Gerry E. Studds Stellwagen Bank National Marine Sanctuary
Marine Mammal Vessel Strike Action Plan

Overview

There is a paucity of data regarding vessel collisions with whales. Historical records date back to the mid 19th century, with the vast majority occurring since 1980 (Laist, et al., 2001; Jensen and Silber, 2003). Jensen and Silber have documented 292 records that currently exist world-wide. These data likely represent a gross underestimation of the problem as many strikes go unreported and most carcasses are lost at sea. In addition, the blunt trauma caused by a vessel's hull striking a whale often leaves no external signs of trauma and the cause of death can only be determined by thorough necropsy (Wiley, et al., 1995; Knowlton, et al., 2001; Jensen and Silber, 2003). Since such necropsies are rarely performed on carcasses other than North Atlantic right whales (*Eubalaena glacialis*), many vessel strike mortalities likely go unrecognized.

When whale mortality is recognized as resulting fom vessel strike, identifying the specific vessel or vessel type is difficult. In many cases, the crew of a very large vessel might be unaware that a strike has occurred and therefore do not report the occurrence. Vessels of all sizes and types might also fail to report because of fear of prosecution (in those countries where laws or regulations prohibit such strikes) or a lack of knowledge concerning the need to report or reporting procedures. As a result, the vast majority of strikes go undetected and/or unreported. Where the vessel type is known, the majority of reports of whale collisions are from the U.S. Navy/U.S. Coast Guard (USCG) (14.9% of the 292 strikes) and commercial whale watch boats (14.2%) (Jensen and Silber, 2003). However, these data are likely to be strongly effected by disproportionate reporting, as it is standard operating practice for the U.S. Navy/USCG to report a strike and commercial whale watch vessel operators or passengers are more likely to be aware of, and report, a collision than other sources.

Vessel strikes along the east coast of the United States have received a great deal of attention in recent years because of their role in inhibiting the recovery of North Atlantic right whales. Vessel strikes are the leading cause of human-induced mortality in this species followed by entanglement in fixed fishing gear (Knowlton, et al., 2001). Twenty-five cases of right whale ship strikes were reported, of which 18 (72%) were fatal. Given the precarious position and current decline of the right whale population (Caswell, et al., 1999), and the contention that saving two right whale females per year would halt the decline (Fujiwara, et al., 2001), the issue is serious.

While less is known about vessel strikes of humpback (*Megaptera novaeangliae*) and fin (*Balaenoptera physalus*) whales, fatal strikes are known to take place in these species as well. In the mid-Atlantic region, a significant number of strandings of humpback whales in the early 1990's were found to be due to ship strikes (Wiley, et al., 1995). Three fatal fin whale ship strikes took place off of New York harbor in the three months between December 2000 and February 2001 (Jensen and Silber, 2003). Among all ship strike records, fin whale strikes were the most numerous, with humpback strikes second (Jensen and Silber, 2003). Along the U.S. east coast, of the 100 strikes attributable to species, 34 were of fin whales, 25 were of right whales, 23 were of humpback whales, and 13 were of minke whales (*Balaenoptera*

acutorostrata) (in addition, two strikes each of sei (*Balaenoptera borealis*) and sperm whales (*Physeter catadon*) and one strike of a blue whale (*Balaenoptera musculus*) are known; Jensen and Silber, 2003). Since humpback, fin, right, and minke whales occur commonly in the Stellwagen Bank National Marine Sanctuary (SBNMS) (Seipt, et al., 1989; Clapham et al., 1993; Ward, 1995), and there is a significant amount of vessel traffic, there is reason for concern when they are in the area.

The SBNMS Area

Vessel strikes are known to take place in the SBNMS. In a review of the 292 strikes reported in Jensen and Silber (2003) since 1984[1] and supplemented from other sources (Exhibit MMVS.I), 16 were identified as having taken place within the SBNMS and 10 had general locations attributed that likely included the SBNMS or adjacent waters (e.g., off Provincetown, Massachusetts Bay, Cape Cod Bay) (n = 26). An additional 7 carcasses were found beach cast around the sanctuary or in Boston Harbor (total n = 33). The later were included because the greatest co-occurrence between whales and vessels occurs in the SBNMS and it is possible that these animals were struck in or around the sanctuary and drifted to other locations. Given the reporting problems identified above, these figures are likely conservative.

Data from Jensen and Silber (2003) indicated approximately 10% (31/292) of the world-wide data regarding collisions were reported from the SBNMS area (including Cape Cod Bay and Boston Harbor)[2] and that the SBNMS area is a "hot spot" for vessel strikes along the eastern seaboard of the United States (Exhibit MMVS.II). Strikes were reported throughout the year with 76% occurring between May and August, a time when whales and opportunistic observations increase, and 39% (13/33) of the reported strikes resulted in a mortality or serious injury (Exhibit MMVS.I). Species involved included four endangered species (humpback, finback, sei, and right) and one protected species (minke) (Exhibit MMVS.III) with most strikes involving humpback whales (42%, 13/33), followed by fin whales (27%, 9/33). Commercial whale watch vessels were involved in 27% (9/33) of the strikes, 12% (4/33) involved private recreational-type boats and 9% (3/33) were identified as struck by large commercial ships (e.g., container ship or ferry). However, as mentioned previously, these data are likely to be heavily biased as 45% of the strikes lacked information regarding the vessel involved, and commercial whale watch vessels are substantially more likely to report a strike than other vessel types. Overall, the reported strike rate for the area was approximately 1.65 baleen whales per year for the period 1984-2003.

Additional concern about vessel strikes of marine mammals in the SBNMS comes from several well-publicized strikes by commercial whale watch boats in 1998 (Exhibit MMVS.I). Within several months of each other a humpback (seriously injured), a fin whale (fate unknown), and a minke whale (killed) were all struck in or around the sanctuary. These strikes coincided with a time when the average speed of whale watch boats increased from 13.6 knots (in 1997) to 18.9

[1] Baleen whales were struck by vessels in and around the SBNMS prior to this date and several people interviewed had witnessed such events. However, record keeping was poor and people interviewed regarding strike information often could not recall specific dates or even years. Therefore, we chose to use 1984 -2003 as the data period included in this report because data for those years seemed to be most accurate. We also did not include a number of animals witnesses observed within or near the SBNMS with fresh wounds, but for which the site of strike could not be determined. Thus, data provided are conservative.

[2] These numbers do not include information from supplemental sources.

knots (in 1998) and the industry's maximum speed increased from 23 kts (in 1997) to 35 kts (in 1998) (Exhibit MMVS.III). These strikes led the Northeast Large Whale Recovery Plan Implementation Team Ship Strike Sub-committee to form an ad hoc task force to suggest management measures to minimize the risk of further strikes. Recognizing that whale watch boat speed was increasing over time, the team ended up suggesting a series of slow-down zones as a whale was approached. Boats were advised to travel at speeds no greater than 13 knots within two miles of a whale, no greater than 10 knots at a mile, and at idle speed (no greater than 7 knots) within a half-mile. This was done to protect both the focal whale and any "unseen" whales that might be near the animal(s) that had been sighted. It was also suggested that a dedicated look-out be stationed when within two miles of a whale, to increase the chance that other nearby whales would be detected and safely avoided. These suggestions have since been incorporated into the official National Oceanic and Atmospheric Administration (NOAA) Fisheries Northeast Whale Watch Guidelines in an attempt to decrease the risk of these vessels striking whales.

Factors Contributing to Vessel Strikes

The paucity of data pertaining to vessel strikes to whales results in a lack of knowledge concerning what factors are likely to cause or contribute to the problem. Possible factors include, but are not limited to, 1) the density of whales and vessels, 2) the ability of whales and vessel operators to detect each other and 3) the ability of whales or vessel operators to maneuver to avoid collisions. For collisions between terrestrial wildlife and vehicles, the volume of traffic or animals, and the speed of the traffic are considered key contributors (S. Jackson, University of Massachusetts, Amherst Massachusetts, Department of Forestry and Wildlife Management, presentation to Marine Mammal Vessel Strike [MMVS] Working Group [WG] on 9 February 2004). While, it is not clear that direct parallels can be drawn between terrestrial and marine environments and/or species, such information might be useful when considering this issue.

1. *Density of Baleen Whales and Vessel Traffic in and Around the SBNMS*

The number of baleen whales occurring within and around the SBNMS varies by species, season and year. Right whales can occur in all months, but are usually most abundant from December – May. Humpback, fin and minke whales can also occur year round, with peak abundance typically between April and November (Seipt, et al., 1989; Clapham, et al., 1993; Ward, 1995). Local abundance shows substantial inter-annual variability, with annual baleen whale sightings ranging from a few hundred to tens of thousands[3].

Vessel traffic in the SBNMS occurs year round. For large commercial ships, the Boston Harbor Pilots association reported approximately 2000 transits (inbound and outbound) annually for the years 2000-2003 (2188, 2028 and 2230, respectively). In 2003, this number included 56 container, 161 tankers, 54 liquefied natural gas (LNG), 22 salt, 5 scrap, and 95 cruise ships (B. Welloch, Report to MMVS WG, 2004). Additional passages are made by tugs and barges and other commercial shipping that did not require pilot assistance or that transited the sanctuary without calling on the port of Boston. For the years 2000-2003, commercial shipping volume was relatively stable on a monthly basis (Boston Pilots Association, unpublished data). Many of these vessels transit the sanctuary within the area of

[3] A single animal can be sighted multiple times during a year.

a Traffic Separation Scheme (TSS) that crosses the sanctuary. However, the TSS is not mandatory and ship traffic occurs throughout the sanctuary.

A wide assortment of other crafts make use of sanctuary waters. The SBNMS is considered a prime area for whale watchers, with at least 13 commercial companies focusing activity on the sanctuary (Hoagland and Meeks 1997). Most companies conduct multiple daily trips using one or more vessels during the April – October time period. Three ferries also operate seasonally in the sanctuary. Smaller vessels also make heavy use of sanctuary waters. In 2003, Massachusetts distributed licenses to 472 charter, 37 party, and 13 regular guide boats, many of which accessed sanctuary waters. Numerous commercial fishing vessels operate within the sanctuary including those targeting groundfish, lobster, Jonah crab, hagfish, scallop, and tuna. In addition, because of the sanctuary's proximity to major commercial and recreational fishing ports, many more vessels transit its waters as they travel to and from fishing grounds outside the sanctuary's boarders. An unknown number of recreational and military vessels also visit the sanctuary.

2. *The ability of Whales and Vessel Operators to Detect Each Other*

To avoid collisions, whales and vessel operators must be aware of each other's presence. Information provided by Peter Tyack of the Woods Hole Oceanographic Institution indicated that whales should be able to detect the presence of vessels because vessels emit substantial sound in frequencies whales can hear. However, whales might fail to quickly react to such sounds because they are constantly subjected to them (habituation) or because sounds from multiple vessels might result in whales having difficulty determining the direction to the source. Detection of whales by operators also involves difficulties. First, whales can only be visually detected when they are at the surface. Since whales spend the majority of the time at depths of more than a few meters, they are often invisible to even the most prudent operator. Depending on vessel draft, subsurface whales might be outside of the effective strike zone or within the area of vulnerability. Visual detection is also limited by local conditions such as sea state, weather (e.g., fog) and/or light. Despite these limitations, the working group agreed that increased vigilance by operators and crew would likely result in decreased collision potential, as long as such vigilance directly translated into evasive actions on the part of vessels. While whale detection technologies are theoretically feasible, they do not presently exist in a state adequate to contribute to resolution of the problem.

3. *The Ability of Whales or Vessel Operators to Avoid Collisions*

The ability of whales or operators to avoid a collision depends on their taking sufficient evasive action following detection. The key factors in collision avoidance involve speed/reaction time and maneuverability. Swimming speeds of baleen whales vary by species and activity. Under normal behaviors, most travel at speeds of ~ 1-5 knots, with maximum, short-term speeds ranging from 4 – 21 kts (Perrin, et al., 2002).

Vessel speeds also range considerably depending on vessel type and activity. Industry representatives indicted that top speed for container and cruise ships is ~ 25 kts. Tankers and bulk carriers typically travel at speeds < 15 kts, and tug/barge combinations usually travel at speeds < 10 kts. Speed trends for these vessels are not known. However, between 1997 and 2001 there was a 74 % increase in foreign flagged vessels with a draft >30 ft calling on the

port of Boston, suggesting that larger and possibly faster vessels might be using the area. Some recreational boats are reaching speeds in excess of 45 kts. The mean speed of whale watch boats has been increasing in the past twenty-five years. In 1980, the mean speed of the whale watch fleet was ~11 kts with the fastest vessel approaching 15 kts. In 2003, the mean speed of the fleet was 23 kts, with the fastest vessels exceeding 35 kts (Wiley and Moller, unpublished data).

The relationship between vessel speed and the frequency of collisions with whales has been debated, with the main variables being the escape capabilities of the whale and the avoidance capabilities of the vessels. If whales and vessels make no attempt to avoid collision, modeling suggests that frequency of collision is independent of speed (Kite-Powell, personal communication, 2004). Several WG members indicated that in at least some cases whales do attempt to avoid ships by moving away from them, but noted that whales have also surfaced underneath small, slow moving or stationary vessels. If whales or vessels take avoidance measures, such actions are facilitated by the increased reaction time provided by slower vessel speeds. Data and film from dugongs in Australia provided by Amanda Hodgson of James Cook University showed that the speed of an approaching boat influenced a dugong's ability to successfully move out of the ship's path. However, this relationship might be confounded by the ability of some vessels to maneuver more effectively at higher speeds. Within the SBNMS, the strike rate for commercial whale watching boats nearly tripled from 0.29 whales per year when the average vessel speed was <~14 kts (1984-1997) (4 strikes in 14 years) to 0.83 animals per year when average vessel speed neared or exceeded 20 kts (1998-2003) (5 strikes in 6 years) (Exhibit MMVS.IV).

Factors Contributing to Whale Mortality

Laist et al (2001) suggested that a ship traveling at greater than 13 kts striking a whale is likely to result in a fatality. Taggart and Vanderlaan (2003) calculated that vessel speeds of <5 kts would be unlikely to cause mortality, speeds of ~18 kts would result in mortality ~50% of the time and speeds in excess of 23 kts would result in 100% mortality. However, any vessel is capable of causing a fatal strike as the intensity of the collision depends on the size (tonnage) of the vessel, and the speed at which it is traveling. Therefore, a small vessel traveling at high speed can apply the same force as a large vessel moving slowly.

Evaluation of Existing Regulations

Marine Mammal Protection Act

NOAA Fisheries Whale Watch Guidelines—Northeast Region (See Appendix MMVS.I; note: these are voluntary guidelines, not regulations)

Endangered Species Act

- *Vessel Approach Regulations:*
  In February 1997, the NOAA Fisheries Service implemented a regulation to minimize boat disturbance of right whales by restricting vessel approaches. These regulations prohibit all approaches within 500 yards (460m) of any right whale, whether by ship,

aircraft engaged in whale watching, or other means. Exceptions exist for emergency situations and where certain authorizations are provided.

- *Mandatory Ship Reporting*
  Each ship of 300 gross tons or greater must participate in the reporting systems, except sovereign immune vessels. However, exempt ships are encouraged to participate in the reporting systems. Participating ships must report to the shore-based authority upon entering the area covered by a reporting system. Additional reports are not necessary for movements made within a system or for ships exiting a system. A ship equipped with Inmarsat–C must report in International Maritime Organization (IMO) standard format as provided in Table 169.140 in §169.140. A ship not equipped with Inmarsat–C must report to the USCG using other means, listed below in order of precedence: (1) Narrow band direct printing (SITOR). (2) high frequency (HF) voice communication, or (3) medium frequency (MF) or very high frequency (VHF) voice communications. SITOR or HF reports made directly to the USCG Communications Area Master Station Atlantic (CAMSLANT) in Chesapeake, VA, or MF or VHF reports made to USCG activities or groups, should only be made by ships not equipped with Inmarsat–C. Ships in this category must provide all the required information to the USCG watchstander. Each ship report made to the shore-based authority must follow the standard reporting and format requirements listed in table 169.140.

