle intestine	h	f
MMES 9336SC-44	lower intestine/rectum	h	f
MMES 9336SC-45	l.lung	h	f

MMES 9336SC-46	urine	b	r
MMES 9336SC-47	bladder	h	f
MMES 9336SC-48	penis	h	f
MMES 9336SC-49	spleen/pancreas ?	t	z
MMES 9336SC-50	air sinus	h	f
MMES 9336SC-51	air sinus growth	h	f
MMES 9336SC-52	melon	t,b	z
MMES 9336SC-53	l.eye	h	f
MMES 9336SC-54	l.cerebrum	h	f
MMES 9336SC-55	tongue	h	f
MMES 9336SC-56	skull/skeleton	l,s	z
MMES 9336SC-57	anaerobic cultures		r

Key to Use/Storage codes:

f=preserved in formalin; z=frozen; r=refridgerated; b=biochemical analysis; h=histopathology; l=life history; t=toxicology; s=skeletal archive

DEPARTMENT OF DEFENSE
ARMED FORCES INSTITUTE OF PATHOLOGY
WASHINGTON, DC 20306-6000

REPLY TO ATTENTION OF

PATIENT IDENTIFICATION		PLEASE USE AFIP ACCESSION NUMBER IN ALL CORRESPONDENCE
AFIP ACCESSION NUMBER 2434966-4	CHECK DIGIT	SEQUENCE 00
NAME ANIMAL, CETACEA WHALE SC-93-42 T DR MCFEE		SSAN
SURGICAL/AUTOPSY PATH ACCESSION #'S		
PLEASE INFORM US OF ANY PATIENT IDENTIFICATION ERRORS		

TPL/LKJ/KES/dyj

Mr. Wayne McFee
National Marine Fisheries Service
217 Ft. Johnson Road
Charleston, SC 29412

DATE: 28 February 1994

CONSULTATION REPORT ON CONTRIBUTOR MATERIAL

AFIP DIAGNOSIS: SC93-42 1. Liver: Congestion, centrilobular, diffuse, severe, with hepatocellular atrophy, pygmy sperm whale (Kogia breviceps), cetacean.
2. Right atrium and right ventricle: Fibrosis, multifocal, mild.
3. Spleen: Congestion, diffuse, moderate.
4. Rectum: Proctitis, ulcerative, lymphoplasmacytic, multifocal, moderate, with intralesional adult cestodes, morphologically compatible with the family tetrabothriidae.
5. Intestine and rectum: Hemorrhage, intraluminal, diffuse, mild to moderate.
6. Right and left lung: Congestion and edema, multifocal to coalescing, mild to moderate.
7. Right and left kidney: Congestion, multifocal, mild to moderate.
8. Lymph nodes, site unspecified: Congestion and hemorrhage, multifocal, mild, with mild hemosiderosis.
9. Skin, site unspecified, panniculus adiposes: Cestode larva.
10. Skin, site unspecified: Granuloma, focal.
11. Trachea, submucosa: Tracheitis, subacute, multifocal, mild.
12. Right eye (per contributor): Conjunctivitis, subacute, focally extensive, mild.
13. Air sinus (per contributor): Sinusitis, neutrophilic, subacute, diffuse, mild.
14. Liver, hepatocytes: Fatty change, diffuse, mild.
15. Right lung (per contributor), pleura: Fibrosis, multifocal, mild.
16. Skin: Dermal fibrosis, chronic, focally extensive, moderate, with mild epidermal hyperplasia.
17. Feces: Strongyle eggs, multiple.

