Gerry E. Studds Stellwagen Bank National Marine Sanctuary
Marine Mammal Behavioral Disturbance Action Plan

Overview

Public scoping comments solicited during the *Gerry E. Studds* Stellwagen Bank National Marine Sanctuary (SBNMS) management plan review indicated concern for human disturbance of marine mammals within the sanctuary. As such, the SBNMS convened a Marine Mammal Behavioral Disturbance (MMBD) Working Group (WG) through its Sanctuary Advisory Council (SAC) to address these comments.

During this process, the MMBD WG determined that marine mammals are disturbed or have the potential to be disturbed by human-induced activities occurring within, and around, the sanctuary. The WG agreed that a number of other emerging issues, not addressed by the public scoping comments, were relevant to the sanctuary's mission. As such, the MMBD WG developed four strategies to address these concerns. The strategies identified in this document are the result of the MMBD WG discussions and consist of the following:

- Establish Protocols for Vessels in the Vicinity of Whales
- Establish Protocols for Aircraft Overflight in the Vicinity of Whales
- Establish Protocols for Noise Disturbance in the Vicinity of Whales
- Establish Protocols for Fishing Activities in the Vicinity of Whales

Goal Statement

The goal of this MMBD WG is to devise a framework to assess and minimize behavioral disturbance to marine mammals, and to foster cooperation with cross-jurisdictional partners which affect those living marine resources.

STRATEGY MMBD.1 – ESTABLISH PROTOCOLS FOR VESSELS IN THE VICINITY OF WHALES

Introduction and Evaluation of the Vessels in the Vicinity of Whales

For more than 25 years, Stellwagen Bank has been the primary destination for whale watchers departing from Massachusetts; the area is consistently rated as one of the top ten places for whale watching in the world. As a result of its significance to whales, Stellwagen Bank was designated as a National Marine Sanctuary (NMS) in 1992. While commercial whale watching in Stellwagen Bank began with only one company departing from Provincetown, MA in 1975, there are currently more than 15 companies operating more than 20 boats departing from April through November.

The benefits derived from commercial whale watching are both scientific and economic. A 2000 literature review found 62 scientific papers were generated from studies performed opportunistically aboard commercial whale watching vessels (Robbins, 2000). The economic

significance is substantial. In Massachusetts alone, whale watching employs approximately 750 people in 9 communities, generating more than $24 million a year in ticket sales (Hoyt, 2001). These numbers, resulting from the sale of whale watch tickets, do not take into account the various service industries that benefit from the huge influx of tourists such as hotels, restaurants, local vendors and transportation providers.

However, as whale watching grows in popularity around the world there is increasing concern regarding the short-and long-term impacts on the targeted whale populations. Impact studies have shown: changes in ventilation rate (Baker, 1988); avoidance behavior (Donovan, 1986); changes in habitat use (Corkeron, 1995); and abandonment of key habitat (Glockner-Ferrari and Ferrari, 1990). The concerns may be further compounded by the increase in popularity of whale watching, not just commercially, but also recreationally.

In an attempt to minimize the impacts of commercial whale watching, the National Oceanic and Atmospheric Administration (NOAA) Fisheries first established regional guidelines in the Northeast in 1985. These guidelines remained in effect until 1999 when, as a result of two potentially fatal collisions of whales from commercial whale watching vessels (in 1998), the NOAA Fisheries (Northeast Region) convened a Whale Watch Advisory Group (WWAG) to discuss the impact of whale watching on whales within the Gulf of Maine (GOM) and to review the effectiveness of current guidelines. The WWAG was comprised of commercial enterprises, conservation, animal welfare groups, NOAA Fisheries, scientists and the sanctuary. Recommendations included reduced speeds when in sight of whales, and limits on the number of vessels within 183 meters (600 feet) of whales. A recent study conducted on a vessel's and distance from whales pursuant to the guidelines indicated that compliance by commercial whale watch vessels was low (Wiley and Moller, unpublished data). However, this study did not address whether the guidelines were effective in minimizing behavioral disturbance.

Although outreach to the whale watching industry was a priority, little effort was made to educate private boaters. As a result, the International Wildlife Coalition (IWC) and the SBNMS collaborated on an innovative public education campaign entitled "See A Spout, Watch Out! Responsible Whale Watching" (Appendix MMBD.II). Additionally, the International Fund for Animal Welfare (IFAW) worked with the state of Massachusetts, the Center for Coastal Studies (CCS) and the NOAA Fisheries to develop "Steer Clear," an educational pamphlet distributed to registered boaters throughout Massachusetts.

