Ship Strike Rulemaking
October 2007
NOAA Fisheries Service

Question: In reviewing the s-curve illustrating the survivability at various speeds, OVP staff wonders what evidence NOAA has of whales surviving a collision with a "large ship." OVP staff contends that we have no evidence (i.e., hard data) that lowering the speeds of "large ships" will actually make a difference.

Response: In the entire data base of known ship strikes, there are 40 records in which both vessel size and speed are known (we provide the data set below). There is only a single example of a large ship (defined as greater than 65 feet in length) hitting a whale while going more than 10 knots in which the whale suffered no or minor injuries. However, there are x records of large ships going more than 10 knots killing or seriously injuring whales There are three records of large ships traveling less than 10 knots in which the whales' injury was not serious. There are no records of lethal takes of whales from large ships traveling less than 10 knots. Therefore, we conclude that imposing a speed restriction on large ships will have a beneficial impact on right whales.

There are no experimental data (i.e., trials which vary vessel sizes and speeds to quantify injury) to establish the relationship of ship speed and size relative to injury to different species of whales.

Several types of statistical analysis (provided earlier) of the ship strike records and theoretical physics (provided earlier and appearing in the peer-reviewed literature) indicate that vessel speed is a critical variable in reducing the severity of a ship strike.

From the statistical analysis, the conclusions were:

In all statistical analyses conducted, vessel speed is a much better predictor of whale fate than vessel size. The size parameter is not statistically significant in the models which incorporate it, while speed is significant in all the models it is included in. Adding size into the speed model improves the model fit slightly, but the size parameter remains non-significant. This suggests the model is over parameterized by including size. This makes it very difficult to establish a meaningful size-speed-fate relationship at slow speeds. Otherwise, these results strongly suggest that vessel speed is significantly related to whale fate, but vessel size is not.

Accordingly, these theoretical exercises provide no basis to overturn our previous conclusion that imposing a speed limit on large vessels would be beneficial to whales.
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