Telegraphy	Function	Information required
Name of system	System identifier	Ship reporting system WHALES NORTH or WHALES SOUTH
A	Ship	The name, call sign or ship station identity, IMO number, and flag of the vessel.
B	Date and time of event	A 6-digit group giving day of month (first two digits), hours and minutes (last four digits).
E	True course	A 3-digit group.
F	Speed in knots and tenths of knots	A 3-digit group.
H	Date, time and point of entry into system	Entry time expressed as in (B) and entry position expressed as: (1) a 4-digit group giving latitude in degrees and minutes suffixed with N (north) or S (south) and a 5-digit group giving longitude in degrees and minutes suffixed with E (east) or W (west); or (2) True bearing (first 3 digits) and distance (state distance) in nautical miles from a clearly identified landmark (state landmark).

- NOAA Fisheries Proposed Strategy to Reduce Ship Strike to North Atlantic Right Whales (See Federal Register 69(105):30857-864 or http://www.nmfs.noaa.gov/pr/PR2/Conservation_and_Recovery_Program/msr/ship_strike.htm)

NOAA's Authority to Regulate Shipping Activity within the SBNMS

NOAA and the members of the commercial shipping industry disagreed over the sanctuary's authority to regulate commercial shipping activities. NOAA asserted that the National Marine Sanctuaries Act (NMSA) provided broad powers to manage commercial shipping, while industry believed that their activities were outside of the sanctuaries purview. The positions of NOAA and the industry can be found in Appendix MMVS.II. Additional rationale for NOAA's authority to regulate shipping to protect marine mammals and endangered whales is contained in the Marine Mammal Protection Act and the Endangered Species Act as provided in the NOAA Fisheries Proposed Strategy to Reduce Ship Strike to North Atlantic Right Whales. (See Federal Register 69(105):30857-864 or http://www.nmfs.noaa.gov/pr/PR2/Conservation_and_Recovery_Program/msr/ship_strike.htm)

Goal Statement

Our goal is to determine where and when the potential of collision to marine mammals exists within the sanctuary, to determine what mitigation measures might be necessary and appropriate to minimize that potential, and, if necessary, determine what steps might be taken to assess the potential of collision where insufficient information currently exists. Additional goals are to foster cooperation with cross-jurisdictional partners addressing the issues, and educate sanctuary users regarding the issues.

Addressing the Issues – Strategies for this Action Plan

The sanctuary will work in partnership with various agencies, industries and organizations to address the issue of vessel strikes to marine mammals. To that end, the WG is providing the following strategies, activities and actions. Activities represent agreed upon actions that are recommended by the entire WG. Options are provided when the WG did not agree upon an activity. Options are backed by a subset of the WG.

This Action Plan has been divided into the following three parts:

Part A – Management of Commercial Ships

- Strategy MMVS.A.1 – The Sanctuary Should Reduce the Risk of Vessel Strike Between Large Commercial Ships and Right Whales
- Strategy MMVS.A.2 – The Sanctuary Should Reduce the Risk of Vessel Strike Between Large Commercial Ships and Baleen Whales (Additional to or Including Right Whales)
- Strategy MMVS.A.3 – The Sanctuary Should Institute Voluntary Speed Restrictions for Large Commercial Ships to Mitigate Vessel Strikes to Marine Mammals

Part B – Management of Other Vessels Not Actively Engaged in Approaching Whales for Viewing

- Strategy MMVS.B.1 – The Sanctuary Should Institute Voluntary Speed Restrictions for Vessels Other Than Large Commercial Ships to Mitigate Vessel Strikes to Marine Mammals

Part C – Management of Vessels Actively Engaged in Approaching Whales for Viewing

- Strategy MMVS.C.1 – The Sanctuary Should Seek Ways to Increase Compliance with the Current Whale Watching Guidelines Established for the Northeast Region of the United States
- Strategy MMVS.C.2 – Enforcement
- Strategy MMVS.C.3 – Outreach and Education
- Strategy MMVS.C.4 – Research
- Strategy MMVS.C.5 – Emerging Issues

Marine Mammal Vessel Strike Action Plan Part A – Management of Commercial Ships

Overview

It was agreed that large commercial ships (defined as those vessels with a weight of greater than 300 gross tons, or tugs and barges with a combined weight of more than 300 gross tons) represented a distinct class of vessels. A key reason for the separation of large commercial vessels from other vessel types were issues relating to their maneuverability and inability to take sudden actions to avoid collisions with whales.

STRATEGY MMVS.A.1 – THE SANCTUARY SHOULD REDUCE THE RISK OF VESSEL STRIKE BETWEEN LARGE COMMERCIAL SHIPS AND RIGHT WHALES

Activities (1)

(A.1.1) *The SBNMS should be aware of the NOAA Fisheries' proposed strategy to reduce ship strike to North Atlantic right whales and how such measures would affect the sanctuary.*
There was agreement among the working group members that right whales were extremely endangered, and that special consideration should be awarded to them. The NOAA Fisheries is currently developing a Proposed Rule, "Proposed Strategy to Reduce Ship Strike to North Atlantic Right Whales", to reduce collision risk between right whales and commercial ships while minimizing adverse impacts on the shipping industry. A draft of an Advanced Notice of Proposed Rulemaking was presented to the WG. Possible plans involving the sanctuary include a nearby area to be avoided on the eastern side of Cape Cod Bay during the winter and early spring, and speed limitations for all vessels 65 feet and over in an area north of Race Point (including a portion of the sanctuary) from 1 April to 15 May. At this time (the drafting of the WG's Action Plan) the NOAA Fisheries' plan has not been finalized or appeared in the Federal Register[4]. The WG was not given the opportunity to review the final NOAA Fisheries planned Proposed Strategy to Reduce Ship Strike to North Atlantic Right Whales and provided the following options to the Sanctuary Advisory Council (SAC) for consideration:

Actions:

A.1.1.1.a The SBNMS should work with NOAA Fisheries and support their efforts to implement the portions of the Proposed Strategy to Reduce Ship Strike to North Atlantic Right Whales that overlap the SBNMS.

Rationale: NOAA Fisheries presented to the WG an overview of a national plan that will soon be published as an Advanced Notice of Proposed Rulemaking (ANPR) to reduce vessel strikes on right whales along the east coast. One of the proposed areas, off of Race's Point, occurs largely within the Stellwagen Bank Sanctuary. The measures were developed to increase protection of right whales, while

[4] Since the last meeting of the WG, NOAA Fisheries has released an Advanced Notice of Proposed Rule Making in the Federal Register (FR 69(105):30857-864). A Proposed Rule will appear at some time in the future.

minimizing impacts on vessel operators. This goal is consistent with the goals of the SBNMS. The season and area proposed reportedly encompass observed routes that right whales take when leaving Cape Cod Bay. The minimum vessel size was selected because the smallest vessel identified in a lethal strike of a whale was 82 ft and 65 feet was the closest, yet smaller, size used as a standard size for other maritime industry and regulatory purposes. The actual ANPR is not yet available for a complete review by the working group; therefore some group members were concerned with the adequacy of the precise area designated, the likely speed restrictions to be proposed, or the size of vessels designated for speed restrictions. However, the proposed plan was developed after more than a year of deliberations by a team put together by NOAA Fisheries regulatory agency personnel. Lacking the resources to deliberate as fully as the authors of the NOAA Fisheries ship strike plan, the SBNMS should work cooperatively with NOAA Fisheries to implement the portions of the national ship strike plan for the waters off of Race's Point.

A.1.1.1.b The SBNMS should review the adequacy of risk reduction measures contained in the NOAA Fisheries vessel strike risk reduction plan for North Atlantic right whales, which is soon to be released. If the review indicates that the plan is not adequate to reduce risk to right whales in the SBNMS, then staff should make recommendations to strengthen risk reduction measures.

Rationale: The NOAA Fisheries provided a pre-release presentation of proposed measures in the plan to this working group. The sole measure that would affect SBNMS was a recommendation that speed restrictions be implemented for a small area at the southern boundary of SBNMS called "off Race Point," from April 1 to May 15 annually. The intent was to protect right whales leaving their Cape Cod Bay critical habitat and moving east through the sanctuary into the Gulf of Maine and the Great South Channel. The limited time period would not be in effect during the late winter and early spring (December to April) when right whales are entering Cape Cod Bay through SBNMS, which is the primary means of ingress. The group discussed this point as well as the suggestion that an additional, alternative shipping lane into Boston might be useful to shift traffic away from seasonal aggregations. When the NOAA Fisheries plan is released for comment, it is important that the SBNMS assure that the plan is sufficient to reduce collision risk to right whales using the sanctuary's waters; and suggest alternative measures if the proposed strategies are insufficiently precautionary.

A.1.1.1.c The SBNMS should take no position on the NOAA Fisheries Plan until the final plan has been published.

Rational: As there is no final document published from the NOAA Fisheries with regards to right whales in the vicinity of the SBNMS, the WG can not review it. Therefore, a neutral position, none in favor or against, should be adopted until the final plan has been released for review.

STRATEGY MMVS.A.2 – THE SANCTUARY SHOULD REDUCE THE RISK OF VESSEL STRIKE BETWEEN LARGE COMMERCIAL SHIPS AND BALEEN WHALES (ADDITIONAL TO OR INCLUDING RIGHT WHALES)

Activities (2)

(A.2.1) *Development and evaluation of the SBNMS Information and Reporting Center.*
The SBNMS should create a pilot project to assess the feasibility of developing the SBNMS Marine Mammal Information and Reporting Center (MMIRC) (for one proposed scenario see Appendix MMVS.III), based on use of the Automatic Identification System (AIS). The project would 1) investigate the ability of the MMIRC to identify and provide information to ships entering the SBNMS, 2) identify the actions of the vessels based on the information provided, 3) assess the adequacy of whale sighting and reporting information, and 4) evaluate the efficacy of the MMIRPC for reducing the risk of vessel/whale collisions. If the pilot program determines the MMIRC to be an effective way of reducing risk of collision, the sanctuary should consider expanding the program as an ongoing management tool.

Rationale: The AIS provides an automatic, real-time mapping of many commercial vessels (>65 ft in length) including their location, identities, contact information, speed, and other attributes. These data could be useful in reducing the risk of collisions between whales and vessels by providing a means to contact ships with the location of whales in their path. Such data would be particularly helpful if sightings data could approach "real-time" accuracy. However, the AIS system capabilities are unknown. In addition, it is not clear that providing information to vessel operators is, in itself, a conservation measure. Therefore, it is not an action to reduce the risk of whale/vessel collisions, but a research action that will result in a recommendation as to its potential conservation benefits.

(A.2.2) *The sanctuary should work with the IMO, the USCG and NOAA Fisheries to reconfigure the current TSS to reduce the potential for whale strikes by commercial vessels transiting the SBNMS.*

Rationale: Data collected from commercial whale watch vessels over the past 25 years indicate that some portions of the sanctuary were regularly used by larger numbers of whales than others. While this pattern was influenced to an unknown degree by reporting biases, it can provide the basis for informed decisions. D. Wiley (SBNMS) and M. Thompson (Perot Systems Government Service) provided data indicating that a small shift in the current TSS could reduce the interaction with historic whale sightings by nearly 70% (see Appendix MMVS.IV). They also showed that the ecological basis for

this reduction was likely due to moving the TSS away from sand substrate preferred by sandlance fish, a primary forage species for humpback, fin and minke whales. Sand sediments occurred over 48% of the current TSS area and only 18% of the reconfigured TSS. However, there is need for the sanctuary to gather more information on right whales sightings from the area prior to making final decisions. It should be noted that even minor changes to the TSS require major effort prior to approaching the IMO, including a port access route study. Finally, the sanctuary should work closely with NOAA Fisheries to assure efforts are coordinated and compatible.

STRATEGY MMVS.A.3 – THE SANCTUARY SHOULD INSTITUTE VOLUNTARY SPEED RESTRICTIONS FOR LARGE COMMERCIAL SHIPS TO MITIGATE VESSEL STRIKES TO MARINE MAMMALS

Strategy Summary

Some members of the WG did not believe that mandated lower speeds within the sanctuary were needed. Some also questioned the legal authority of the SBNMS to impose speed restrictions on vessels, a position rejected by the sanctuary (see Appendix MMVS.II for NOAA and industry opinions on the sanctuary's ability to regulate vessel speed). Finally, some members believed speed restrictions might be economically damaging to their industry (see Appendix MMVS.V).

Other members of the group expressed concern that voluntary measures were not enforceable and it was impossible to quantify risk reductions based on such measures. In addition, if such measures were not followed there would be no way to compel compliance through legal recourse. They further pointed out that the Endangered Species Act is relatively blind to economic impacts (see Appendix MMVS.V). After much discussion, the group reached consensus that the following voluntary measures (guidelines) should be developed. The sanctuary should review these guidelines at the end of 5 years or sooner if new information becomes available to evaluate their effectiveness. It should be noted that these voluntary measures are recommended for times and areas not covered by current or future regulatory actions (e.g., NOAA Fisheries measures to reduce interactions between right whales and shipping), which would supersede voluntary measures.

Activities (2)

(A.3.1) *Voluntary speed restriction for commercial vessels during daylight and good visibility.* Within 2 miles of the known location of a sighting or an aggregation of whales (either through a direct observation or a report from the MMIRC described elsewhere), vessels > 100 GT will route around the buffer zone or reduce speed to 18kts or less while transiting within the buffer. Vessels <100 GT, within 2 miles of a sighting or reported aggregation will reroute around the buffer zone or reduce speed to <21 kts or less.

(A.3.2) *Voluntary speed restriction for commercial vessels at night, or in reduced visibility.* Within 4 miles of a known sighting or an aggregation, vessels > 100 GT will route around the buffer or reduce speed to 18kts or less while transiting within the buffer. Vessels <100 GT,

within 4 miles of a known sighting or an aggregation will reroute around the buffer or reduce speed to <21 kts.

Rationale: While it is not known when strikes occur, the ability to detect and avoid a whale decreases when visibility and awareness are reduced. As large ships are likely to transit the sanctuary at all hours, and in all weather conditions, this precautionary measure may reduce the severity of collisions with whales. It is important to note that this effort will largely depend upon reporting from commercial whale watch and other vessels, as it is unlikely that any vessel operator will visually detect a whale from more than two miles away or at any distance at night or in dense fog. While consensus on this Activity is recorded in the meeting minutes, a subset of the group did not believe that consensus had been reached and did not accept the minutes as written. This subset did not believe that expanding the area (from 2 – 4 nm) around animals that can not be seen because of visibility issues would be an effective conservation measure without including additional speed reductions.

Marine Mammal Vessel Strike Action Plan Part B – Management of Other Vessels

Overview

Strategies and Activities outlined under Part B of this Action Plan focus on vessels that are not actively engaged in approaching whales for viewing (i.e., not large commercial vessels as described above)

STRATEGY MMVS.B.1 – THE SANCTUARY SHOULD INSTITUTE VOLUNTARY SPEED RESTRICTIONS FOR VESSELS OTHER THAN LARGE COMMERCIAL SHIPS TO MITIGATE VESSEL STRIKES TO MARINE MAMMALS.

Strategy Summary

The category of vessels highlighted under this Strategy include sport, recreational and commercial fishing vessels not approaching whales for viewing (i.e., the category excludes commercial and recreational whale watching vessels).

Activities (2)

(B.1.1) *Voluntary speed restriction for non-commercial shipping vessels during daylight and good visibility.*
Within 2 miles of a sighting or an aggregation, vessels > 100 GT will route around the buffer or reduce speed to 18kts or less while transiting within the buffer. Vessels <100 GT, within 2 miles of a sighting or an aggregation will reroute around the buffer or reduce speed to <21 kts or less.