2434966-4 00
ANIMAL, CETACEA WHALE
SC-93-42 T DR MCFEE

COMMENT: This case was reviewed by the Departments of Veterinary Pathology and Cardiovascular Pathology. The hepatic and cardiac changes suggest the possibility of cardiomyopathy as has been described in this species; however, examination of the gross heart specimen would be necessary to reach a more definite conclusion. Congestion and hemorrhage noted in several organs were probably caused by terminal cardiovascular collapse. Your necropsy description of black ingesta and excretory material was found to be intraluminal intestinal and rectal hemorrhage; however, the cause of the hemorrhage is not apparent. The rectal cestode is tentatively classified as a member of the family tetrabothriidae. Eggs of a strongyle nematode are also present in fecal material, although no adult worms were seen. The cause of the cutaneous granuloma may be parasitism. The unusual blood chemistry and hematology findings are attributed to postmortem changes. We recommend bacterial culture of blood samples obtained from the right heart after death to aide in the diagnosis of septicemia. Hematology and blood chemistry are useful only if obtained from live animals.

Thank you for submitting this interesting case to the Registry of Veterinary Pathology.

The following report may be of interest to you:

Bossart GD, Odell DK, Altman NH: Cardiomyopathy in stranded pygmy and dwarf sperm whales. JAVMA 1985, 11;1137-1140.

T P Lipscomb

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CHARLESTON LABORATORY
MARINE MAMMALS & PROTECTED SPECIES PROJECT
NECROPSY NOTES

DATE: December 9, 1993

SPECIES AND SEX: *Kogia breviceps*; Male

LOCATION AND DATE OF STRANDING: Otters Island, SC; 12/6/93

SEUS STRANDING NETWORK INFORMATION: SC 9344; MMES 9338SC

LOCATION OF NECROPSY: NMFS/Charleston Laboratory

LEVEL A DATA COLLECTED BY: Wayne McFee, Debbie Wolf, David Carter

NECROPSY TEAM MEMBERS: Wayne McFee, Debbie Wolf, Connie Sears, Tod Leighfield

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NECROPSY NOTES

1. GENERAL COMMENTS: (Include species, total length, sex, whether single or multiple occurrence, condition code, exact location of stranding, air and water temperature, other weather conditions.)

This 282 cm, code 2, adult pygmy sperm whale was first discovered alive by a shrimp boat at approximately 1100h on December 6, 1993. By the time John Coker, SCWMRD, arrived on Otters Island, SC the animal had expired, at approximately 1500. The weather conditions were clear and cool, with a temperature in the low 60's. The whale was towed by John Coker back to Bennett's Point Landing, where it was loaded into the NOAA flatbed truck for transport to the Charleston Laboratory. Once at the Charleston Laboratory (1800h), the animal was placed on the ground and covered in plastic and ice. Temperatures were to drop into the low 40's at night so the necropsy was performed on December 7, 1993. Level A measurements and necropsy commenced at 0800h under clear skies with a temperature of approximately 55 degrees F. The animal was still a code 2 at this time. This animal was one of two cetaceans reported stranded on December 6, 1993.

2. EXTERNAL OBSERVATIONS: (Include estimated maturity of animal, presence or absence of ectoparasites, lesions, apparent trauma or bruising, scar patterns, signs of decomposition, fisheries interaction indicators, damage due to scavengers. Examine and comment on eyes, mouth, teeth, blowhole, anal and genital slits.)

This mature adult male was discovered on the beach with its jaw broken and necrotic. Some teeth were presumed missing since the tooth count was low, specifically, 10 left lower and 8 right lower. The eyes were clear and normal. The animal was black dorsally and white ventrally with a mottled pattern laterally. Small raised lesions were removed from the dorsal, 28 cm posterior of the dorsal fin. This sample was preserved in formalin. The right flipper was characterized by a notch, 2.5 cm X 2.8 cm. The region of the sternum appeared to be bulging, possibly broken. There was pronounced bruising between the genital and anal slits. The rostrum was not completely flat, rather it had a slight ridge medially. No ectoparasites were discovered. The genital and anal slits appeared normal. Swabs of the anus, genital slit, and blowhole were sent to Roche Biomedical Laboratory for virology and bacteriology analysis. There was no evidence of scavenging. Photographs were taken.

3. INTERNAL OBSERVATIONS: (Include progression of necropsy, noting exactly what was observed and what measures taken during each step.)

