

Evaluation of Propeller Cuts Documented in Right Whale Necropsy

Field No.: DVS 2006-04745

By

**James L. Wood
Lumatrex, Inc.**

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The condition of the carcass shown in the photographs of necropsy DVS 2006-04745 made it very difficult to for the necropsy team to provide accurate or even consistent measurements. The measurements taken in situ and those take after the blubber layer with the propeller cuts was removed differ considerably. Also, the photographs were not suitable for a complete analysis. These factors make it impossible to provide a complete evaluation; however, it is possible to provide some general insights as well as approximations based on the range of measurements taken. Numbers provided here are not intended to reflect any degree of precision. Most calculated values have been reported as whole numbers. This includes conversions from metric to English measures. This is intended to reflect the general nature of the evaluation based on measurements taken from a badly decomposed carcass. The general observations are as follows:

1. This was a significant strike with deep propeller and rudder cuts.
2. The longest cut in the series, Cut #7, was approximately 61 cm (24 inches) long, which establishes that the propeller must have been at least 25 inches in diameter.

The necropsy team's recollection that all of the observed cuts penetrated the 12 cm to 15 cm blubber layer does not support the determination that the propeller was 25 inches in diameter or larger. A larger diameter propeller will create a shallower cut for any given cut length. For a 25 inch propeller, cuts 10, 11, 12, and 13 would have depths of only 9, 8, 3, 0.6 cm respectively. This is an apparent contradiction which cannot explained based on the available data.

Only a propeller 25 inches or larger in diameter could have produced a 24 inch long cut on this animal's back, but a propeller 30 inches in diameter would have produced cuts less than 5 cm deep for each of the last several cuts on each end of the series. Therefore, the best approximation of the propeller diameter is between 25 and 30 inches - probably closer to 25 inches.

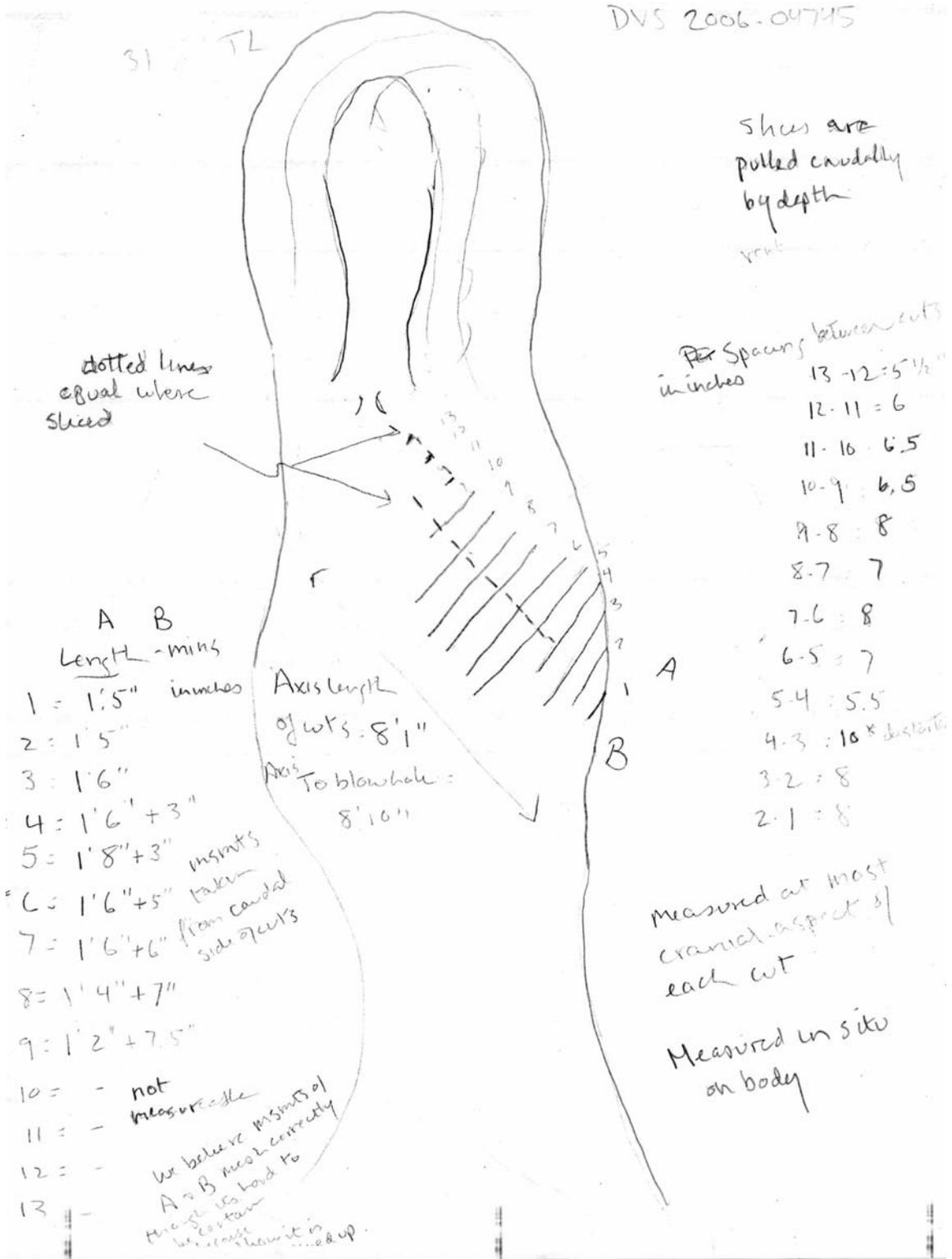
3. The propeller rotated counterclockwise (CCW). This is most common on the port propeller of a twin propeller vessel. Though it is possible for a starboard engine or a vessel equipped with a single propeller to have a propeller that rotates CCW, it is unusual.