(B.1.2) *Voluntary speed restriction for non-commercial shipping vessels at night, or in reduced visibility.*
Within 4 miles of a known sighting or an aggregation, vessels > 100 GT will route around the buffer or reduce speed to 18kts while transiting within the buffer. Vessels <100 GT, within 4 miles of a sighting or an aggregation will reroute around the buffer or reduce speed to <21 kts.

> *Rationale:* While it is not known when strikes occur, the ability to detect and avoid a whale decreases when visibility and awareness are reduced. As ships and boaters are likely to transit the sanctuary at all hours, and in all weather conditions, this precautionary measure may reduce the severity of collisions with whales. It is important to note that this effort will largely depend upon reporting from commercial whale watch and other vessels, as it is unlikely that any vessel operator will visually detect a whale from more than two miles away or at any distance at night or in dense fog.

Marine Mammal Vessel Strike Action Plan Part C – Management of Vessels Actively Engaged in Approaching Whales for Viewing

Strategies and Activities outlined under Part C of this Action Plan focus on vessels that are actively engaged in approaching whales for viewing (i.e., commercial and recreational whale watching vessels).

Overview

The WG did not agree on actions pertaining to vessels that actively approached whales for viewing (whale watching). Some members of the group felt that this vessel category had a special responsibility to whales because it actively targeted them and in the case of commercial whale watching companies, derived substantial commercial gain from the activity. They pointed out that, by design, whale watching vessels spent considerable amounts of time in high whale density areas and that the vessels had a documented history of whale strikes that included serious injury and mortality to animals. Such strikes had occurred within the SBNMS and throughout the world (Exhibit MMVS.V).

Other members of the group disputed the special nature of the activity or that whale watching placed whales at higher risk. They pointed out that whale watching companies employed trained naturalists to spot whales and were extremely knowledgable about whale behavior. While acknowledging that some whale watching vessels had struck whales, they maintained that the tendency for commercial whale watching vessels to report strikes elevated their strike rate as compared to other vessel categories that did not report strikes. As evidence, they pointed out that most of the whale strikes came from unknown vessels. This asymmetry in reporting created the illusion that whale watching was a higher risk activity. Members of the group also pointed out that most of the vessel strikes by whale watching boats had come when vessels were traveling to and from the whale watching areas, a time when their behavior would be no different than any other vessel transiting the sanctuary. Therefore, singling out whale watch vessels for special actions was inappropriate. They maintained that voluntary guidelines already existed to recommend prudent operations in the vicinity of whales and that those guidelines were sufficient to protect whales from strikes.

Whale Watching Guidelines

Whale watching guidelines already exist for the Northeast Region of the United States (Appendix MMVS.I). These guidelines were developed in 1998 by a working group of industry representatives, conservation groups, NOAA Fisheries and the SBNMS. The SBNMS MMVS WG agreed that these guidelines, if followed, should be sufficient to protect whales from strikes by whale watching vessels (for information of whale harassment see the Marine Mammal Behavioral Disturbance Action Plan). The group also felt that, if followed, the guidelines provided whales with greater protection than regulations that exist in Hawaii and Alaska. However, a study conducted by the SBNMS in the summer of 2003 (Wiley and Moller unpublished data) indicated that the commercial whale watching industry's level of guideline compliance was very low (Appendix MMVS.VI).

STRATEGY MMVS.C.1 – THE SBNMS SHOULD SEEK WAYS TO INCREASE COMPLIANCE WITH THE CURRENT WHALE WATCHING GUIDELINES ESTABLISHED FOR THE NORTHEAST REGION OF THE UNITED STATES

Strategy Summary

While the WG agreed that the sanctuary should work to increase the level of guideline compliance, they could not agree on action(s) to create such compliance. Therefore, the MMVS WG is submitting a series of options to the SAC. These options are 1) codify the existing whale watch guidelines, 2) model new regulations after those in existence in Hawaii and Alaska, 3) create a sanctuary-issued Special Use Permit for whale watching within the SBNMS, 4) create a certification program for whale watching within the SBNMS, 5) maintain the current guidelines with increased compliance monitoring, and 6) creating a sanctuary whale watch association.

Options (6)

(C.1.1) *The sanctuary should codify the existing Whale Watch Guidelines as regulations.*

> *Recommendation:* The sanctuary should work with NOAA Fisheries to codify the existing Whale Watch Guidelines as regulations
>
> *Rationale:* The current Whale Watching Guidelines, if complied with, provide protection for whales from vessel strikes by vessels engaged in whale watching. However, compliance has been demonstrated to be extremely low (Wiley and Moller, unpublished data). Codification of the existing guidelines would increase compliance because they would become concrete standards which could be enforced by regulatory personnel. An additional advantage is that they are already known to and understood by the industry.

(C.1.2) *The sanctuary should promulgate approach regulations patterned on those in Hawaii and Alaska (i.e., 100 yard approach limit).*

> *Recommendation:* The sanctuary should work with NOAA Fisheries to promulgate approach regulations patterned on those in Hawaii and Alaska (i.e., 100 yard approach limit)
>
> *Rationale:* The current Whale Watch Guidelines for the Northeast U.S. are more restrictive than the existing federal regulations in Hawaii and Alaska. If regulations are desired, they should be consistent with those in other areas.

(C.1.3) *The sanctuary should create a Special Use Permit for whale watching within the SBNMS.*

> *Recommendation:* The sanctuary should work with NOAA Fisheries to adopt a regulation requiring vessels to stay 100 yards (300 feet) from whales within the sanctuary unless the operator possesses a special use permit. Special use permits would be available to any operator who has paid the required fee and attended training in responsible boating

around whales. Those who possess special use permits would be allowed to approach to 100 feet, provided they follow strict speed limits and other conditions of the permit, which could be revoked for failure to comply with conditions of its use.

Rationale: Data presented to the vessel strike working group and to the behavioral disturbance group substantiate that whale watch vessels have struck whales. Whales have sometimes been hit just as the whale watch vessels were leaving an area where they had been watching whales. Because the vessels clearly knew that whales were nearby, we know that this problem cannot be adequately addressed simply by relying on vessels communicating the general location of whales to one another or to a shore-based informational relay. Risk of collisions can be reduced by requiring vessels to maintain a reasonable distance from whales and proceeding slowly in their proximity. Other recommendations in this report are addressing the issue of speed. This recommendation addresses the issue of proximity to whales.

The Hawaiian Islands Sanctuary and Glacier Bay National Park both require vessels to stay 100 yards (300 feet) from endangered whales. Members of the group recommend that this same approach distance be imposed in the SBNMS. The Hawaiian Islands are a sensitive birthing and breeding area for humpback whales, and Glacier Bay is an enclosed space, so they present particular challenges that necessitate strict adherence to conservative approach distances. Because the area of Stellwagen Bank is open ocean and is not a breeding area, we believe that it may be possible to allow vessels to approach whales closer than 100 yards, provided the master of the vessel has undergone basic training in whale behavior and safe vessel operation. If he or she has done so, they could be granted a Special Use Permit and be allowed to approach whales up to 100 feet, which is the current NOAA Fisheries guideline for closest approach. All other vessels, with untrained crew (and lacking a Special Use Permit), would be required to adhere to the 100 yard approach distance. Any person, whether they are employed by a whale watch company or are simply a private vessel operator, could participate in the training and receive a Special Use Permit.

Under this proposal, a permit could be revoked if the vessel operator was found to violate the conditions of the permit (including stipulations on distance and speed of approaches), thus assuring that responsible behavior is rewarded and negligent behavior is not condoned.

The NMSA allows for Special Use Permits to be granted (see Section 310) if the Secretary determines that such authorization is necessary to establish conditions of use of any sanctuary resource or to promote public use and understanding of a sanctuary resource. Members of the group believe that whales are best safe guarded by requiring inexperienced or ill-informed vessel operators to stay 100 yards away from whales, and that getting closer to whales (a sanctuary resource) should require a permit. We believe that this section authorizes the Secretary to allow closer access as a means of controlling risk to whales and educating the public of the importance of careful operation. Fees can be charged as a part of this program and could be used to assist in monitoring and

enforcement. Section 922.48 of the Code of Federal Regulations (Title 15, Chapter IX) provides a full description of how permits can be issued.

(C.1.4) *The sanctuary should create a certification program for whale watch vessels/operators.*

Recommendation: The SBNMS should create a certification program for whale watch companies/operators. This program would ensure that companies and their operators were familiar with the whale watch guidelines and the need to comply with them. Certified companies could be listed on the sanctuary website and the web sites of other organizations wishing to list the information. One criterion for certification would be compliance with the whale watch guidelines. Failure to comply at a predetermined level would result in a loss of certification the following year and the company would be listed on the Web site(s) as a non-sanctuary certified operation.

Rationale: The MMVS WG agreed that the current Whale Watching Guidelines provide substantial protection for whales from ship strikes by whale watching vessels. Therefore, the primary goal of the SBNMS in terms of protecting whales from vessel strike is to significantly improve compliance with those guidelines. A certification program would make all vessel operators knowledgeable about the guidelines and the need to comply with them by mandating attendance at an annual workshop(s). It would also provide a significant incentive for compliance through the posting of certified and non-certified companies on the sanctuary website and the websites of other organizations wishing to do so. One task of the sanctuary would be to link the certification listing to as many sites as possible in order to create the widest dissemination of the information, thereby increasing the pressure on companies to comply with the certification criteria.

Criteria for certification could include:

- Attendance at an annual meeting covering whale watch guidelines and other pertinent information
- Compliance with whale watch guidelines at predetermined levels
- Display of Whale Watch Guidelines at ticket booths and onboard vessels
- Participation in real-time sightings data-base for dissemination through the SBNMS Information and Reporting Center
- Other items deemed important by the sanctuary, industry and conservation groups

This option would provide the sanctuary with a mechanism to compel improved guideline compliance, while demonstrating a willingness to work with the industry to solve a mutual problem.

(C.1.5) *The sanctuary should maintain the existing Whale Watch Guideline structure and increase compliance monitoring.*

Recommendation: The sanctuary should maintain the existing Whale Watch Guideline structure and increase compliance monitoring

Rationale: The Whale Watching Guidelines of the Northeast Region (guidelines), as revised and published in 1999, represent a practical manner to engage in the safe practice of whale watch operation in the United States. They are, in fact, more detailed than the approach regulations currently in place in Hawaii and Alaska. We believe that data made available to the MMVS WG on the number of vessel contacts with large cetaceans in the sanctuary since 1999, indicated that the guidelines have been at least as effective as the results achieved through regulations in those regions. However, based on the observations made by sanctuary staff aboard whale watch vessels during the 2003 operating season, there is concern about the evidence presented which suggest a low percentage of overall compliance by whale watch vessels while operating in close proximity to whales in that year.

In order for the guidelines to be most effective, and hopefully a national model, the whale watch industry of the northeast must step up its efforts to comply as closely as practical to their application and improve compliance. Additionally, the sanctuary should take advantage of the requirement that at least some whale watch vessels install AIS by January 05. It can do this by creating the SBNMS MMIRC as described elsewhere in this report. Accordingly, the following items might help improve long-term compliance by the industry, thereby removing the need for regulation:

- The sanctuary should continue to place quiet observers aboard whale watch vessels over the next several years to track compliance with the guidelines.
- Sanctuary management and staff should share the results of theses observations with whale watch operators and crews through a series of fall or spring meetings to be held at sanctuary headquarters.
- Upon the opening of the MMIRC, the sanctuary will have the capacity to provide whale watch operators with real time information regarding the latest known location of whales. With the ability to monitor vessels from the MMIRC, staff can notify a vessel tracking on AIS if they have a concern of non-compliance.
- The sanctuary should notify vessel owners of any observation or report of apparent non-compliance of its vessels within twenty-four hours to allow whale watch companies to respond immediately to the concern.

With the improved compliance resulting from the above measures, we are confident that the guidelines will assure the protection of not only whales, but also the whale watching industry, which is a primary component of Massachusetts' tourism economy.

(C.1.6) *The sanctuary should create a sanctuary – Whale Watch Association to enable the commercial whale watch companies to work in partnership with the sanctuary on a variety of issues including the development guidelines based on research that will reduce the risk of striking a whale.*

Rationale: The sanctuary and Commercial Whale Watch Industry are interdependent. In fact, much of the implementation of portions of this plan, and others, are dependent on whale sighting reports and public access from commercial whale watch vessels (see Strategy MMVS.A.3 of this plan as well as the portions of the Marine Mammal

Entanglement, Marine Mammal Behavioral Disturbance, and Outreach WG plans). As such, the development of a cooperative sanctuary-Industry forum could result in, among other things, improved communication, access to sightings information, public outreach and development and compliance of viable whale watching guidelines. Current guidelines were not based on scientific research and compliance is often species, and weather dependent. The whale watch Industry could work with the sanctuary in developing guidelines based on cooperative research resulting in enhanced protection for the animals and increased compliance from the Industry.

Group membership requirements could include:

- Attendance at an annual meeting covering whale watch guideline development and other pertinent information such as research activities occurring within the sanctuary.
- Display of Whale Watch Guidelines at ticket booths and onboard vessels
- Participation in real-time sightings data-base for dissemination through the SBNMS Marine Mammal Information and Reporting Center
- Dissemination of materials and information provided by the sanctuary.
- Compliance with whale watch guidelines at predetermined levels
- Other items deemed important by the sanctuary, industry and conservation groups
- Membership criteria would include agreed postings of company names to be posted on sanctuary and Industry websites as well as printed materials as well as suspension notices if membership is suspended.
- Failure to meet membership criteria (meeting attendance, sightings data, compliance level, etc) could result in membership termination or suspension, which would also be noted on the sanctuary website as permitted to in the original membership agreement.

This option would provide the sanctuary, and the Industry, with a mechanism to develop workable guidelines, exchange information, and demonstrate a willingness to work with the industry to solve a mutual problem.

STRATEGY MMVS.C.2 – ENFORCEMENT

Strategy Summary

Because of the lack of consensus around the action plan and the potential reliance on voluntary measures, the group did not come to a strong agreement about the degree of enforcement, or the mechanism that was necessary to carry out enforcement activities. There was discussion about enforcement activities taking place using a dedicated sanctuary vessel, through partnership with the NOAA Fisheries and/or Massachusetts Division of Marine Fisheries (MADMF), and developing technologies such as the AIS being required on vessels greater than 65' in length starting January 1, 2005, but no agreements were reached on the need for or the priority of enforcement in most cases. However, there was agreement on one item.

Activities (3)

(C.2.1.) *The sanctuary should continue to monitor whale watch compliance with guidelines or regulations, and report to the whale watch boats when they find notable non-compliance.*

> *Rationale:* A study conducted by the sanctuary in 2003 indicated that commercial whale watching compliance with the speed zones placed around whales in the official NOAA Fisheries whale watching guidelines to minimize risk of a vessel strike, especially to an unseen whale, was inadequate and needs to be improved. The group agreed that this type of study was useful and continued monitoring would be important in determining whether whale watch boats behaved in a way that sufficiently reduced risk of collision to whales. However, they also felt that rather than waiting to give a cumulative report on compliance, as was done with the initial study, owners and operators would like to be notified as quickly as possible if they had been found out of compliance, so they could take corrective measures in a timely fashion.

(C.2.2) *It is recommended that the sanctuary work with NOAA Fisheries, MADMF, and other interested parties to develop a proposal to allow certified whale watching vessels to approach right whales within the 500-yard exclusion zone for the purpose of assessing possible entanglement and identifying individuals (through photo-identification procedures).*

(C.2.3) *The sanctuary should seek funding for dedicated vessel and additional staff to enforce regulation in the sanctuary.*

It is recommended that a sanctuary vessel be secured for permanent duty to provide a regular presence within the sanctuary. This should be for a specified number of days per year, i.e., minimum time coverage, or that teamwork with other state and federal agencies be instituted to achieve the desired coverage. There are many reasons for the presence of a sanctuary vessel, including but not limited to research, marine mammal disentanglement and stand-by, and education and outreach.