The blubber layer was measured at three locations, mid-dorsal 20 mm, mid-lateral 24 mm, and mid-ventral 33 mm. The primary incisions were made from dorsal to ventral anterior of the right flipper, and anterior to posterior along the ventral mid-line to the genital slit. Three windows were cut, one just posterior to the right flipper, a second midway between the genital and anal slits, and the third posterior of the anal slit. The right flipper and scapula were removed. As the incisions were being made, encysted parasites in the blubber layer would "pop". These parasites were numerous throughout the blubber layer over the entire body. A section of blubber and parasite was preserved in formalin. The blubber layer was peeled back to expose the muscle layer. A 20 cm square piece of blubber was taken from the mid-lateral of the first window and frozen. The blubber appeared slightly hemorrhagic, especially dorsally. There was a substantial amount of subdermal fat, some of which was removed and frozen. The muscle was dark red in color. A section of muscle was removed from the ventral just to the right of mid-line and frozen. The muscle layer was removed and the ribs pulled back to expose the thoracic cavity. The first rib appeared deformed at the connection with the sternum, and seemed to be pushing on the heart, or, the heart was enlarged and was pushing against the sternum. Something appeared abnormal in this region. Once the bones are cleaned by the dermestid beetles it should be easier to see if the first right rib was indeed deformed.

The right lung was heavily bruised anteriorly and posteriorly, deep red in color, and bumpy. The lung appeared to have a fat layer covering the posterior section and over the visceral peritoneum. A section was preserved in formalin. There also appeared to be parasite tracks and nodules on the exterior surface of the lung. White bumps also appeared posterior and ventral on the lung. A section of the white bumps and lung tissue was

preserved in formalin. When punctured, the lung collapsed causing air to escape and white froth to exude. A 3 cm square section of this hemorrhagic lung with froth and parasites was removed and preserved in formalin. One half of the lung was frozen. The remaining lung was removed to provide better access to the heart. The left lung was similar to the right in color and texture. A section of the left lung was preserved in formalin. The bronchi were foaming white. A section of the right bronchus was preserved in formalin.

The pericardial sac had some fluid, but not substantial. Blood samples were taken from the left ventricle and right atrium via a needle, and by cutting the atrium open and "pumping" the blood directly into the tubes. We have not been having great success in obtaining blood via needles. Blood was collected in sodium heparin, SST, plain, and EDTA tubes and refrigerated before transport to Roche Biological Laboratories. Results have been received and are on file. The heart was brownish-red in color. The atria appeared similar in texture. Sections (2 cm square) were removed from each atrium and ventricle and preserved in formalin. No parasites were observed in any chamber. The whole heart was removed and preserved in formalin. The walls of the dorsal aorta appeared normal. A section of the dorsal aorta was removed and preserved in formalin.

Once the heart was removed, the distal end of the esophagus was tied-off and cut. No food was in the esophagus. Also at this time, the head was disarticulated from the body and flensed. This will be discussed later. The peritoneum was cut opened to expose the liver. The liver was blue-gray in color, had a smooth exterior, and appeared enlarged. No parasites were discovered when the liver was sectioned. A 3 cm square section of liver was preserved in formalin. A large section of liver from the right side was frozen. The remaining liver was cut from the stomach.

The mesentery around the intestines appeared fatty. The upper intestine was tied-off and cut in order to remove the stomach complex. There were no exterior lesions on the stomach complex. The stomach appeared to be slightly filled with fluid, but otherwise empty of solid food. The stomach complex was removed and frozen. At the base of the stomach complex, but not attached to, was an elongated purplish structure assumed to be spleen or pancreas. A section of this tissue was preserved in formalin, while the remains were frozen. The upper intestine appeared greenish- to light brown in color. A green mucousal substance was discovered in this region. A section of the upper intestine was preserved in formalin. The mid-intestine was hard and upon opening contained black excretory material. A piece of the mid-intestine was preserved in formalin. The lower intestine was red in color and contained some black fecal material. A section of the rectum was preserved in formalin. A lymph node (?) was removed from the mesentery near the rectum and preserved in formalin. An adult parasite was removed from the mesentery near the rectum and preserved in formalin.