While the sanctuary has a history of outreach to recreational boaters regarding whale watch guidelines, little information is known regarding the numbers of recreational boats that whale watch and the impacts on the targeted animals, or the impact (other than a strike) of any vessel in the vicinity of whales. As such, it is important to balance economic needs with conservation and the following recommendations are offered.

Strategy Summary

Public scoping identified particular concern that whale watch activities may result in undue disturbance to marine mammals. Specific concerns from the public scoping process to be answered include:

1. Are whale watch approach guidelines (which includes commercial, whale watch, and recreational vessels) sufficient to protect marine mammals from harassment or are regulations necessary?
2. Should whale watch approach guidelines / regulations for private recreational boaters to reduce risk of harassment be different?
3. Should personal watercraft (such as "jet skis" and kayaks) be allowed in the sanctuary?
4. What level of behavioral disturbance is currently known to exist?
5. Could a whale watch certification program assist in decreasing behavioral disturbance?
6. Do cumulative whale watch activities increase noise pollution and amplify approach issues to unacceptable levels?
7. What research could inform decision-making and management?
8. How are other agencies or groups addressing the issues in a regional context and under what authority?
9. How can enforcement measures be ensured?

Evaluation of Existing Regulations

- NOAA Fisheries Whale Watch Guidelines – Northeast Region (See Appendix MMBD.III)

Activities (4)

The sanctuary will work in partnership with various agencies and organizations involved with whale watch vessels to implement the following strategies and activities. *Suggested personnel, inter-program relationships, suggested implementation and costs, enforcement considerations, suggested performance measures to assure effectiveness of management plan to be considered.*

(1.1) *Development of regulations governing the operation of vessels in the vicinity of whales, porpoises, and dolphins.*

Based on past incidents in which whale watch vessels and private boaters have struck whales, and on complaints that the behavior of vessels appeared to disrupt patterns of normal behavior (e.g., separating mothers from dependent calves, preventing whales from surfacing in "bubble clouds" made during foraging bouts, etc.), NOAA Fisheries issued guidelines for whale watching. It is considering codifying guidelines into regulations. Because animals within the SBNMS are the focus of both commercial and recreational whale watching, the WG discussed the need to implement regulations independent of the NOAA Fisheries process because the sanctuary was created, largely, to safeguard its historic importance as a feeding area for endangered whales.

Actions:

1.1.1.a SBNMS should draft regulations based on the currently existing NOAA Fisheries (Northeast Region: 100 feet) guidelines applicable to all vessels* in the vicinity of whales (with existing exceptions applicable for commercial fishing vessels engaged in fishing** or authorized vessels investigating entanglements). Unlike guidelines, regulations are legally enforceable. Regulations should be reviewed and modified as necessary based on the results of proposed research (see Activity 1.4 - Research).

Rationale: While members of the WG agreed that regulations should be based on scientific research there was concern expressed regarding the inability to enforce current guidelines. Therefore, members of the WG recommend codifying the current guidelines until research is completed.

**Use the U.S Coast Guard (USCG) definition of vessel to assure inclusion of personal water craft and kayaks. [USCG Rule 3 (a) states: the word "vessel" includes every description of water craft, including non-displacement craft and seaplanes, used or capable of being used as a means of transportation on water."*

***Use the USCG definition of a "vessel engaged in fishing" to ensure that only vessels restricted in their maneuverability are exempted. [USCG Rule 3 (d) states: the word "vessel engaged in fishing" means any vessel fishing with nets, lines, trawls, or other fishing apparatus which restricts maneuverability, but does not include a vessel fishing with trolling lines or other fishing apparatus which do not restrict maneuverability.*

1.1.1.b The sanctuary should not codify the existing NOAA Fisheries guidelines.

Rationale: The question of whether the existing whale watch guidelines are effective in minimizing behavioral disturbance has not yet been answered and in fact cannot be determined until the appropriate research is done. Therefore, members of the WG recommend that a comprehensive research plan be created and implemented for the purpose of reviewing the effectiveness of the whale watch guidelines that can then be amended or codified subsequent to relevant findings.

Regulations should be based on scientific research. A dire need to place regulations before research has not been demonstrated and it is believed that to do so would render any premature regulation vulnerable to legal scrutiny. Additionally, an effective enforcement component has not been present in the past and therefore the existing guidelines cannot be judged on the criteria of not having been enforced. An effective enforcement component is imperative to ensure the long term success of either guidelines or regulations.