4. A cut running the length of the cut series transects cuts #4 through #10 but not cuts #1 through #3 or cuts #11 through #13. This indicates that this cut was probably created by an unsupported rudder positioned behind the propeller. Also, the bottom edge of the rudder was probably positioned above the lowest point of the propeller's rotation. This is also characteristic of an unsupported rudder.
5. Items 2 through 4 above would tend to indicate a vessel 40 to 50 feet in length. The length of 40 to 50 feet is a very rough approximation. It is entirely possible that the vessel was larger than this range, but it probably was not much smaller.
6. The cut spans for the two sets of measurements of cuts #1 through #9 vary widely. The cut spans measured in situ for this region range from 5.5 inches to 10 inches. The type of vessel indicated by all of the other data will not normally create cut spans greater than 6.5 to 7 inches. Also, the photos of the carcass illustrate the difficulty of taking in situ measurements in this region of the cuts. Therefore, the in situ cut span measurements cannot be considered very reliable. The measurements of cut span in this region taken after the blubber layer was removed are more consistent with the other data.
7. If the animal was "upright" in the water when it was struck, the deepest cuts should occur near the animal's dorsal midline at the approximate position of cut #13. Also, there would probably be cuts on either side of the midline. The deepest cut, #7, is positioned approximately halfway between the animal's dorsal midline and its right lateral line, and none of the cuts occur on the left side of the animal's dorsal midline. This would indicate that the animal was positioned slightly on its left side with its upper right quadrant nearest the surface when it was struck.
8. The approach of the vessel cannot be established with any reasonable certainty. If the vessel approached from the animal's left-front, the animal must have been rolling to its left side before the vessel struck. This could be interpreted as a possible attempt by the animal to avoid the approaching vessel, but this is highly speculative. If the vessel approached from the animal's right-rear, the animal may have been rolled to its left side by the impact of the collision or it may have already been positioned on its left side for some unrelated reason. These possibilities are also very speculative.
9. The range of the probable cut depth for each cut, based on a 25 inch diameter propeller, is listed below. The calculated ranges are based on the two measurements of cut lengths provided. It should be noted that these numbers provide a false impression of precision. These are simply calculated values and should be considered as only approximations which are no more reliable than the original cut lengths.