The kidneys appeared normal in color, though separation between glomeruli appeared in the right kidney. Some glomeruli of both kidneys appeared yellow in color, seemingly occluded. A 2 cm section of each kidney was preserved in formalin, while the remains of each kidney were frozen.

The testes were measured to be 50 cm in length, suggesting that this animal was sexually active prior to death. A section of each testis was preserved in formalin while a small section of the right testis was frozen. Both were bluish-white in color. A nodule was removed from the right lateral side dorsal to the right testis and preserved in formalin. A possible parasite was removed from the mesentery near the left testis. The epididymis of

both testes were whitish in color, and when cut, exuded semen. A section from each was preserved in formalin. Both ductus deferens were white in color and full with semen. A section of each was preserved in formalin. The anterior end of the penis, approximately 10 cm, was preserved in formalin. A nodule was removed at the base of the penis and preserved in formalin. Finally, the bladder was full and a urine sample was collected for analysis. The walls of the bladder appeared normal, and a section was preserved in formalin.

As mentioned above, the head was removed and flensed. This animal was loaded with adult parasites, some 20 cm or more in length, coming from all regions of the head. Parasites were collected from the following areas: 1) mid-lateral just posterior to the right eye 2) approximately 8 inches posterior of the nasal openings embedded in muscle 3) muscle tissue posterior of the nasal cavity 4) in or near the left ear. The right side of the nasal air sac seemed to be blocked with fat, similar to that found in the melon. A section of the surrounding tissue was preserved in formalin. A mustardy, pus-like substance was removed with surrounding tissue from the right side of the head and preserved in formalin. A section of the melon was removed and frozen. Both eyes appeared clear and normal. Each was removed and preserved in formalin, the left eye being slit. A section of the left cerebrum was removed and preserved in formalin. The whole brain was left in the skull and frozen. The tongue was devoid of any lesions or abnormalities. A section was preserved in formalin.

4. CONCLUSIONS: (possible cause of death, apparent health of the animal, etc.)

The immediate cause of death is unknown. However, some observations can be noted. The extremely heavy load of parasites throughout the body and skull would suggest that this animal was chronically ill. The sheer number of parasites in the skull may have been a contributing cause of death. The unusual occlusion of the air sinuses by fat would have made breathing difficult for this animal, and it is not known why the fat had invaded these areas. The fact that the broken jaw was necrotic at the time of discovery would suggest that the animal had this wound while alive, probably making it difficult to eat. Other observations worthy of note were that the presumed glomeruli of the kidneys appeared to be occluded, and that the chest cavity did not appear to be normal. Further visual analysis of the sternum and ribs may confirm this. Blood samples and swabs were sent to Roche Biomedical Laboratories. A large regime of formalin samples will be sent to the Armed Forces Institute of Pathology for histology. Photographs were taken throughout the necropsy.