STRATEGY MMVS.C.3 – OUTREACH AND EDUCATION

The sanctuary should increase the availability of information concerning whales and whale/vessel interactions

Activities (3)

(C.3.1) *The sanctuary should provide an accreditation program to promote responsible vessel behavior around whales to avoid strikes.*

> *Rationale:* The SBNMS should offer a voluntary accreditation course to any commercial or recreational boater to provide information on whale species and common behaviors, and allow an opportunity to share information regarding safe boating around whales and ways in which collisions between boats and whales could be avoided. Attendance at this course would result in issuance of a certificate that could be advertised by the boater. Target audiences would range from captains of large commercial ships that access the

port of Boston, operators of vessels that engage in whale watching (commercial or recreational), and other boaters that transit through the sanctuary. The program could be offered through classes held at the sanctuary or, in the case of large commercial ships, through visits to the individual ship itself. Participants in such courses could be featured as having engaged in such training (e.g., on the sanctuary website, in newsletters, and other appropriate forums). One intent is to provide incentive for potential customers to choose a whale watching company whose captains had demonstrated a greater interest in risk adverse whale watching.

(C.3.2) *The sanctuary should assess current recreational boater outreach programs with continued support for effective programs where appropriate and develop supplemental materials as needed. The sanctuary should actively seek funding partnerships in support of the activities.*

Rationale: Due to the aggregation of wildlife within the sanctuary there is the potential for interactions between whales and boats. As a result, the risk of vessel collisions between whales and uninformed boaters may be high. The concerns raised by large numbers of well-meaning but uneducated boaters operating closely around large whales underscore the need to increase awareness of vessel operators of how to safely maneuver in the presence of whales. Programs to educate recreational boaters within the sanctuary have been conducted. In 2000, the International Fund for Animal Welfare (IFAW), working with the NOAA Fisheries, Massachusetts State Department, and the Center for Coastal Studies, developed "Steer Clear," a brochure sent to boaters registered in Massachusetts. Additionally, The International Wildlife Coalition, in conjunction with the sanctuary developed a multi-phase, multi-year program called "See A Spout, Watch Out! Responsible Whale Watching" in an attempt to increase awareness to recreational boaters about whale watching guidelines within the sanctuary. Currently, the IFAW, in conjunction with the Northeast Implementation Team, is creating a series of outreach materials concerning vessel strikes of right whales. The sanctuary should partner with existing programs where possible, and develop supplementary materials as needed to make sure that recreational boaters are aware of the presence of whales in the SBNMS, and how they should behave to minimize the risk of striking one.

(C.3.3) *The sanctuary should have a regular presence on Stellwagen Bank.*

STRATEGY MMVS.C.4 – RESEARCH

The sanctuary should conduct and support additional research to understand and minimize the risk of vessel strikes to marine mammals.

Activities (7)

(C.4.1) *The sanctuary should increase the information available about right whale use of the SBNMS.*

Rationale: The great majority of our information of whale use of the SBNMS has come from long term databases derived from sightings from commercial whale watch boats, which typically operate from April through October. In addition, there are several marine mammal-oriented research vessels that typically operate during the same period, with perhaps a bit more coverage on the seasonal fringes. However, there is little sighting effort for marine mammals during the period from November through April. During this time, consistent right whale use of Cape Cod Bay has been documented from December through April, and use of Jeffreys Ledge has been documented in the fall and early winter. Aggregations of up to thirty right whales have been seen in Stellwagen Basin, and within the borders of the SBNMS, in opportunistic early spring cruises. Right whales are of particular concern to the SBNMS because of their extreme endangered status. In order to assess the risk of a right whale strike in the sanctuary, more systematic data is needed on the presence of these animals in the SBNMS in the period from October through April.

(C.4.2) *The sanctuary should conduct a year round monitoring study that would identify every vessel type, size, and route of each vessel while in the sanctuary. This study could serve as the basis for other research projects for management practices. Additionally, the sanctuary should continue trackline survey studies to monitor the spatial and temporal distribution of whales and vessels in the sanctuary. Finally, the sanctuary should monitor trends in vessel use (vessel types and numbers using the sanctuary, new vessel designs, etc.) over years.*

Rationale: In order to minimize the risk of collision to whales, it is important that the sanctuary understand the nature of the risk, both whales and vessels. While there is good baseline data for the numbers of certain types of boats that use the SBNMS (e.g., commercial shipping vessels, whale watch vessels, cruise liners) there are many classes of boats for which similar data is lacking. A single comprehensive study would give a stronger picture of where threats lie and, as a result, management strategies could be developed where necessary. The trackline studies also provide insight into not only the numbers, kinds, positions, and routes of vessels in the SBNMS, but also where vessels overlap with marine mammals. Finally, the SBNMS needs to monitor trends in vessel use over time. This should include both changes in the amount of use of different vessel types throughout the sanctuary, but also innovations in vessel design. These should be evaluated in relation to their risk to whales as they are introduced and/or trends become clear.

(C.4.3) *The SBNMS/NOAA Fisheries should maintain an ongoing database of all details around any known strikes in and around the sanctuary.*

Rationale: recently, Jensen and Silber (2003) published a detailed list of known vessel strikes. However, the authors are unsure at this point as to whether the database will continue to be updated, or if their efforts will cease with the publication of the document. Throughout the discussions of the working group, the lack of information on strikes was noted repeatedly as limiting the group's ability to determine what may or may not be appropriate mitigation measures. The group feels that it is essential that an ongoing database be maintained of vessel strikes. The information kept on each strike should be

as complete as possible, including vessel type, speed and activity at the time of collision, whether the whale had been seen prior to the collision, the extent of the injury to the whale, the long term effect of the strike to the whale, etc. Only by gathering this kind of detailed information over time will the understanding of the nature of vessel strikes increase. This could be done in conjunction with the Northeast Fishery Science Center of NOAA Fisheries.

(C.4.4) *The sanctuary should investigate research strategies to determine responses of whales to approaching vessels to better understand the nature of vessel collisions and to help manage the approaches of vessels to whales.*

Rationale: Guidelines governing vessel approaches to whales (specifically for the purpose of commercial or private whale watching) have been in place in New England and elsewhere for many years. These guidelines have been designed to prevent collisions with whales, and also to minimize the potential for behavioral disruption and harassment. However, neither these guidelines (nor regulations in place elsewhere, e.g. in Hawaii) have been based upon the results of directed, controlled studies. While there may be good precautionary reasons for the sanctuary to codify existing NOAA Fisheries speed approach guidelines into regulations within the sanctuary (e.g., Laist, et al., 2001), the group recommended that scientific studies be undertaken in the near future. Such studies should include how whales react to approaching vessels, including the range at which a whale reacts, whether they make consistent attempts to avoid vessels, as well as other factors regarding the nature of whale behavior as it relates to vessel collisions. Ideally, such work would also include an element to look at behavioral disturbances of whales by approaching vessels in order to answer questions framed by the behavioral disturbance working group.

(C.4.5) *The sanctuary should investigate use of forward-looking sonar or other real-time detection equipment to notify vessels of whales in their path.*

Rationale: The group agreed that presently there is no device that would give a mariner sufficient warning that there is a whale in his/her path in a manner which would avoid a strike, especially by a large commercial vessel. However, as technology increases, it may be possible in the future to equip vessels with a device that may grant them sufficient warning. The sanctuary is encouraged to partner with other researchers to fully explore this possibility. However, the group recognizes the concern expressed by the marine mammal behavioral disturbance working group that such devices could add a human-produced sound that might be detectable and/or disturbing to some marine mammals, especially Odontocetes. This concern needs to be addressed when evaluating the use and feasibility of such devices.

(C.4.6) *The sanctuary should develop a toll free number to allow callers to anonymously report strikes to the sanctuary.*

Rationale: Vessel operators who believe that reporting a strike is likely to result in some type of repercussion are unlikely to report that strike. More than half of strike data from

the greater sanctuary area is from unknown sources and circumstances. This type of system may increase the information thereby allowing the sanctuary to determine the best mechanism to reduce risk to whales.

(C.4.7) *The sanctuary should investigate ways in which jet-propelled vessels can operate most safely around small marine mammals.*

Rationale: While the focus of this group was on vessel strikes of large whales, there was concern expressed that the high-powered water intake of large jet-propelled vessels represented a threat to smaller marine mammals, including dolphins, porpoises, and seals. As this technology becomes more prevalent, the risk to smaller marine mammals may increase accordingly. The sanctuary is encouraged to investigate the extent of this threat, and whether there are any measures that could be used (including screens over intake valves) to maximize the safety of these vessels for marine mammals.

STRATEGY MMVS.C.5 – EMERGING ISSUES

The sanctuary should be aware of emerging issues that might impact the SBNMS and take proactive actions to understand and minimize their impact.

Activities (3)

(C.5.1) *The sanctuary should understand military vessels and their use of the SBNMS.*

Rationale: While military use of the SBNMS is not known to be at a high level at this time, there is the chance that it could increase in the future. Many military vessels travel at high speeds, operate with minimal ship noise output, and are exempt from many regulations to which other vessels are subject. Hence, the risk of a whale strike in the SBNMS might increase if use of the area were to change. The SBNMS should monitor military use of the area and work with the military to minimize the risk to which whales are exposed without compromising national security.

(C.5.2) *The sanctuary should understand short sea shipping and how that might impact the SBNMS.*

Rationale: During the fall and winter of 2003/4 there were several white papers and popular articles that appeared discussing the potential for using short sea shipping to transport goods within Massachusetts. This plan would reduce congestion on local highways by using smaller commercial freight carrying vessels to ship materials within the state or to other nearby ports. While much of this traffic might occur entirely outside of the bounds of the SBNMS, there are foreseeable routes that would cross the sanctuary. SBNMS should monitor the level of short sea shipping to determine if there is any increased risk of marine mammal collision due to notable increases in vessel traffic.

(C.5.3) *The sanctuary should understand new cruise destinations and ports.*

Rationale: As Boston and surrounding New England ports become more desirable as places to visit, it is foreseeable that local ports might create new facilities for cruise ships to make ports of call along their itineraries. One such facility was recently announced for Gloucester, Massachusetts, which hopes to increase cruise ship calls by over 100% in the next few years. This may also lead to an increase in the number and routes through which both small coastal and heavy cruise ships will transit the area. The SBNMS should monitor such developments, and assess the amount (if any) of increased risk of vessel collision to marine mammals. Further, if such developments warrant it, the SBNMS should consult with the cruise ship industry to minimize risk of collision.

EXHIBITS

EXHIBIT MMVS.I – Recorded Vessel Strikes to Baleen Whales Within the Greater SBNMS Area; 1984 – 2003.

No.	Date	Sp	Location	*Mortality*	Vessel Type	Speed (Kt)	Length (m)	Comments
1	7/1/2002	Finback	Off Provincetown	ND	WW			OLE
2	10/4/2001	Humpback	SBNMS	I	WW	11.7 (13)	ND (130')	Jensen & Silber, 2003
3	8/25/2001	Humpback	SBNMS	I	Rec	ND	ND	Asmutis
4	6/1/2001	ND	MA	ND	U.S. Navy	ND	ND	OLE Report
5	7/29/2000	Humpback	MA	ND	Sport Fish	ND	ND	Jensen & Silber, 2003; Carlson Corinthian
6	5/14/2000	Humpback	SBNMS	ND	ND	ND	ND	Jensen & Silber, 2003
7	4/20/1999	Right	CCB	M	ND	ND	ND	Jensen & Silber, 2003; Floater(Staccatto)
8	6/23/1999	Minke	BH	SI	ND	ND	ND	Jensen & Silber, 2003; Necropsy
9	9/12/1998	Minke	CCB	M	WW	25 (28)	24 (110')	Jensen & Silber, 2003; Date corrected
10	8 12-98	Humpback	SBNMS	SI	WW	18.3	36 (120')	Jensen & Silber, 2003; (Zenith); Date corrected
11	1998	Finback	SBNMS	SI	WW	28	130'	Carlson
12	6/7/1998	Humpback	Wildcat	ND	Merchant	ND	ND	Jensen & Silber, 2003; 2 animals; Location corrected
13	5/24/1998	Minke	SBNMS	I	ND	ND	ND	Jensen & Silber, 2003
14	8/10/1997	ND	SBNMS	ND	ND	ND	ND	Jensen & Silber, 2003
15	7/20/1997	Humpback	Cape Cod Bay	ND	USCG	20	82.3	Jensen & Silber,2003
16	5/12/1997	Finback	BH	M	ND	ND	ND	Jensen & Silber, 2003; Floater
17	7/15/1996	Minke	RP	No InJ	FERRY?	15	ND	Jensen & Silber, 20003
18	3/25/1996	Right	Welfleet	M	ND	ND	ND	Jensen & Silber, 2003; Necropsy
19	11/17/1994	Sei	BH	M	Container	ND	ND	Jensen & Silber, 2003; On Bow
20	7/19/1994	Humpback	SBNMS	ND	ND	ND	ND	Jensen & Silber, 2003
21	8/11/1993	Humpback	SBNMS	I	Rec. ww			Fracture (report)
22	Aug-93	Finback	BH	M	ND	ND	ND	Jensen & Silber, 2003

No.	Date	Sp	Location	*Mortality*	Vessel Type	Speed (Kt)	Length (m)	Comments
23	6/21/1991	Humpback	SBNMS	I	WW	5-10 (7.5)	14 (46')	Jensen & Silber, 2003; Rocker
24	6/8/1990	Humpback	SBNMS	ND	ND	ND	ND	Jensen & Silber, 2003
25	6/1/1990	Humpback	SBNMS	I	Private Fish	11.5		Filament
26	5/13/1988	Minke	Duxbury	M	ND	ND	ND	Jensen & Silber, 2003; Stranded-prop wounds
27	1/15/1988	Finback	Marshfield	M	ND	ND	ND	Jensen & Silber, 2003; Poss. Ship Str
28	8/18/1987	Finback	BH	M	ND	ND	ND	Jensen & Silber, 2003; Folded in half
29	8/7/1986	Right	MA Bay	M	ND	ND	ND	Jensen & Silber, 2003; Severed spine
30	8/22/1985	Humpback	SBNMS	I	WW	6	60'	Jensen & Silber, 2003; (Weinrich)
31	7/13/1985	Finback	SBNMS	ND	ND	ND	ND	Jensen & Silber, 2003
32	1984	Finback	SBNMS	I	WW	12	80'	Wiley
33	Aug-84	Finback	SBNMS	ND	WW	16 (19)	28 (100')	Jensen & Silber, 2003

[1]Codes: ND = Not Determined; I = Injury; SI = Serious Injury, possibly leading to mortality; M = Mortality, WW = Whale Watch Vessel
[2]If exact dates were not known, inteviewees provided their best recollection as to month and year or year.

EXHIBIT MMVS.II – Vessel strikes to baleen whales along the eastern seaboard of the United States between 1979 and 2002. The Stellwagen Bank NMS area has one of the highest concentrations of recorded strikes in the region. Data source: Silber et.al. 2003.