1.1.2 Prohibit the use of motorized personal water craft (PWC) in SBNMS.

Rationale: Because of the distance from shore, PWC use in the sanctuary has not been a concern to date; however, there is a concern regarding these craft based on good evidence that such craft have caused abandonment of habitat by humpback whales in Hawaii (Glockner-Ferrari and Ferrari, 1990). PWC craft (such as jet skis), therefore, pose a risk of disrupting whale behavior. The SBNMS should prohibit their use in the sanctuary

both as a matter of human safety and to prevent disruption or injury of whales. The Monterey Bay National Marine Sanctuary (MBNMS) defines personal water craft as: motorized personal water craft (MPWC) to include vessels up to fifteen feet.

1.1.3 Review the use and effects of kayaks in SBNMS, in the vicinity of whales, for human safety considerations and their potential effects on marine mammal behavior.

Rationale: Operations already exist that offer to transport kayakers to Stellwagen Bank to watch whales. Because of the extremely limited visibility from such a low platform and the limited maneuverability of kayaks in the hands of amateurs, a personal safety issue exists for kayakers in the vicinity of whales. The SBNMS may wish to consider restricting or prohibiting the use of kayaks within its boundaries as an issue of personal safety.

1.1.4 Investigate feasibility of a two-tiered regulatory program, such that certified vessel operators would be permitted to approach whales as provided for under any new SBNMS regulations (100 feet) but non-certified vessel operators would be required to comply with NOAA Fisheries personal water craft guidelines (up to 300 feet) (see Appendix MMBD.IV).

1.1.4.a: As an alternative proposal to the action outlined in 1.1.4 above, the sanctuary would implement a two-tiered regulatory program to regulate the distance of approach to whales. Under this type of system, all boat operators (commercial and recreational) would be able to attend a short "safe whale watching" course that would review the regulations, provide information on whale species and common behaviors, and instruct them on safe boating around whales and the consequences of heedless conduct. Once they had attended, they would be allowed closer access (100 feet) to whales than boaters who did not possess a certificate (300 feet).

This effort would ensure that only those operators who were familiarized with whale behavior and risk averse vessel operation could get close to whales (100 feet). Under the current systems of guidelines, ANY boater is allowed to approach within 100 feet. This means that ill-informed boaters may inadvertently enter bubble clouds of feeding whales or make risky approaches that would be prevented if they were forced to remain 300 feet away from whales, as would be the case if they lacked a certification in a two-tiered regulatory system.

1.1.4.b: Because SBNMS has over 840 square miles in it, it a very difficult and expensive area to police. The certifying of boat operators

would be very time consuming and expensive. Many programs in this country are pushing for education rather than regulations.

Observations over the past 30 plus years of fishing and watching the whales shows that education is the best and most practicable way of protecting the whales. We have a great untapped resource that should be used. Whale protection can be taught in schools, youth groups can assist with outreach programs such as Boy Scouts, Girl Scouts; many high schools students have community service programs that can assist. Other methods to increase visibility include placing signs at marinas, launching ramps and boat clubs. The USCG Auxiliary and other boating courses can use handouts.

(1.2) *Enforcement*

The MMBD WG believes that an increased presence on the water is needed to monitor compliance with guidelines and/or to enforce potential future regulations, particularly during high use periods.

Actions:

1.2.1 Mandate regular sanctuary presence on Stellwagen Bank

Rationale: 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., a 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 enforcement, research, marine mammal disentanglement and stand-by, and education and outreach.

1.2.2 Develop a mechanism to notify vessels when in non-compliance of whale watch guidelines or have violated potential regulations.

(1.3) *Outreach and education*

Efforts to regulate vessel conduct around whales, and the ancillary need of enforcement require an aggressive community outreach program to make boaters aware of regulations, rationale and penalties for inappropriate conduct.

Actions:

1.3.1 Provide a sanctuary accreditation program for commercial whale watching operations to promote responsible whale watching.

Rationale: The SBNMS should offer an annual voluntary accreditation course to captains of whale watching companies that would review the regulations, provide information on whale species and common behaviors, and allow an opportunity to share information regarding safe boating around whales and the consequences of heedless conduct. Attendance at

this course would result in issuance of a certificate that could be advertised by the whale watching company. Additionally, companies with captains who had completed the course could be "starred" in the SBNMS listing of all whale watching companies. The intent is to provide incentive for potential customers to choose a whale watching company whose captains had demonstrated a greater interest in risk averse whale watching.