5. SAMPLES RETAINED:

CHAR.REF.#	SAMPLE	USE	STORAGE
MMES 9338SC-1	lesion dorsal	h	f
MMES 9338SC-2	blubber	t	z
MMES 9338SC-3	subdermal fat	t	z
MMES 9338SC-4	muscle	t	z
MMES 9338SC-5	blubber w/ parasites	l	g/a
MMES 9338SC-6	EDTA blood	b	r
MMES 9338SC-7	fatty tissue r. lung	t	f
MMES 9338SC-8	r. lung section w/ parasite	l	f
MMES 9338SC-9	r. lung w/ bumps	h	f
MMES 9338SC-10	r. lung	t,b	z
MMES 9338SC-11-17	blood	b	r
MMES 9338SC-18	bronchus tube piece	h	f
MMES 9338SC-19	r. atrium	h	f
MMES 9338SC-20	l. atrium	h	f
MMES 9338SC-21	l. ventricle	h	f
MMES 9338SC-22	r. ventricle	h	f
MMES 9338SC-23	dorsal aorta	h	f
MMES 9338SC-24	heart	l	f
MMES 9338SC-25	esophagus	h	f
MMES 9338SC-26	piece liver	h	f
MMES 9338SC-27	liver	t	z
MMES 9338SC-28	parasites skull	l	g/a
MMES 9338SC-29	nodule near testis	h	f
MMES 9338SC-30	muscle parasites-skull	l	g/a
MMES 9338SC-31	nasal cavity parasites	l	f
MMES 9338SC-32	stomach complex	l	z
MMES 9338SC-33	l. lung piece	h	f
MMES 9338SC-34	r. kidney piece	h	f
MMES 9338SC-35	r. kidney	t	z
MMES 9338SC-36	spleen/pancreas ?	h	f
MMES 9338SC-37	r. eye	h	f
MMES 9338SC-38	spleen/pancreas ?	t	z
MMES 9338SC-39	l. eye	h	f
MMES 9338SC-40	thymus ?	h	f
MMES 9338SC-41	l. kidney piece	h	f
MMES 9338SC-42	r. epididymis	h	f
MMES 9338SC-43	melon	t	z
MMES 9338SC-44	r. air sac	h	f
MMES 9338SC-45	r. testis	h	f
MMES 9338SC-46	mid intestine	h	f
MMES 9338SC-47	upper intestine	h	f

MMES 9338SC-48	r. testis	t	z
MMES 9338SC-49	pus-like sac	h	f
MMES 9338SC-50	urine	b	r
MMES 9338SC-51	bladder	h	f
MMES 9338SC-52	parasites near ear	l	f
MMES 9338SC-53	r. ductus deferens	h	f
MMES 9338SC-54	rectum	h	f
MMES 9338SC-55	l.testis	h	f
MMES 9338SC-56	l. epididymis	h	f
MMES 9338SC-57	l. ductus deferens	h	f
MMES 9338SC-58	parasite near l. testis	l	f
MMES 9338SC-59	lymph node rectum	h	f
MMES 9338SC-60	parasite near rectum	l	f
MMES 9338SC-61	cerebrum	h	f
MMES 9338SC-62	penis	h	f
MMES 9338SC-63	tongue	h	f
MMES 9338SC-64	gland? near penis	h	f

Key to Use/Storage codes:
f=preserved in formalin; z=frozen; r=refrigerated; b=biochemical analysis;
h=histopathology; l=life history; t=toxicology; s=skeletal archive; g/a=glycerin/alcohol

DEPARTMENT OF DEFENSE
ARMED FORCES INSTITUTE OF PATHOLOGY
WASHINGTON, DC 20306-6000

REPLY TO ATTENTION OF

PATIENT IDENTIFICATION		PLEASE USE AFIP ACCESSION NUMBER IN ALL CORRESPONDENCE
AFIP ACCESSION NUMBER 2434968-0	CHECK DIGIT	SEQUENCE 00
NAME ANIMAL, CETACEA WHALE SC93-44 T		SSAN
SURGICAL/AUTOPSY PATH ACCESSION #'S		
PLEASE INFORM US OF ANY PATIENT IDENTIFICATION ERRORS		

TPL/REB/mab

Mr. Wayne McFee
National Marine Fisheries Service
217 Ft. Johnson Road
Charleston, SC 29412