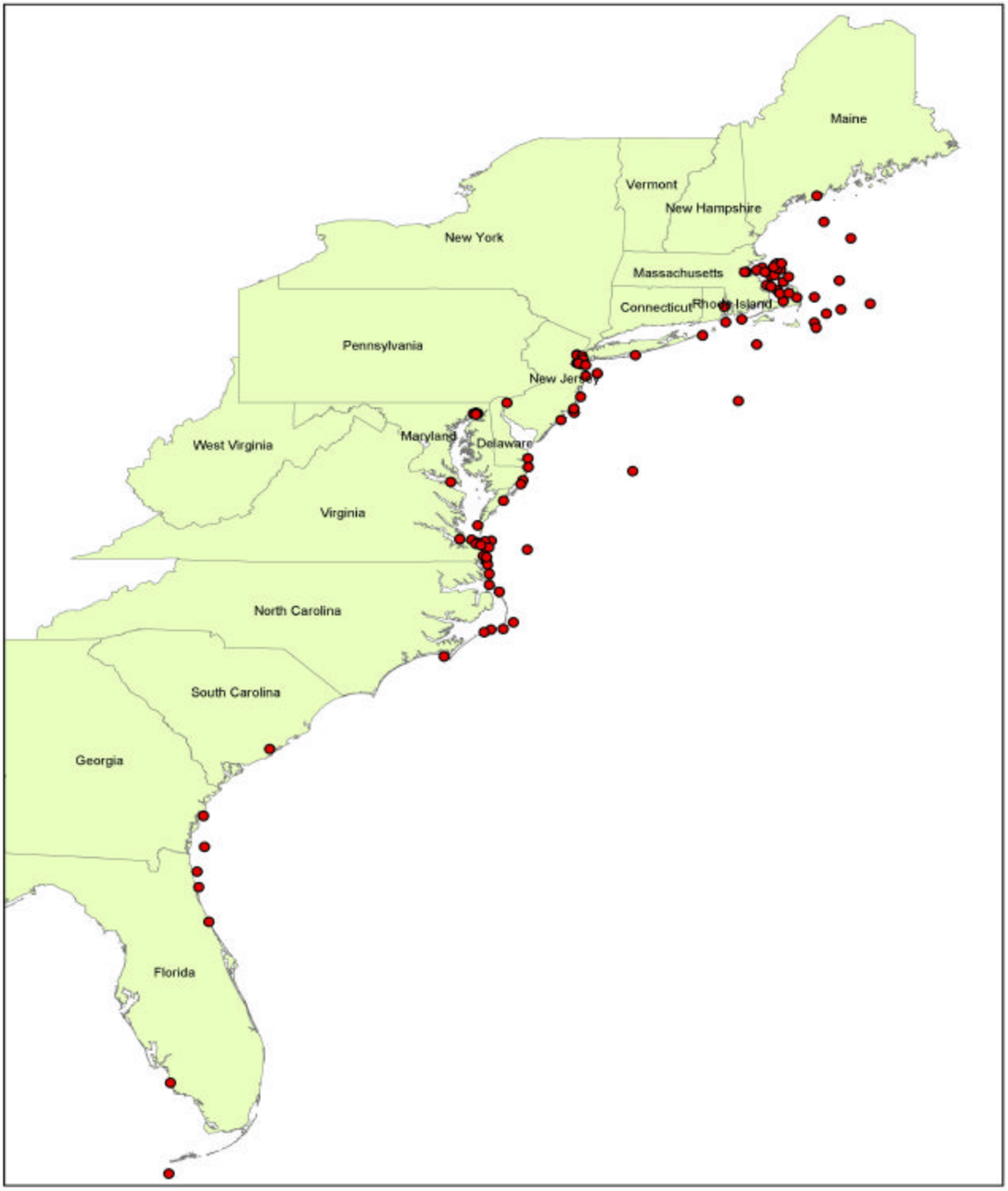


EXHIBIT MMVS.III – Vessel Strikes within the Greater Stellwagen Bank Area by Species and Year (1984 – 2003)

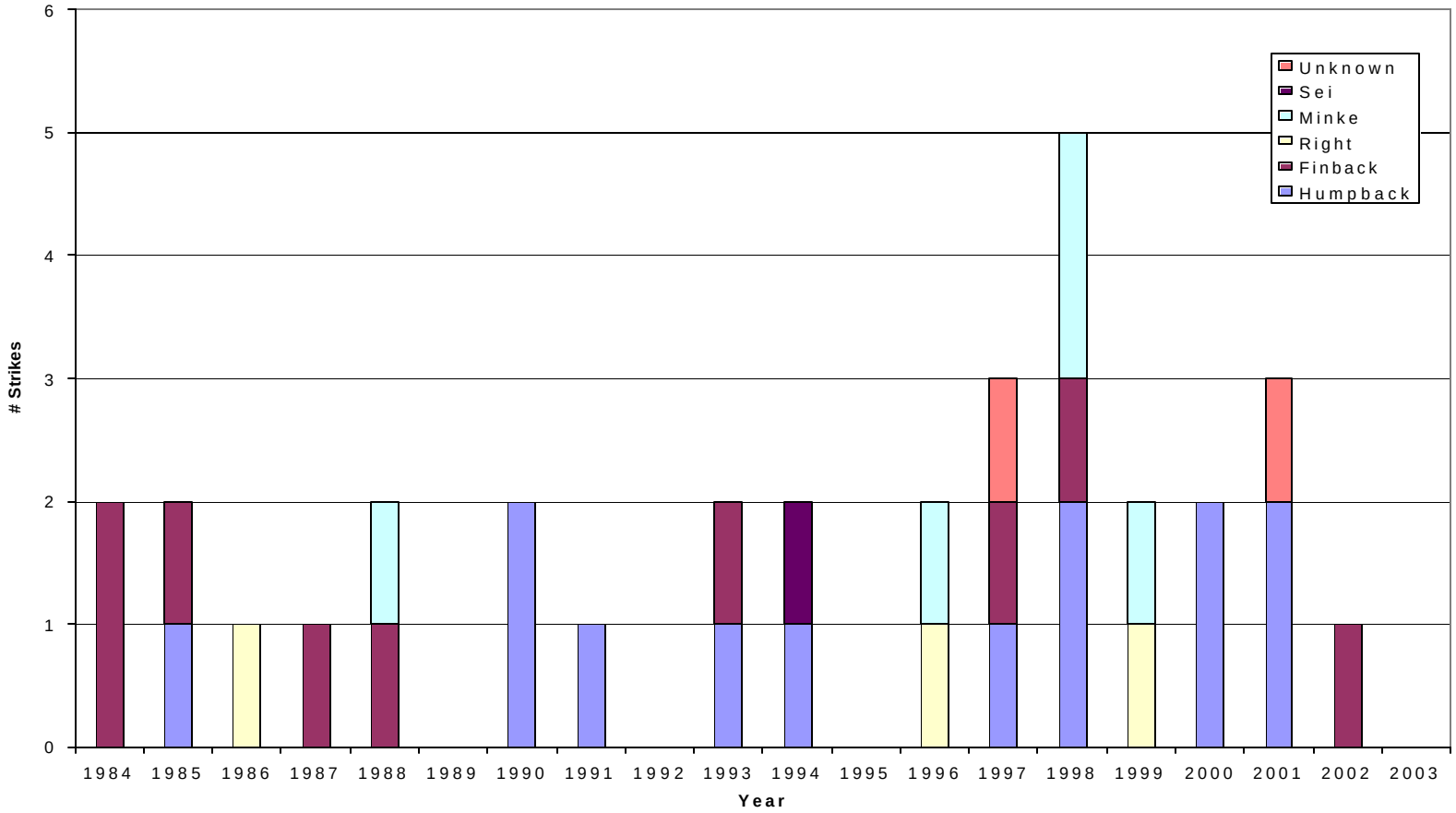


EXHIBIT MMVS.IV – Minimum, Maximum and Average Speed of Commercial Whale Watching Boats Relative to the Number of Vessel Strikes to Whales by Commercial Whale Watching Boats.

The mean number of strikes per year nearly tripled from 0.29 whales per year when the average speed was ~14 knots or less (1984 – 1997), to 0.83 animals per year when average vessel speed exceeded 19 knots (1998 – 2003). Vessel speeds calculated from data provided by Whale Center of New England.

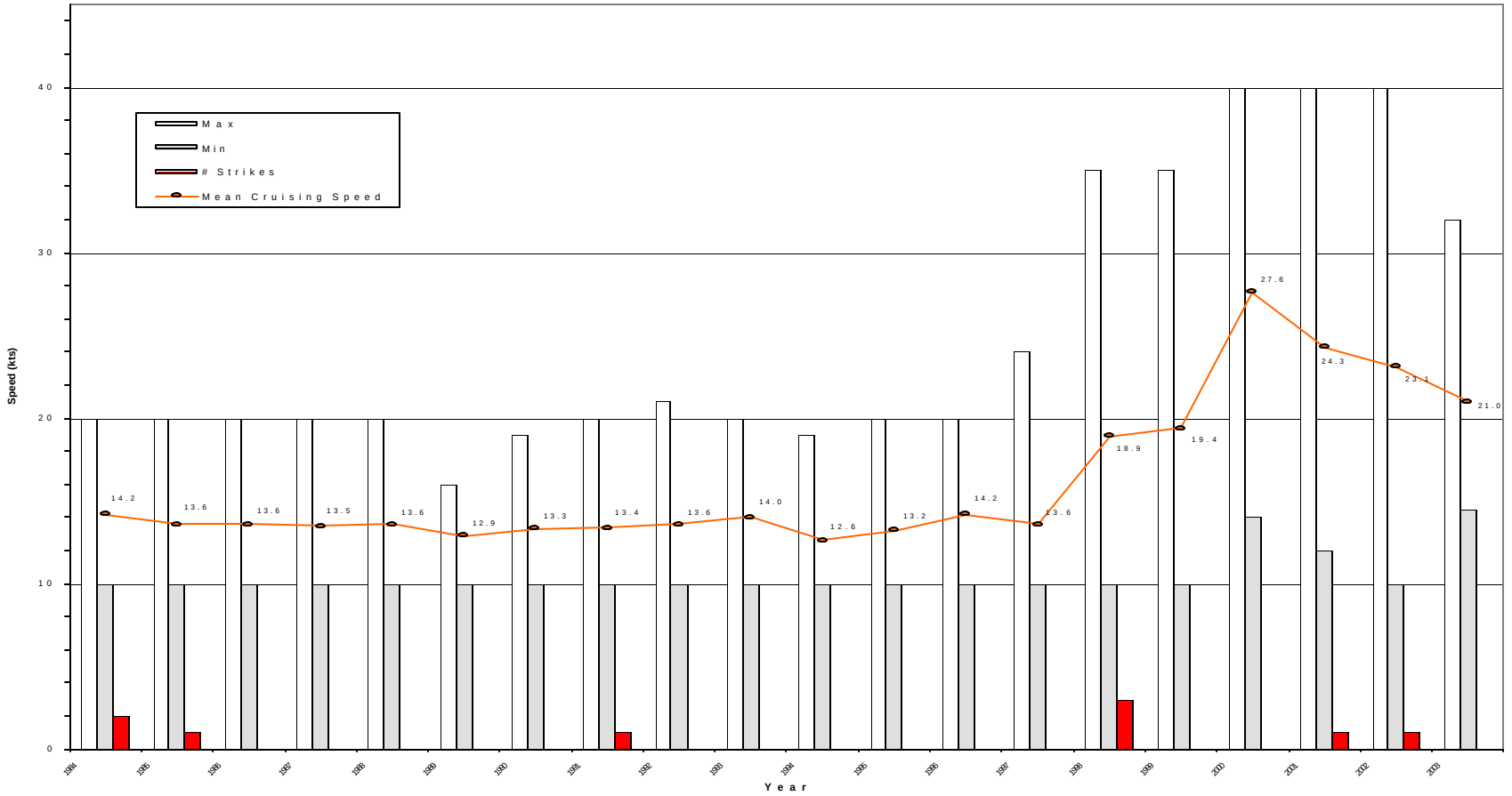


EXHIBIT MMVS.V – Worldwide Ship Strikes Involving Whale Watch Vessels

Whale Watch Strike Data

Date	Source	Area	Species	Age class	Vessel Type	Boat Length	Weight	Speed	Injury?
10/4/2001	Silber	Stellwagen	Humpback	J	Head	130		13	Minor
9/12/1998	Silber	Stellwagen	Minke	unk	Head	110		28	Killed
8/12/1998	Silber	Stellwagen	Humpack	J	Cat	120		18	Serious
1/1/1998	Carlson	Stellwagen	Fin	unk	Head	130		28	unk
6/12/1991	Silber	Stellwagen	Humpback	unk	Head	46		7.5	Minor
8/25/2001	Carlson	Stellwagen	Humpback	calf					Minor
8/1/1984	Silber/Weinrich	Stellwagen	Fin	A	Head	100		19	Ser/Killed
8/22/1985	Weinrich	Stellwagen	Humpback	J	Head	60		6	Minor
8/27/1998	Menard	Gulf of St Law.	Fin		Head	45		10	unk
9/27/1997	Silber	Gulf of St Law.	Humpback	unk	Inflatable			rapid	Min/Maj
9/26/1995	Silber	Gulf of St Law.	Minke	unk	Inflatable	35		35	unk
8/14/1994	Silber	Gulf of St Law.	Fin	unk	Head				Wound
7/29/1993	Silber	Gulf of St Law.	Fin	unk	Head			6	Wound
6/20/1992	Silber	Gulf of St Law.	Fin	unk	Head				Wound
1/2/1995	Silber	California	Gray	unk	Head				Unk
4/4/2002	Silber	SE Alaska	Humpback	unk	Cat			0	None
2/13/2001	Silber	SE Alaska	Humpback	J	Cat	58		17	Minor
2/8/2001	Silber	SE Alaska	Humpback		Inflantable	39		15.6	Min/Maj
8/11/1998	Silber	SE Alaska	Humpback		Cat	78		2	None
5/30/1997	Silber	SE Alaska	Unk		Head	59		20	Unk
1/1/1984	Wiley	Stellwagen	Fin	A	Head	80		12	Major
1/16/1996	Silber	Hawaii	Humpback		Cat	80		9	None/Minor
2/10/2003	Lammers	Hawaii	Humpback	J	Head				None/Minor
3/7/2003	Lammers	Hawaii	Humpback		Head			16	Minor
2/1/2001	Herman et al.	Hawaii	Humpback	A	Head			>18	Major
2/7/2001	Herman et al.	Hawaii	Humpback		Head			>18	None/Minor
7/1/1997	Fleming	Norway	Sperm	A	Head			5	None
8/11/1997	Gowans	Halifax, NS	Fin		Head	40		5	None/Minor
8/15/1997	Gowans	Halifax, NS	Fin	A	Head	40		0	None
9/1/1997	Gowans	Halifax, NS	Humpback		Head	40		0	None
8/1/1997	Phillips	San Juan Islands	Killer	A	Cat	110		5	None

Date	Source	Area	Species	WW or Transit?	Whale Behavior	Focal animal?	Seen prior to collision?
10/4/2001	Silber	Stellwagen	Humpback	Transit	Travel	n	n
9/12/1998	Silber	Stellwagen	Minke	Transit		n	n
8/12/1998	Silber	Stellwagen	Humpack	Leaving whales	Travel	n	n
1/1/1998	Carlson	Stellwagen	Fin	Transit		n	n
6/12/1991	Silber	Stellwagen	Humpback	Transit		unk	unk
8/25/2001	Carlson	Stellwagen	Humpback				
8/1/1984	Silber/Weinrich	Stellwagen	Fin	Transit		n	n
8/22/1985	Weinrich	Stellwagen	Humpback	WW	Deep feed	n	y
8/27/1998	Menard	Gulf of St Law.	Fin	leaving whale		y	y
9/27/1997	Silber	Gulf of St Law.	Humpback	Aproaching whale		y	y
9/26/1995	Silber	Gulf of St Law.	Minke	transit		n	n
8/14/1994	Silber	Gulf of St Law.	Fin	WW			
7/29/1993	Silber	Gulf of St Law.	Fin	WW		n	n
6/20/1992	Silber	Gulf of St Law.	Fin	WW		y	y
1/2/1995	Silber	California	Gray				
4/4/2002	Silber	SE Alaska	Humpback	WW		y	y
2/13/2001	Silber	SE Alaska	Humpback	Transit			
2/8/2001	Silber	SE Alaska	Humpback	Transit			
8/11/1998	Silber	SE Alaska	Humpback	WW		y	y
5/30/1997	Silber	SE Alaska	Unk	Transit			
1/1/1984	Wiley	Stellwagen	Fin	WW		n	n
1/16/1996	Silber	Hawaii	Humpback	WW			
2/10/2003	Lammers	Hawaii	Humpback	Transit		n	n
3/7/2003	Lammers	Hawaii	Humpback	Transit		n	n
2/1/2001	Herman et al.	Hawaii	Humpback	Transit	Travel	n	n
2/7/2001	Herman et al.	Hawaii	Humpback	Transit		n	n
7/1/1997	Fleming	Norway	Sperm	WW	Deep feed	y	n
8/11/1997	Gowans	Halifax, NS	Fin	WW	Trav/deep feed	y	n
8/15/1997	Gowans	Halifax, NS	Fin	WW	Deep feed	n	n
9/1/1997	Gowans	Halifax, NS	Humpback	WW			
8/1/1997	Phillips	San Juan Islands	Killer	WW	Rest/Slow trav	y	n

