

## **Routing Ships to Reduce the Risk of Ship Strikes**

*Note: This white paper was developed within NOAA Fisheries as supporting documentation to provide explanation into the development of the operational measures in the proposed ship strike strategy. The paper should be considered a working document to be used as a tool for policy analysis and to further understand the origin of proposed measures. Comments on the document are welcomed, and may be sent to [alerial.jensen@noaa.gov](mailto:alerial.jensen@noaa.gov).*

It makes intuitive sense that routing ships completely around and away from right whales will significantly reduce, and could even eliminate, the risk of ship strikes. Given the fact, however, that right whales' habitat and migratory corridor occur in or near major shipping lanes and in waters off major U.S. and Canadian ports, it is virtually impossible to route ships completely around the whales. Additionally, the location(s) of approximately one third of the right whale population has never been determined for late winter, spring and summer. Thus, until locations of the majority of the whales are determined with some certainty or predictability, it is difficult to consider routing to be a solitary solution for separating right whales and ships.

The use of changing ships' routes as a tool to reduce ship strikes may still be important in certain areas, because routing changes can be used to minimize the time a ship is in an area where right whales occur (thereby reducing time of exposure), and can facilitate ships avoiding high concentration areas, thus resulting in a risk reduction. From the perspective of the mariner, routing schemes have a high degree of predictability and are easy to understand, bearing in-mind the international and also multi-lingual aspects of shipping. In general, routing measures are established by taking into account existing traffic patterns with navigational safety considerations of paramount importance. Unfortunately, there are significant drawbacks to using routing measures alone to address ship strikes of right whales.

If routing is to be used to reduce ship strikes of right whales, the most critical element is data on where the whales are, or most likely to be (or not to be). Documented historical data on the occurrence of right whales is available for certain areas and times (e.g., right whales generally occur in the eastern side of Cape Cod Bay and are less likely to occur on the western side of the Bay). Thus routing may be useful for such an area as Cape Cod Bay and, in fact, is a recommended operational measure included in the Strategy. Real-time sighting data, to the extent it is available, may also be used to route ships around aggregations of whales, while taking into account safety of navigation (this is another recommended measure of the Strategy, dynamic management areas). Use of such real-time data is responsive to requests made by the shipping industry for such data.

In many areas, there are some data on right whale distribution; however, it is not necessarily helpful in establishing all routing measures. For example, whales may occur throughout an area; they may not follow the same patterns from year to year, and they can move substantial distances in relatively short amounts of time. In certain areas, such as in the waters of the southeast United States, the right whale calving grounds are adjacent to area ports. Thus, ships entering and leaving these ports must necessarily traverse the calving grounds. It is therefore challenging to route ships around this area without also closing these ports to all water-borne commerce. Even with data on right whale distribution, the use of routing as a measure to reduce ship strikes may be constrained, because any routing scheme must also ensure safety of navigation. Therefore, although it may be beneficial to establish a certain routing scheme that minimizes the travel distances through relatively less dense right whale habitat (as is recommended in the Strategy through a Port Access Route Study analysis), safety of navigation considerations must be accommodated. Management measures in addition to routing schemes are thus necessary to reduce ship strikes in such areas.

Finally, there are areas where there are very little or no data available on right whale distribution. In such areas, it is not possible to make predictions, *a priori*, about where whales are likely to occur; therefore, one might assume a random distribution of right whales over the entire area. Thus, it is not possible to establish a set routing system to reduce ship strikes.