DATE: 11 March 1994

CONSULTATION REPORT ON CONTRIBUTOR MATERIAL

AFIP DIAGNOSIS: SC-93-44 1. Heart, right ventricular myocardium: Myofiber atrophy, multifocal, moderate, pygmy sperm whale (Kogia breviceps), cetacean.
2. Heart, left ventricular myocardium: Myofiber atrophy, multifocal, mild.
3. Liver: Congestion, centrilobular, diffuse, severe, with hemosiderosis and hepatocyte atrophy.
4. Spleen; kidney: Congestion, acute, diffuse, severe.
5. Brain, cerebellum: Congestion, acute, diffuse, mild.
6. Lungs, bilateral: Congestion, acute, diffuse, moderate, with intra-alveolar edema and hemorrhage.
7. Tongue, skeletal muscle: Myofiber degeneration and necrosis, multifocal, mild, with multifocal myofiber regeneration.
8. Mucosa, right air sac (per contributor): Hyperplasia, papillary and cystic, diffuse, moderate, with stromal fibrosis.
9. Skin, dorsal fin (per contributor): Papilloma.
10. Liver, hepatocytes: Eosinophilic bodies, diffuse, mild.
11. Small intestine, lumen: Metazoan parasite eggs.
12. Fibroadipose tissue and skeletal muscle (site unspecified): Granuloma, with adult metazoan parasite.
13. Lung, right: Adipose tissue, subpleural, multifocal.
14. Parasites (site unspecified): Larval cestodes (coenurui).
15. Skeletal muscle, near testis (per contributor): Granuloma, with cestode larva (coenurus).
16. Accessory sex gland; penis; epididymis; testis; fibroadipose tissue with multiple arteries; eye: Within normal limits.

COMMENT: The histopathologic finding of cardiac myofiber atrophy combined with severe centrilobular hepatic congestion indicates that the cause of death was cardiomyopathy, a recognized cause of stranding in pygmy sperm whales. In your necropsy report, you mentioned the possibility of cardiac enlargement. The acute congestion of several other tissues is a nonspecific terminal change. The papillary and

cystic hyperplasia of the air sac is unusual in our experience but clinically insignificant. Papillomas have been reported in whales; no evidence of a viral etiology was apparent histologically. The parasites found in various tissues are common findings in whales. The gland at the base of the penis that you mentioned in your necropsy report was an accessory sex gland, possibly prostate. A tissue that you suspected to be thymus was found to consist of adipose tissue and several arteries; this may be a vascular rete. Your observation of a fat layer covering the right lung was confirmed histologically; the fat was subpleural. The white bumps that you observed were also subpleural nodules of fat. These findings are also unusual in our experience. The other lesions listed above are incidental findings. The significance of the fractured mandible is unclear; since the whale did not seem to be emaciated, the fracture probably occurred a relatively short time prior to death. We greatly appreciate the detailed necropsy report and extensive sampling of tissues. It is gratifying to have sufficient information and pathologic material to make specific diagnoses and determinations regarding cause of death.

Thank you for submitting this interesting case to the Registry of Veterinary Pathology.

T P Lipscomb

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Chief, Division of Veterinary
Pathology

CHARLESTON LABORATORY
MARINE MAMMALS & PROTECTED SPECIES PROJECT
NECROPSY NOTES

DATE: December 14, 1993

SPECIES AND SEX: *Stenella frontalis*; Female

LOCATION AND DATE OF STRANDING: offshore gill net fishery, N.C.

SEUS STRANDING NETWORK INFORMATION: WHOI 340; MM 1-44(B)

LOCATION OF NECROPSY: USC-Beaufort, S.C.

LEVEL A DATA COLLECTED BY: Wayne McFee, Debbie Wolf, Mike Walker (network volunteer), Nancy Weckhorst (network volunteer)

NECROPSY TEAM MEMBERS: Wayne McFee, Debbie Wolf, Mike Walker

NECROPSY NOTES

1. GENERAL COMMENTS: (Include species, total length, sex, whether single or multiple occurrence, condition code, exact location of stranding, air and water temperature, other weather conditions.)

This 184.2 cm, early code 3, adult female spotted dolphin was taken in a gill net fishery off of the North Carolina coast sometime in late 1991 or early 1992. The animal was donated by Bill Bowen, NMFS-Beaufort, N.C., to the Charleston Laboratory on March 11, 1992 for training purposes. The Woods Hole Oceanographic Institute had initially stored the animal with the NMFS in North Carolina. The animal was removed from the freezer at the Charleston Laboratory on December 9, 1993 to thaw. The animal was transported to the University of South Carolina at Beaufort, South Carolina on December 11, 1993 to be used in training session for SEUS network volunteers. Level A measurements and necropsy commenced at 1000 am in the USC-B wetlab. This was one of three animals donated on March 11, 1992.