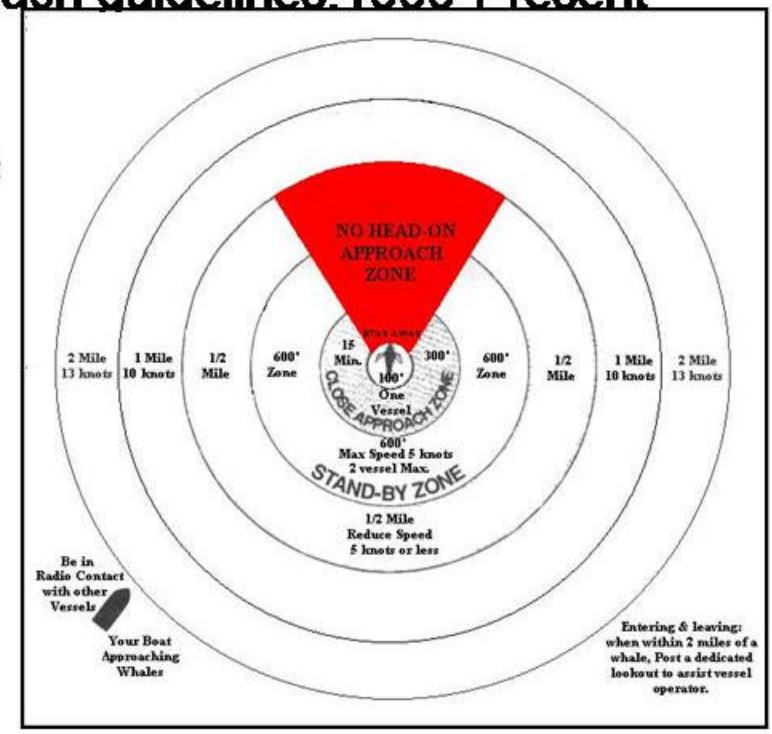
Date	Source	Area	Species	Other whales - 1 r	Other whales - 2 km?	
10/4/2001	Silber	Stellwagen	Humpback	n	n	
9/12/1998	Silber	Stellwagen	Minke	y	y	
8/12/1998	Silber	Stellwagen	Humpack	y	y	
1/1/1998	Carlson	Stellwagen	Fin	n	y	
6/12/1991	Silber	Stellwagen	Humpback	unk	unk	
8/25/2001	Carlson	Stellwagen	Humpback	y	y	
8/1/1984	Silber/Weinrich	Stellwagen	Fin	n	y	
8/22/1985	Weinrich	Stellwagen	Humpback	y	y	
8/27/1998	Menard	Gulf of St Law.	Fin			
9/27/1997	Silber	Gulf of St Law.	Humpback	y		
9/26/1995	Silber	Gulf of St Law.	Minke			
8/14/1994	Silber	Gulf of St Law.	Fin			
7/29/1993	Silber	Gulf of St Law.	Fin	y	y	
6/20/1992	Silber	Gulf of St Law.	Fin			
1/2/1995	Silber	California	Gray			
4/4/2002	Silber	SE Alaska	Humpback			
2/13/2001	Silber	SE Alaska	Humpback			
2/8/2001	Silber	SE Alaska	Humpback			
8/11/1998	Silber	SE Alaska	Humpback			
5/30/1997	Silber	SE Alaska	Unk			
1/1/1984	Wiley	Stellwagen	Fin	y	y	
1/16/1996	Silber	Hawaii	Humpback	y	y	
2/10/2003	Lammers	Hawaii	Humpback			
3/7/2003	Lammers	Hawaii	Humpback			
2/1/2001	Herman et al.	Hawaii	Humpback			
2/7/2001	Herman et al.	Hawaii	Humpback			
7/1/1997	Fleming	Norway	Sperm	y	y	
8/11/1997	Gowans	Halifax, NS	Fin	y	y	
8/15/1997	Gowans	Halifax, NS	Fin	y	y	
9/1/1997	Gowans	Halifax, NS	Humpback			
8/1/1997	Phillips	San Juan Islands	Killer	y	y	

APPENDICES
(MARINE MAMMAL VESSEL STRIKE)

APPENDIX MMVS.I – Whale Watch Guidelines for Northeast Region

Appendix I:
NER approach guidelines:1999-Present

- **Speed reductions within 2 nautical miles (nm):**
  - **-13 kts between 1-2 nm**
  - **-10 kts between .5-1nm**
  - **- 7 kts .5nm or less**
- **Post dedicated lookouts**
- **Avoid head-on approach**
- **No approach within 100'**



APPENDIX MMVS.II – Regulatory Authority to Manage Shipping within the SBNMS

NOAA Position:

Summary of the May 17th Informal Discussions with Stellwagen Bank National Marine Sanctuary (NMS) Representatives, NOAA Fisheries/Protected Resources (PR), General Counsel for International Law (GCIL), General Council for Ocean Service (GCOS), and General Counsel for Fisheries (GCF) on the International Legal Framework for Addressing Restrictions on Vessels to Reduce Ship Strikes of Marine Mammals

Although it is not now known precisely what the measures are being considered for implementation to reduce ship strikes of marine mammals in Stellwagen Bank National Marine sanctuary, there are measures that may be taken consistent with international law to regulate vessels. Particular measures would have to be analyzed under the principles outlined below to ensure consistency with international law.

Does the National Marine Sanctuary Program (NMSP) have the authority to regulate operations of U.S.-flagged vessels in the SBNMS? Yes. The NMSA, as amended, 16 U.S.C. sec. 1441-1445a, provides that "the Secretary [of Commerce][delegated to NOAA] may issue such regulations as may be necessary to carry out this [act]." 16 U.S.C. sec. 1439. This provision gives the NMSP broad authority to promulgate regulations governing any activity in order to protect and manage sanctuary resources. An example is regulation of the operation of any vessel.

U.S.-Flagged Vessels

Under international law, each State has the right to regulate its domestic vessels. GCF and GCOS will provide advice on whether NOAA has domestic legal authority to take a particular regulatory action regarding U.S.-flagged vessels and ship strikes.

Foreign-flagged vessels entering U.S. ports

As a matter of international law, the United States has always considered that a country has extensive authority to regulate ships entering its ports. (See, e.g., the 96 hour prior call in requirement). As a legal matter, the United States has neither limited this authority geographically nor by the type of legitimate interest being protected. The United Nations Convention on the Law of the Sea (UNCLOS) recognizes the interest of a coastal State in protection of its living marine resources, including rare and endangered species.

Foreign-Flagged Vessels in Innocent Passage Through the U.S. Territorial Sea (Seaward to 12 Nautical Miles)

A coastal State may, consistent with the UNCLOS, regulate vessels in innocent passage through its territorial sea with regard to a broad range of issues. These issues include the safety of navigation and regulation of maritime traffic, the conservation of living resources of the sea, and

the preservation of the environment of the coastal State (UNCLOS, Art. 21[1]). There are generally two limitations on this authority: (1) a coastal State may not adopt laws relating to the construction, design, equipment and manning of a vessel unless it is giving effect to generally accepted international rule and standards; and (2) a coastal State may not hamper the innocent passage of a vessel, except in accordance with UNCLOS (UNCLOS, Art. 24).

Foreign-flagged vessels transiting the U.S. exclusive economic zone (EEZ) (between 12 and 200 nautical miles)

There is no bright line between situations where a coastal State may regulate vessels in the EEZ and those where UNCLOS limits regulation to international rules and standards. The authority of a State to regulate is the strongest when it is more directly tied to the conservation, management, exploration, and exploitation of natural resources. If a decision is made to regulate vessels, there are important enforcement issues that will also have to be considered.

SBNMS Designation Document:

Article IV. Scope of Regulations
Section 1. Activities Subject to Regulations
The following activities are subject to regulation under the Act (NMSA), including prohibition, to the extent necessary and reasonable to ensure the protection and management of the conservation, recreation, ecological, historical, research, educational or esthetic resources and qualities of the area:

> h. Operation of a vessel (i.e. water craft of any description capable of being used as a means of transport) in the sanctuary (pg. A3).

Marine mammal Protection Act and the Endangered Species Act
Additional support for the ability of NOAA to regulate vessel traffic to protect marine mammals and endangered species can be found in the NOAA Fisheries Proposed Strategy to Reduce Ship Strike to North Atlantic Right Whales. (See Federal Register 69(105):30857-864 or http://www.nmfs.noaa.gov/pr/PR2/Conservation_and_Recovery_Program/msr/ship_strike.htm)

Shipping Industry Position:

The NMSA does not confer jurisdiction on the Secretary of Commerce or any SBNMS official to promulgate or enforce speed restrictions in that part of the sanctuary that includes international waters which is estimated to be 40% of the SBNMS 15CFR922.4 states in relevant part:

> "…the regulations implementing the designation shall be applied in accordance with generally recognized principles of international law and in accordance with treaties, conventions, and other agreements to which the United States is party."

International law specifying the "rules of the road" for vessels at sea provide a great deal of autonomy for masters to navigate their vessels in a manner that ensures safety to the vessel, its crew and the environment.

The proposer(s) therefore feel that SBNMS does not have the authority to control vessel movements within the sanctuary when those vessels are not engaged in fishing, mining or other activities related to exploitation of the Sanctuaries natural resources. Vessels traversing the waters of the sanctuary, not engaged in such activities, are deemed to be in a status known as "Innocent Passage". Only the USCG can enact regulations on vessels traversing the territorial seas, and only the IMO can enact regulations on vessels in International Waters. In both cases the enforcement of either type of regulation(s) falls to the USCG.

All of the SBNMS is located outside state waters, the majority of the sanctuary is in the Territorial Seas and some is in the International Waters even though those waters are within the EEZ. On 16 November 1994, the Convention on the LOS came into force. Section 3 addresses the Innocent Passage of Vessels in the Territorial Seas. Article 12 grants "Ships of all States, whether coastal or land-locked, enjoy the right of innocent passage through the territorial sea." The convention set the limit of territorial waters to 12 nautical miles, in which area the controlling state is free to set laws, regulate any use and use any resource. Vessels were given the right of "innocent passage" through any territorial waters. Beyond the 12 nautical mile limit there was a further 24 nautical mile limit, the 'contiguous zone', in which area a state could continue to enforce laws regarding activities such as smuggling or illegal immigration. Article 21 of the LOS grants "The coastal State may adopt laws and regulations, in conformity with the provisions of the Convention and other rules of international law, relating to innocent passage through the territorial sea, in respect of all or any of the following:

a. the safety of navigation and the regulation of maritime traffic;
b. the protection of navigational aids and facilities and other facilities or installations;
c. the protection of cables and pipelines;
d. the conservation of the living resources of the sea;
e. the prevention of infringement of the fisheries laws and regulations of the coastal State;
f. the preservation of the environment of the coastal State and the prevention, reduction and control of pollution thereof;
g. marine scientific research and hydrographic surveys;
h. the prevention of infringement of the customs, fiscal, immigration or sanitary laws and regulations of the coastal State.

Such laws and regulations shall not apply to the design, construction, manning or equipment of foreign ships unless they are giving effect to generally accepted international rules or standards."

The only agency authorized to control vessel movements is the USCG. The Traffic Separation scheme that traverses the southern portion of the sanctuary is not a mandatory shipping lane. It is a recommended scheme and is IMO approved, as it originates in international waters. Only the USCG has the Authority to move the lanes, change the status of the lanes, and submit the changes to IMO for approval.

Therefore the sanctuary SAC should not be giving credence to any suggestion that the sanctuary control shipping.

APPENDIX MMVS.III – A Proposed Scenario for the SBNMS Marine Mammal Information and Reporting Center as Contributed by Some WG members

An effective approach to reducing the interaction between marine mammals and vessels in the SBNMS could be through the creation of a mechanism to provide ship masters with "real time" information on the numbers and location of marine mammals. Recent advancements in geographic positioning systems (GPS) technologies, and a very recent federal mandate for commercial vessels over sixty- five feet to be part of an AIS, create a unique and timely opportunity for SBNMS The AIS is a system whereby participating vessels carry a transponder that provides a variety of information including their location, destination, speed and contact information. Therefore, it provides a means for contacting ships with information that can be used to reduce the potential for collisions with marine mammals and document their response to such information.

Accordingly, the proposer(s) recommend that the SBNMS dedicate the required resources for the build-out of the Stellwagen Bank MMIRC which would be manned 24 / 7 / 365 at its headquarters in Scituate, Massachusetts. At minimum the MMIRC should be equipped with a telephone, VHF, Single Side Band Radios, Electronic Charts of the sanctuary and receiving equipment for Automated Identification Systems (AIS). If a pilot program is desired, the MMIRC could operate at a reduced schedule to determine the feasibility and understand the logistics of such an operation.

As part of the Maritime Security Act of 2003, beginning January 1, 2005 all commercial domestic and foreign flag vessels over 65' in length operating in U.S. waters will be required to be equipped with AIS. The new technology will continuously broadcast real time tracking information for vessels so equipped, to other vessels or facilities with corresponding receiving equipment. At minimum the information transmitted by each vessel's AIS will include the vessels name, location, track line and speed.

The requirement of owners to make this financial investment to all applicable vessels creates an opportunity for SBNMS to have real time monitoring of a majority of vessel traffic within the sanctuary much sooner than had been anticipated, and makes this recommendation financially and operationally practical.

Through the development of the MMIRC, the sanctuary will be equipped to garner and broadcast all of the real time information provided to it by the boating population of the sanctuary, as it relates to the most current known location of animals. The amount of information that it receives will be directly proportionate to the number of vessels reporting. The MMIRC will have available to it, an abundance of information when the combined density of vessels and animals is highest, and the potential for conflict is greater. It will avoid blanket regulations such as course changes, specific track lines, and speed restrictions, which could elevate the risk to vessels and animals as opposed to diminishing it. It avoids the delays that will certainly result from a long and perhaps contentious public review and debate on weather or not SBNMS has the authority to create regulations which conflict with International Rules of the Road.

Following is an outline of how the MMIRC would function.

Receiving information on actual locations of marine mammals

1. SBNS would establish a hotline for mariners to report sightings. The number would be distributed to all commercial vessel operators, and could be made available to recreational owners.
2. All vessels transiting in the sanctuary will be required to report all sightings of marine mammals in and around the sanctuary.
3. SBNS would identify and publish the radio frequencies, (both VHF and single-sideband [SSB]) which the MMIRC will continuously monitor for of receiving sighting reports.
4. All commercial vessels transiting in the sanctuary will agree to provide immediate information on all sightings to the MMIRC via telephone, radio, or other mutual communication systems that they and the MMIRC may have.
5. Each report would include as much information as possible including the location, type, number, activity engaged in, and approximate track of transiting animals.