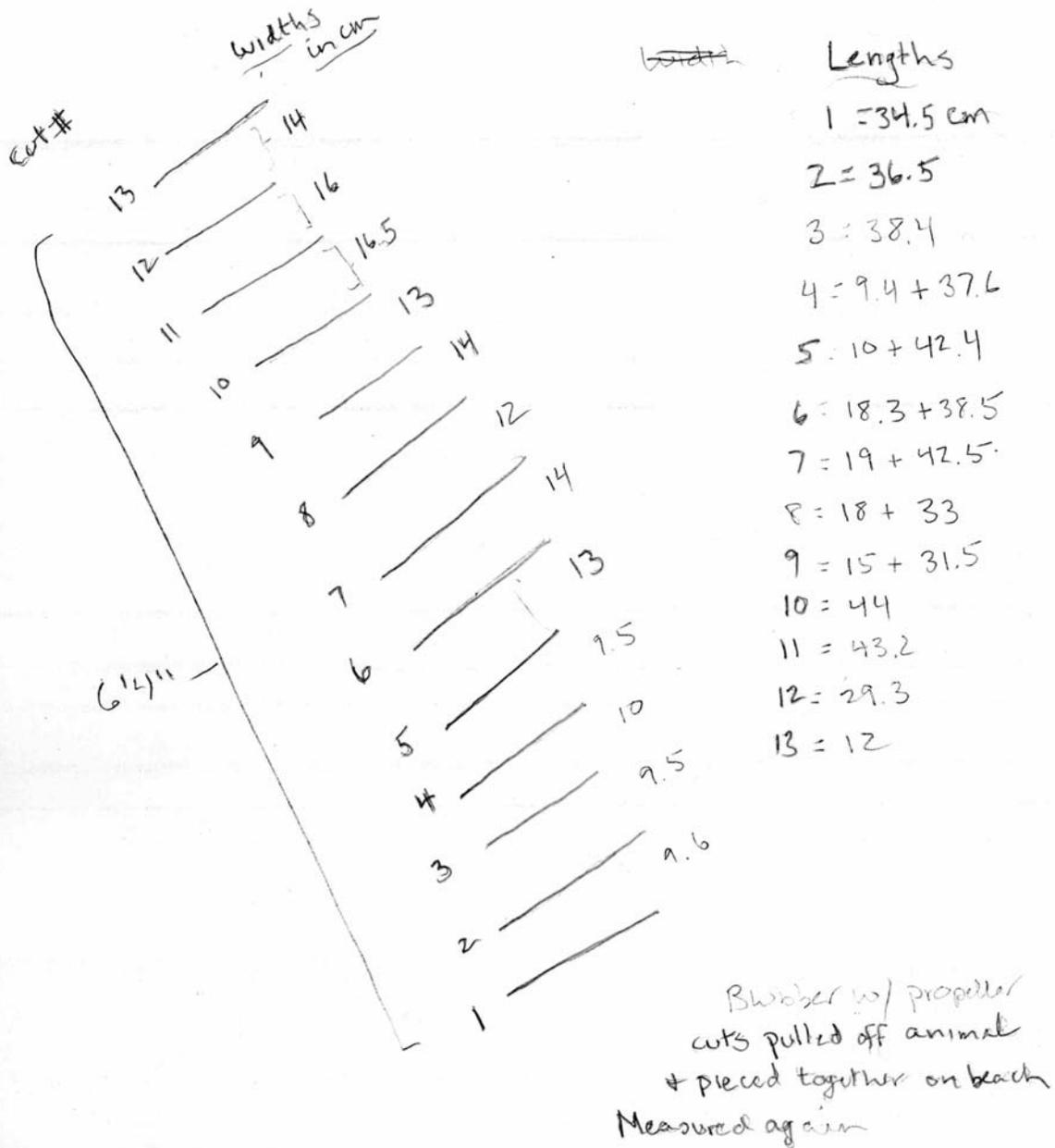
<u>Cut#</u>	<u>Depth (cm)</u>
1	5 - 9
2	6 - 9
3	6 - 10
4	10 - 14
5	14 - 19
6	17 - 19
7	23 - 22
8	13 - 19
9	10 - 15
10	9
11	8
12	4
13	1

James L. Wood
Lumatrex, Inc.
P. O. Box 510129
Melbourne Beach, FL 32951
321-956-1939
jlwood@lumatrex.com

Note: Drawings and Photos follow



Drawing 1: Necropsy Notes – Page 1 of 2



Drawing 2: Necropsy Notes – Page 2 of 2



Photo 1: Propeller Cuts - In Situ (IMG_1304.JPG)



Photo 2: Cut #1 is to the left. (Whale Necrop 2006 - 26.JPG)



Photo 3: Cut #13 is to the right. (Whale Necrop 2006 - 27.JPG)