2. EXTERNAL OBSERVATIONS: (Include estimated maturity of animal, presence or absence of ectoparasites, lesions, apparent trauma or bruising, scar patterns, signs of decomposition, fisheries interaction indicators, damage due to scavengers. Examine and comment on eyes, mouth, teeth, blowhole, anal and genital slits.)

This animal was heavily spotted, with the spots being very distinct, characteristic of adults. A hook-shaped cut approximately 2 cm long was observed 20 cm anterior of the genital slit, mid-lateral. There was a lot of bruising on the throat region. A rope mark was evident extending from the right mid-lateral just posterior to the right flipper up to almost the blowhole. Most of the right side of the animal was freezer burned from laying on the floor in the freezer. The teeth were slightly worn and a few were missing. The teeth were counted and determined to be 31/3 left upper, 31/4 right upper, 31 left lower, and 30 right lower. Ectoparasites were not found. The tongue and mouth appeared normal. The eyes were red and bloody. The blowhole was free of parasites. There was no evidence of scavenging. Photographs were taken.

3. INTERNAL OBSERVATIONS: (Include progression of necropsy, noting exactly what was observed and what measures taken during each step.)

A dorsal fin clip was taken for W.H.O.I. and frozen. The blubber layer was measured at three locations, mid-dorsal 11 mm, mid-lateral posterior to the dorsal fin 11 mm (right side was too freezer burned laterally to take mid-lateral measurement in usual place), and mid-ventral 10 mm. The primary incisions were made from dorsal to ventral anterior of the right flipper, and anterior to posterior along the ventral mid-line to the genital slit. Two windows were made to peel back the blubber layer, one just anterior to the dorsal fin and one just posterior to the dorsal fin. The right flipper and scapula were removed and frozen. The blubber layer was peeled back to expose the muscle layer. Encysted parasites were discovered in the blubber layer. A section of a parasite and blubber from the ventral side was preserved in formalin. A 10 cm square piece of blubber was removed from the right mid-lateral side just posterior of the insertion of the flipper and frozen. While creating the second window, the mammary gland was cut through. The animal was not lactating at the time. No parasites were found in the mammary tissue. A section of this tissue was removed and frozen. The animal had a minimal subdermal fat layer. The muscle tissue and surrounding fascia was, in places, beginning to turn green. The majority of the muscle tissue, however was deep red in color. A section of muscle was removed and frozen.

The muscle layer was removed and the ribs pulled back to expose the thoracic cavity. The right lung contained impressions of the ribs, presumably from the animal laying on its right side for so long. The lung was pink-orange in color with deep red discoloration in some places. The pulmonary lymph node was a pale pink color and contained fibrin tags on the edge of the node. A 3 cm square section of the lung was removed and preserved in formalin. The lung was frothing and hemorrhagic throughout. Bronchioles were free of parasites. A large section of the right lung was removed and frozen. The remains of the right lung were removed and discarded to better access the heart. The heart appeared deep

red in color with very little fat surrounding the coronary artery. There was no fluid in the pericardial sac. The vessels of the heart were cut to remove the heart. Sections (2 cm square) were taken from each atrium and ventricle and preserved in formalin. No parasites were discovered in any chamber. The whole heart was placed in a plastic zip-lock bag and frozen. The dorsal aorta appeared to be normal in wall thickness. No parasites were discovered here also. Once the heart was removed a sternal(?) lymph node was discovered just dorsal to the sternum. This node was removed and frozen.