Receiving information of the actual location of commercial vessels

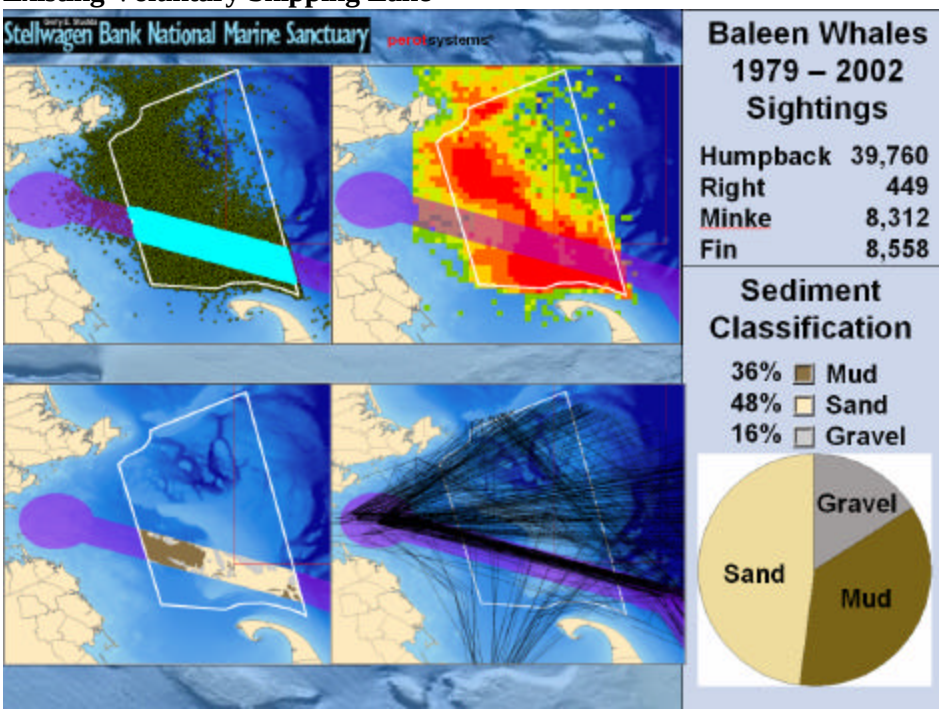
1. The MMIRC will have the potential to monitor every commercial vessel transiting in the sanctuary that are in excess of sixty-five feet through AIS. Additionally, the SBNMS could determine that all vessels without AIS report in prior to, and at the conclusion of, transiting the sanctuary. At minimum, the report would include information on the size of the vessel, intended track through the sanctuary and anticipated speed during transit.

Broadcasting or communicating to vessels within the sanctuary

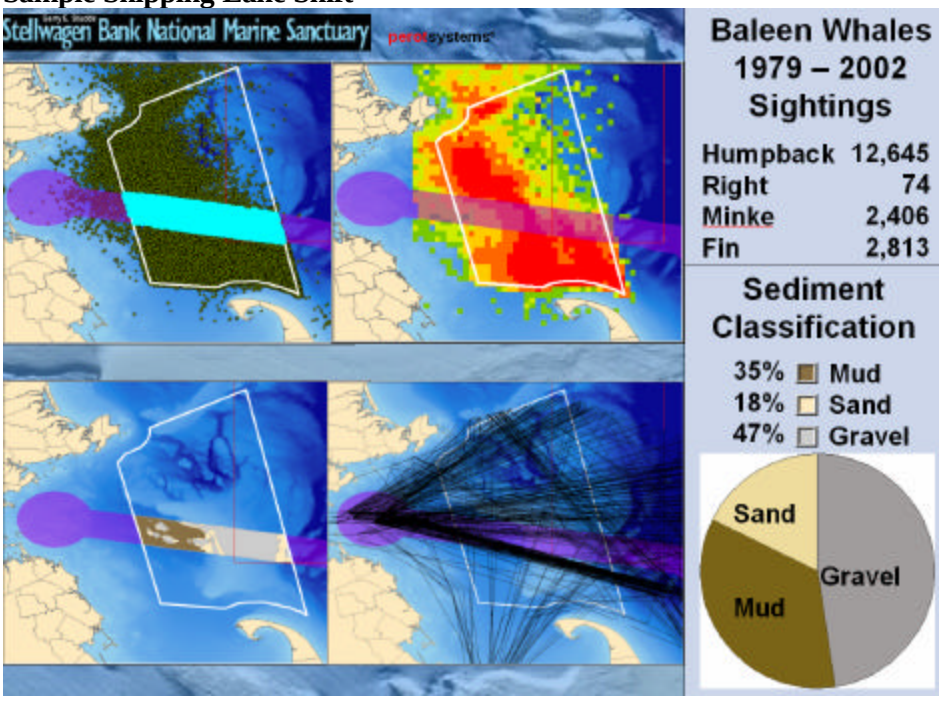
1. With the benefit of real time sighting reports, and the ability to track all vessels equipped with AIS as they transit the sanctuary, the MMIRC will communicate the most current known location of animals within it, or least those known to be in close proximity to a particular vessels intended track. Additionally, the MMIRC would request that the Master of any vessel consider an alternate track if it had serious concerns of a transit which will bring a vessel into close proximity of a known location of animal(s). The request would be made early enough, to allow the Masters of larger ships adequate time to review all of their options. The communications could be accomplished through any one of the modes available to the MMIRC.
2. To reach vessels without AIS, the MMIRC would make hourly broadcast on prescribed and advertised VHF and SSB frequencies. The broadcast would identify the most current information available on the known location of animals in and around the sanctuary. The structure and format of these communications would be similar to USCG Notice to Mariners broadcast.

APPENDIX MMVS.IV – Analysis Pertaining to Shifting the Traffic Separation Scheme (TSS) within the SBNMS (Wiley and Thompson, unpublished)

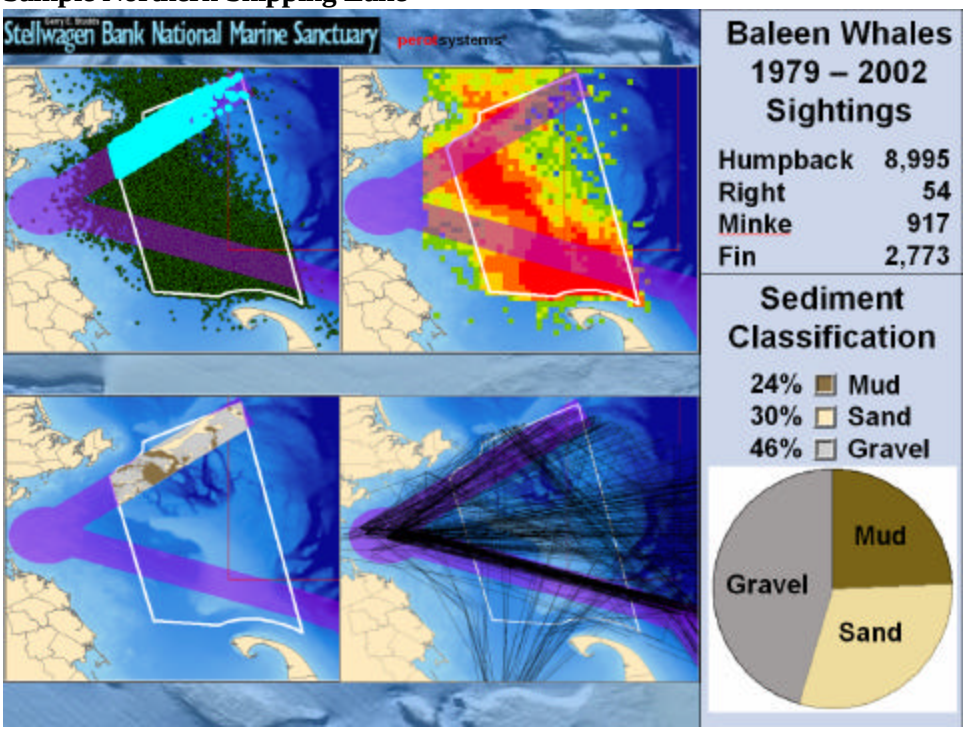
Existing Voluntary Shipping Lane



Sample Shipping Lane Shift



Sample Northern Shipping Lane



APPENDIX MMVS.V – Thoughts on Economic Considerations Provided by WG Members

1. Thoughts on Economic Impacts to Commercial Shipping
2. Thoughts on How Economic Impacts are Treated Under the Endangered Species Act
3. Additional Points Relating to the Endangered Species Act and Economic Issues
4. Thoughts on the Economic Impact of Whale Watching due to Proposed Rules within the SBNMS

1. The Port of Boston, through its deep sea container ship and cruise industries supports a sizeable workforce in the New England Region. This workforce includes the men and women that directly service the vessels (longshoremen and clerks represented by the International Longshoremen's Association) and those that drive the trucks that move the cargo (many represented by the Teamsters International Union). In addition to the direct workforce are those that support trade in New England. This includes agents, stevedores, freight forwarders and the Massachusetts Port Authority that has invested millions of dollars in port infrastructure and maintenance.

   The Port of Boston is also considered to be an "economic engine" for the region. Cruise ships calling the Port contribute to the economy of the region including traffic at Boston's Logan International Airport. Goods manufactured in the region and those purchased overseas travel through the Port.

   Some interests would like to see deep sea commercial ships and cruise ships subject to speed limits as if they were traveling down the expressway. Many of these vessels may well conclude that such restrictions will hamper their ability to make schedules that are dictated by tides and other factors beyond their control such as Panama Canal schedules. They have a viable alternative to the Port of Boston – Halifax, Nova Scotia. Various feeder services already exist including truck, rail and barge services. Needless restrictions at sea could very well result in loss of commerce to Canada – an impact on this region that would not be tolerated by business groups, labor organizations and elected officials.

2. Does consideration of economic impact play a role in decisions on rulemaking to protect endangered marine mammals?

   With regard to making listing decisions, the Endangered Species Act (ESA) states that they must be made "solely on the basis of the best scientific and commercial data available." Congress confined the term commercial data to mean trade data for the species. No consideration of economic impact is required or even allowed. But the ESA does require the U.S. Fish and Wildlife Service (USFWS) to perform an economic analysis before it designates critical habitat for an endangered species.

   If the costs associated with designating an area as critical habitat outweigh the benefits, the service may exclude that area from critical habitat, unless excluding the area would result in the extinction of the species in question. In the case of the North Atlantic right whale, the NOAA Fisheries has stated in its many biological opinions on the effect of human activities

on the species, that the death of a single right whale poses jeopardy to the continued existence of species because of the critical status of right whales. In the case of right whales, no take of the species is permitted.

Under the ESA, as it currently exists, federal agencies and non-federal persons may seek to have a particular action exempted from the penalties for taking endangered or threatened species in order to allow an activity or project to proceed even if that activity or project would destroy individuals of a listed species and might even jeopardize the continued existence of that species.

As originally enacted, the Act was an absolute prohibition against activities that would jeopardize endangered species. In the early 1980's, however, Congress established a process for granting exemptions when it established an "Endangered Species Committee" (Committee), consisting of specified Cabinet officials and one individual from each affected state to review applications for exemptions. The application must describe the Section 7 consultation process that has been carried out and provide a statement as to why the proposed action cannot be modified to conform to the requirements of the statute.
To be eligible for an exemption, the agency concerned and the exemption applicant must also provide the range of reasonable and prudent options to jeopardizing the species that were considered in the consultation, summaries of biological assessments, and an assurance that they have not made any irreversible or irretrievable commitment of resources that would foreclose the formulation or implementation of reasonable and prudent alternative measures to avoid jeopardizing the species and habitat in question. These requirements are designed to ensure that the exemption process will be a meaningful one and that the consideration of the issues will not be preempted by the commitment of resources and preclusion of alternatives through actions already taken.

The Secretary, in consultation with the other members of the Committee, holds a hearing on the application and prepares a report. The report reviews whether the applicant has made any irreversible or irretrievable commitment of resources; discusses the availability of reasonable and prudent alternatives and the benefits of each; provides a summary of the evidence concerning whether the action is in the public interest and is nationally or regionally significant; and outlines appropriate and reasonable mitigation and enhancement measures that the Committee should consider. The Committee only grants an exemption if there are no reasonable and prudent alternatives to the agency action; the benefits of the action clearly outweigh benefits of alternatives consistent with conserving the species or its habitat and is in the public interest, and that the action is of regional or national significance. It must also establish reasonable mitigation measures to minimize adverse effects on the species or its habitat; and, furthermore, the mitigation measures must be funded by the applicant. Exemptions can also be granted for national defense or in the case of natural disasters or emergencies.

There have been only a very few exemption applications filed and only two exemptions granted. One of those was in regards to a dam and the other to facilitate a timber sale. One application was denied (the Tellico dam, which was later allowed by Congress to proceed);

one was dismissed as premature (a proposed oil refinery in Maine); and two others were withdrawn before Committee consideration.

The process of obtaining an exemption is stringent and complex and it often requires that other proposed actions that may affect the species be more vigorously restricted to compensate for the harm to the species that may accrue from an exemption granted to one particular type of activity that threatens its existence. Furthermore, applying for an exemption may be perceived by the public as hostile to the conservation of a species that the public may wish to protect, such as a whale species.

In the case of imposing restrictions on commercial shipping; while economic impacts can be considered, no activity can proceed if it will jeopardize the existence of the species, no matter what the economic impacts. Only by going through a stringent exemption process can an industry request that its economic interest overrule the protection of the species. That exemption process is rarely used and even more rarely successful. Furthermore, exempting shipping from altering its activities (e.g. speed and routing) would likely result in additional restrictions to commercial fisheries, the other significant activity that poses jeopardy to right whales. Favoring shipping is likely to disadvantage commercial fishing.

When considering measures to protect whales in the SBNMS, no consideration can be given to economic impacts because NOAA Fisheries has already concluded that the current conduct of commercial shipping clearly jeopardized the species.

Material for this summary taken in large measure from the Congressional Research Service Report RL30792 of January 2001.

3. The ESA was enacted, in part, to respond to the numbers of species rendered extinct as a result of economic growth and development untempered by adequate concern and conservation. Therefore, for obvious reasons, to achieve its purposes and policies, Congress drafted the ESA in such a way to prioritize the protection and conservation of species at risk of going extinct and their habitats above all else. For example, a decision to list a species must be based "solely on the basis of the best scientific and commercial data available". In other words, the economic impacts from listing a species as either endangered or threatened are purposefully excluded from this process. The only section of the ESA that expressly permits the consideration of economic "and any other relevant impact[s]" is within the context of designating critical habitat. During the process of determining critical habitat for a listed species, the Services (NOAA Fisheries and USFWS) may exclude areas from critical habitat if the benefits of exclusion outweigh the benefits of inclusion after taking into consideration the economic and other relevant impacts. However, the Services may not exclude an area from critical habitat if it will result in the extinction of the species. The rulemaking process associated with these types of actions would require Federal agencies (including NOAA Fisheries and National Ocean Service [NOS]) to consider economic as well as other impacts, including but not limited to the National Environmental Policy Act (NEPA), the Regulatory Flexibility Act (RFA), the Administrative Procedure Act (APA), and several Executive Orders (EO), including EO 12866.

4. Thoughts on the Economic Impact of Whale Watching due to Proposed Rules within the SBNMS

Eleven different commercial whale watch companies currently depart from Massachusetts primarily targeting the SBNMS. As a result, more than 150 full time jobs and 600 part time jobs are created by the industry. This does not, however, include the additional benefit provided to local restaurants, hotels, and shops, which flourish as a result of commercial whale watching. In fact, a 1988 survey of Massachusetts whale watchers indicated that 45% of the responders said that their primary purpose was to go whale watching, and the average distance traveled to go whale watching was high, with 65% traveling more than 400 km (250 miles) (Lewis 1988). One analysis determined that the capitalized economic value of whale watching in Massachusetts was on the order of $440 million U.S. dollars (Hoagland and Meeks 1997).

Furthermore, many companies have an affiliation with a research organization, which allows ongoing photo-identification, distribution, and behavioral research to be conducted from the whale watch vessels. This additional benefit has an annual estimated value of $875,000 U.S. dollars. More than five graduate degrees and 30 peer-reviewed publications have resulted from data obtained from commercial whale watch boats (Hoyt 1994b). In fact, most of the whale distribution data acquired by the sanctuary was obtained from commercial whale watch vessels being used as a research platform.

A proposed speed limit within the sanctuary would hinder the abilities of commercial whale watch companies to fairly compete by restricting the number of trips offered by individual companies. Currently, the average whale watch trip is between three and five hours long. While the data circulated by the sanctuary shows whales utilizing almost all of the sanctuary, it is important to remember that the data presented is cumulative from over 20 years and does not take effort into account (i.e., it does not reflect how much traveling a whale watch boat did on any given day in order to obtain a single sighting -for example, a trip departing from Plymouth on June 12, 2004 traveled more than 160nm which resulted in only one sighting of a fin whale). In fact, during the past several seasons, most sightings have not occurred on the western side of Stellwagen Bank, requiring operators to travel longer distances in order to find a whale. A speed restriction in the sanctuary would result in some companies having to lengthen their trips an additional one to three hours, depending on the location of the whale. This would not allow some companies to operate more than one trip per day. Additionally, the increase in time would require an increase in cost to the consumer, which may cause consumers to choose companies that can provide shorter trips at cheaper prices. Not only would this bankrupt specific companies but would impact the dependent businesses such as the restaurants, hotels, etc. in the area that depend on the consumers targeting whale watching.

This is also true regarding the proposed ship-strike reduction plan proposed by NOAA Fisheries (impacting vessels of 20m or greater), which would decimate companies departing from ports south of Boston. This would allow less experienced and less knowledgeable companies, with vessels of <20m, to operate at high speeds while experienced operations would shut down. While there is no evidence that commercial whale watch vessels have ever struck right whales, there is evidence that experienced whale watch operations have significantly contributed to important out of season, out of habitat sightings and reports of

entangled right whales. The NOAA Fisheries plan, as written, would not only have a commercial impact but could have a significant conservation impact on the animals.

The special use permit program also proposed would have an additional economic impact on whale watching. According to the sanctuary Act, special use permit holders are required to carry liability insurance, or be bonded[5]. These costs, along with the permit fee would be transferred to the consumer, making whale watching cost-prohibitive. As this fee would only be applicable to commercial whale watch boats, it is likely that other vessels, like sport fishing boats and recreational vessels, not impacted by these fees, would increase in number increasing risk of collision to the animals. Sport fishing vessels could advertise the chance of seeing whales while fishing and ostensibly be whale watching but not under a permit and without the necessary experience and expertise. Furthermore, since these fees, and resulting regulations, would only be applicable to commercial whale watch operations, any other vessel could operate without any type of regulation in the vicinity of whales. Again, this is not only an economic burden to the commercial whale watch industry, but a conservation disservice to the animals.

Stellwagen Bank has been a destination for commercial whale watch vessels for nearly 30 years during which time more than 10 million people have visited the Bank, specifically for the purpose of whale watching. Commercial whale watching was, in large part, the impetus for the creation of the SBNMS. Public interest for the conservation of whales and their habitat was fueled by commercial whale watch companies and on board naturalists who circulated petitions and spear headed letter-writing campaigns in order to designate Stellwagen Bank as a National Marine Sanctuary. Furthermore, the sanctuary almost completely relies on commercial whale watching as a means of outreach and education (class field trips to Stellwagen Bank are roughly 10% of the market (Hoyt 1994b)), which fulfills the mandate of the sanctuary. Creating regulations, which would solely impact commercial whale watching within the sanctuary, or reduce the abilities of, at least, some companies to operate would not only reduce public access to the sanctuary but would likely result in reduced conservation, research, and outreach, a direct conflict with the mission of the sanctuary

**Note: It should be noted that the studies cited occurred more than five years ago and more recent data would likely increase the economic value of, and therefore impact to, commercial whale watching and dependent industries.*

[5] Note: It is the position of the NMSP that existing liability policies carried by whale watching boats would be sufficient.

APPENDIX MMVS.VI – Summary of Whale Watch Compliance Study

A SUMMARY OF COMPLIANCE WITH VOLUNTARY SPEED GUIDELINES BY THE COMMERCIAL WHALE WATCHING INDUSTRY IN AND AROUND STELLWAGEN BANK NATIONAL MARINE SANCTUARY

David N. Wiley[1] Just C. Moller[1,2] and Carol Carlson[3]
[1]*Stellwagewn Bank National Marine Sanctuary, Scituate, MA. 02066*
[2] *International Wildlife Coalition, 75 East Falmouth Highway, East Falmouth, MA 02536*
[3]*International Fund for Animal Welfare, 411 Main Street, Yarmouthport, MA 02675*

ABSTRACT:

Voluntary operational procedures (guidelines) have been established by the whale watching industry in the northeast region of the United States, in cooperation with government agencies and non-profit conservation organizations. Their intent is to avoid harassment and possible injury to large whales by both commercial and recreational vessels. One important aspect of these guidelines is a series of recommended speeds within various distances of the whales. To measure compliance with this aspect of the guidelines, we placed inconspicuous observers onboard thirty-five (35) commercial whale watching trips that occurred in and around Stellwagen Bank National Marine Sanctuary. Observations were made from August to October 2003. Vessel speed and position was measured using a wide area augmentation system (WAAS)-enabled GPS receiver with an accuracy of approximately 3-meters. Data were collected at five (5) seconds intervals from the time of departure from port until the vessel's return. Military-grade binoculars with internal laser rangefinder and digital compass were used to record the range and bearing to sighted whales, allowing their location to be calculated. Both data sources were processed and mapped using ArcView GIS. Compliance was evaluated by creating guideline specified speed zone buffers around the sighted whales and overlaying them with the vessel track and speed data. Speeds in excess of those prescribed by the guidelines were considered non-compliant. Result indicated that whale watching vessels often ignored speed zone guidelines and that the degree of non-compliance increased as distance from the whale(s) increased. Using *time* as the metric (i.e., how much time was spent in or out of compliance), non-compliance was 25% in Zone 1, 71% in Zone 2 and 79% in Zone 3. Using *distance* as the metric (i.e., distance traveled in or out of compliance), non-compliance was 63% in Zone 1, 92% in Zone 2, and 94% in Zone 3.

SPEED OVER TIME (T)

ZONE	T_%C	RNG_%C	T_%NC	RNG_%NC	NC_MMAX_SPD	NC_RNG
0 – 7 KT	75.4	55.1 - 93	24.6	7.0 - 44.9	17.1	13.9 - 36.7
7 – 10 KT	28.9	0 - 61.7	71.1	38.3 - 100	22.5	15.0 - 36.9
10 – 13 KT	20.8	0 - 71.1	79.2	28.9 - 100	21.9	15.0 - 37.5
OVERALL	**62.0**	**0 - 93**	**38.0**	**7.0 - 100**	**20.9**	**13.9 - 37.5**

SPEED OVER DISTANCE (D)

ZONE	D_%C	RNG_%C	D_%NC	RNG_%NC	NC_MMAX_SPD	NC_RNG
0 – 7 KT	36.7	7.5 - 67.2	63.3	32.8 - 92.5	17.1	13.9 - 36.7
7 – 10 KT	8.2	0 - 32.8	91.8	67.2 - 100	22.5	15.0 - 36.9
10 – 13 KT	6.2	0 - 39.4	93.8	60.6 - 100	21.9	15.0 - 37.5
OVERALL	**21.0**	**0 - 67.2**	**79.0**	**32.8 - 100**	**20.9**	**13.9 - 37.5**

Table headings: T or D_%C = amount of time or distance in compliance within a speed zone; RNG_%C or %NC = range of compliance or non-compliance values for a given speed zone; NC_MMAX_SPD = mean maximum non-compliant speed of all vessels in the sample within a zone; and NC_RANGE = the range of non-compliant vessel speed within each speed zone.

Time or Distance as a Metric?

There were substantial differences in compliance based on whether time or distance was used as the metric for evaluation. The reason for this difference is based on the operational procedures of the industry (e.g., Figure A, below). Data indicated that vessels tended to wait at low or idle speeds when whales were below the surface. In this mode they recorded considerable amounts of time in compliance, but covered little distance. When a whale surfaced, they rapidly increased speed until the whale was reached, at which time they slowed down. In this mode, they covered considerable distance out of compliance in a short period of time. Therefore, there was an inverse relationship between time and distance relative to speed, as evidenced by the analysis. Since discouragement of rapid travel to and among whales was the impetus for the speed zone guidelines, it seems that guideline intentions might be most accurately captured by the distance metric.

The inverse relationship between time and distance relative to speed resulted in an additional problem for using time as the compliance metric because the more rapidly a vessel traversed a distance, the more time it had to be in compliance. Therefore, a scenario could be created where the more egregiously a vessel violated the guidelines the more it would be calculated as time-compliant. This relationship was particularly problematic in Zone 1, where the faster a vessel traveled to reach a surfacing whale, the more time it had to spend at low speeds in proximity to the animal. Since the point of last surfacing is not necessarily indicative of the next surfacing and animals hit are often not the animals initially observed, such vessel behavior could be risk prone, but calculated as highly compliant. In such situations, the distance-based calculations would tend to indicate non-compliance and might be a better indictor.

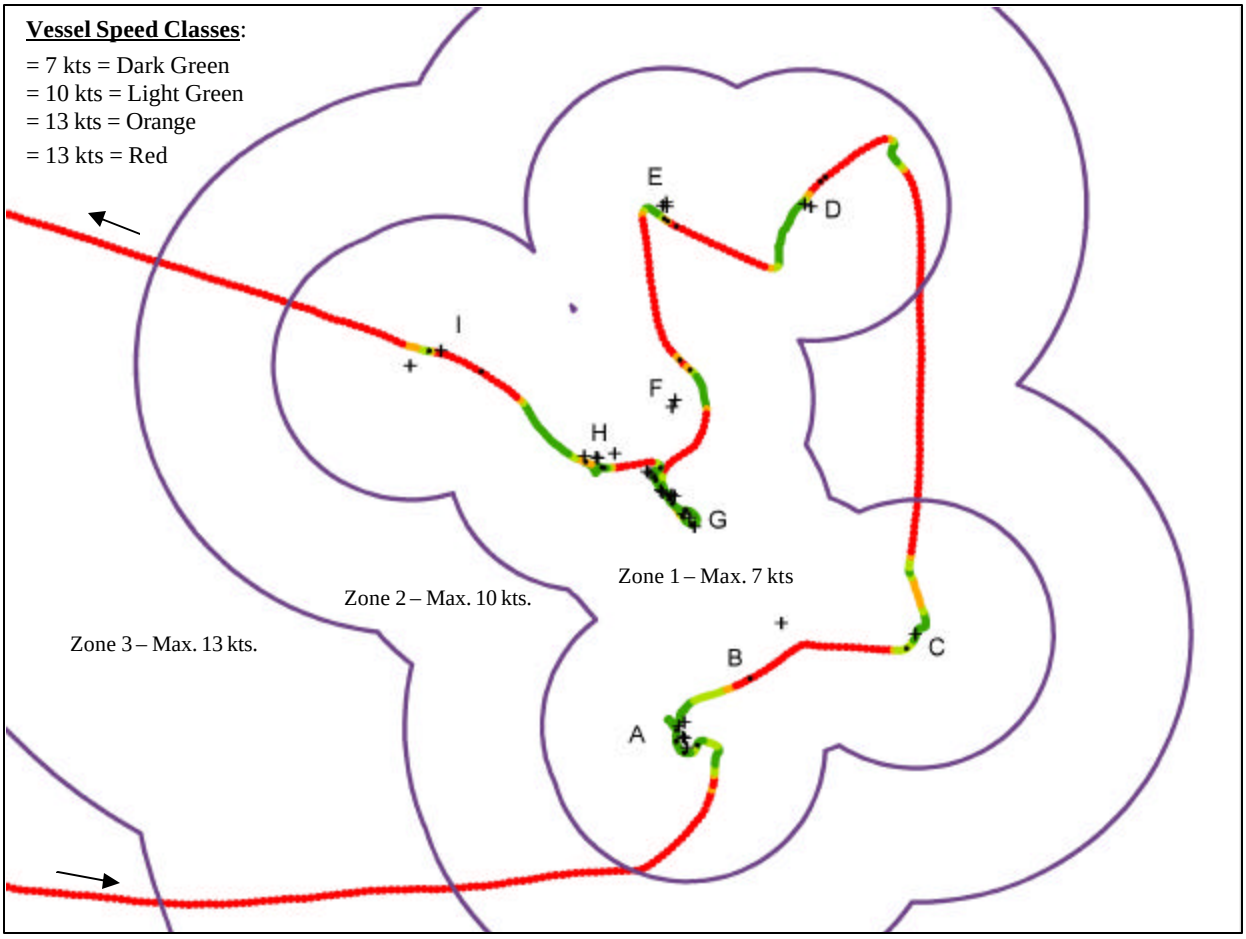


Figure A – A complex vessel track with multiple whale-viewing locations and vessel behavior characteristics. To be compliant all track in Zone 1 must be dark green (≤7 kts) only, track in Zone 2 must be dark or light green (≤ 10 kts) and all track in Zone 3 must be orange, light or dark green (≤ 13kts).

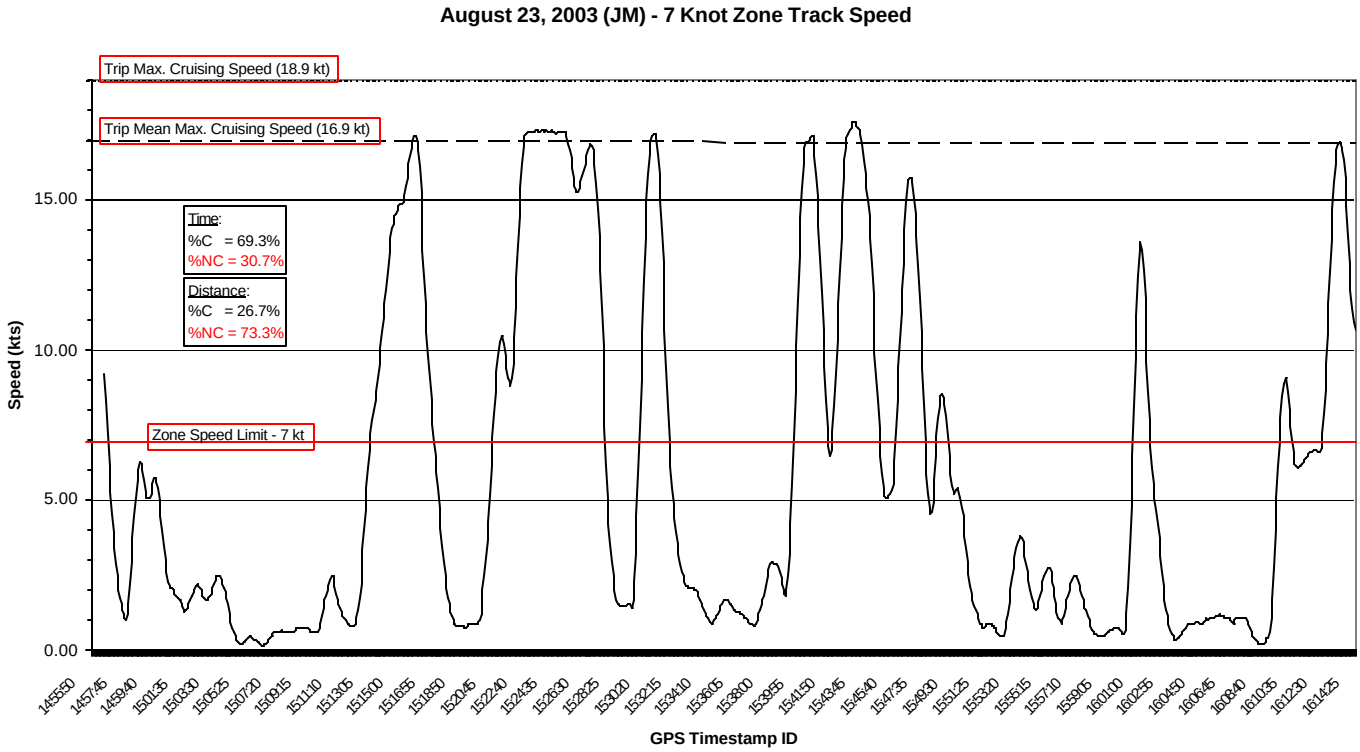


Figure B – Graph of vessel speed for Zone 1 (< 7 kts) shown in Figure A above. To be compliant, the speed should never exceed 7 kts, i.e. go above the red horizontal line delineating 7 kts.

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