After the heart was removed, the esophagus was tied-off and cut at the distal end. Fish bones were discovered in the esophagus, removed and frozen. The head was then disarticulated from the body and flensed by Mike Walker. This will be discussed at a later time. The visceral peritoneum was cut open to expose the liver, stomach and intestines. The liver was two colors. The top half was gray-brown and the bottom a deep red in color. No parasites were discovered when the liver was cut into. A section of the liver was frozen. The left side of the liver on the ventral contained encysted parasites. A section of parasites and liver was preserved in formalin. The remains of the liver was cut away from the stomach complex. It was also noted that there was an abnormal amount of pooled blood in the abdominal cavity.

The upper intestine was tied-off and cut proximal to the stomach. The stomach was full and no unusual discoloration or lesions were seen. The whole stomach complex was removed and frozen to be sent to Nelio Barros at Sea World. The spleen appeared normal in color and texture. A mini-spleen was removed along with the main body of spleen and frozen. No parasites were discovered internally. The pancreas appeared a normal whitish color externally, but was hemorrhagic internally. The pancreas was removed and frozen. Once the stomach complex was removed, the right kidney was exposed and appeared normal in color and texture. Upon opening the some glomeruli appeared occluded. The left kidney had the same appearance. Both kidneys were removed and frozen, along with the right adrenal gland.

The intestines were normal pinkish in color. The intestines were checked at various places for color, excretory material, and abnormalities. The whole intestinal tract contained a continuous amount of milky brown fecal material. One section of the mid-intestine appeared to be hemorrhagic. The bladder initially appeared to be full by touch. When cut, though, it was discovered that the walls of the bladder were approximately 1 cm thick and rigid. A fibrin tag was also noticed on the exterior of the bladder. The bladder was removed and frozen.

The reproductive tract was removed and was fully developed. The left ovary was larger than the right and contained three external cysts (did not look parasitic). A lymph node (?) was removed along with the uterus and frozen with the reproductive tract.

Finally, as mentioned above, the head was removed and flensed. A section of the melon was removed and frozen. No parasites were discovered in the air sinuses or skull muscle. The brain appeared hemorrhagic. A piece of the brain was preserved in formalin while the rest remained in the skull for later extraction. The skeleton was then flensed and returned along with the skull to the Charleston Laboratory.

4. CONCLUSIONS: (possible cause of death, apparent health of the animal, etc.)

The cause of death was assumed to be from drowning in the gill net. The condition of the lungs would support this. Other observations worthy of note: the thick-walled bladder; fibrin tags on the bladder and pulmonary lymph node; cysts on the exterior surfaces of the liver and left ovary.

NOTE: Formalin sampling was for demonstration purposes only. Formalin samples were taken of each major tissue but discarded because the animal had been frozen prior to necropsy. Therefore, no samples will be sent to the Armed Forces Institute of Pathology.

5. SAMPLES RETAINED:

CHAR.REF.#	SAMPLE	USE	STORAGE
MM1-44B-1	dorsal fin clip	l	z
MM1-44B-2	parasite in blubber	l	f
MM1-44B-3	blubber	t	z
MM1-44B-4	mammary tissue	b	z
MM1-44B-5	muscle	t	z
MM1-44B-6	r. lung piece	h	f
MM1-44B-7	r. lung	t	z
MM1-44B-8	sternal lymph node	t,b	z
MM1-44B-9	l. ventricle	h	f
MM1-44B-10	heart	t	z
MM1-44B-11	fish bones	l	a
MM1-44B-12	brain	h	f
MM1-44B-13	melon	t,b	z
MM1-44B-14	liver	t	z
MM1-44B-15	r. adrenal gland	t,b	z
MM1-44B-16	r. kidney	t	z
MM1-44B-17	lymph node mesentery	t,b	z
MM1-44B-18	repro. tract	l	z
MM1-44B-19	bladder	l	z
MM1-44B-20	l. kidney	t	z
MM1-44B-21	parasites in liver	l	g/a
MM1-44B-22	spleen	t,b	z
MM1-44B-23	pancreas	t,b	z
MM1-44B-24	stomach complex	l	z
MM1-44B-25	skull, skeleton	l	s