**This program could be a template as an incentive program for all boaters.*

1.3.2 Assess current boater outreach programs with continued support for effective programs where appropriate. Develop supplemental materials as needed. Sanctuary should actively seek funding partnerships.

Rationale: Due to the aggregation of wildlife within the sanctuary there are increased interactions between whales and boats. As a result, the risk of harassment and vessel collisions with whales increases.

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. For example, the IFAW, working with the NOAA Fisheries, the Massachusetts State Department and the CCS, developed "Steer Clear," a brochure sent to boaters registered in Massachusetts. Additionally, the IWC, 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.

1.3.3 Convene a biennial or annual conference prior to the whale watch season (March to April) for educators, naturalists, and citizens at large to learn about SBNMS resources, research, conservation, and regulations. Provide Professional Development Points (PDPs) and education materials to be used in classrooms, whale watching vessels, and in continuing education units.

(1.4) *Research*

Research will enhance our understanding of the use of the sanctuary by both vessels and whales in order to inform future protective efforts. Additionally, information on short- and long-term impacts of vessels and associated noise on whales is needed (see Strategy MMBD.3 – Establish Protocols for Noise Disturbance in the Vicinity of Whales).

Actions:

1.4.1 Keep track of how many whale watching vessels (recreational and commercial) are using the sanctuary to track trends in commercial whale

watching activity over time. Additionally, continue trackline survey studies to monitor distribution of whales and vessels in the sanctuary spatially and temporally.

1.4.2 Encourage species recognition and individual ID studies which provide an opportunity to determine long-term impacts.

Rationale: The ability to identify individual animals is an important aspect of wildlife studies. Individual identification can give researchers information regarding population size, life span, social structure, reproductive capabilities, migratory patterns and behavioral ecology. Studies of individuals can also help determine if there are differences in the behaviors or habitat utilization between animals. For example, ID studies may provide data with which to determine whether whales that frequent the sanctuary are more habituated to boat traffic than those that tend to use other GOM areas.

There is a long history of individual identification of large whales that visit the greater sanctuary area, first beginning in the late 1970s and continuing through today. For the past several years the sanctuary has helped to sponsor the annual Humpback Whale Naming Workshop that catalogues newly sighted whales that are primarily photographed within the sanctuary.

1.4.3 Encourage partner institutions to strongly consider how existing data and shared scientific interests might be applied to the understanding of whale watching impact.

1.4.4.a Investigate research strategies to determine short-term and cumulative impacts of human activities on whales including but not limited to assessing harassment and disruption of marine mammals and to better define approach regulations.

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 are good precautionary reasons for the sanctuary to codify existing NOAA Fisheries guidelines into regulations within the sanctuary, the group recognized that regulations would be far more defensible if they were based upon research specifically directed at this issue. Accordingly,

the group recommends that such studies be conducted in the near future, and that the results of those studies be used to modify sanctuary (and potentially NOAA Fisheries) policy regarding whale watching regulations. (See Exhibit MMBD.I – Vessel Approach Studies for a detailed list of potential research study elements).

1.4.4.b Investigate non-invasive tagging programs.

Rationale: Photo-ID produces valuable but sporadic data on the behavior of individuals, such as their distribution and habitat use patterns. By contrast, tagging has the potential to provide a more continuous record of behavior. This can be useful when interested in determining the amount of time spent in an area or when studying short term responses to stimuli. Advances in this regard include the potential for data collection on body position/attitude, surfacing and ventilation patterns and physiological responses.

Any tagging program within the sanctuary must strongly consider the potential impact of tagging itself, including the tagging process. Furthermore, this may not be the most effective method of determining cumulative impacts in a population with over two decades of prior exposure.

STRATEGY MMBD.2 – AIRCRAFT OVERFLIGHT IN THE VICINITY OF WHALES

Introduction and Evaluation of the Overflight Issue

Overflight Research

Research (Richardson, et al., 1995; Patenaude, et al., 2002) demonstrates that the level and frequency of aircraft sounds propagating in water are strongly affected by water depth and bottom conditions. Lateral propagation is better in shallow water than in deep water. Many reflected paths are possible in shallow water. As a result, the time during which an airborne source passing overhead can be received underwater is lengthened in shallow water by multiple reflections.

The angle at which a line from the aircraft to the receiver intersects the water's surface is important. At angle >13 degrees from the vertical, much of the incident sound is reflected and does not penetrate into the water (Richardson et al., 1995). This is especially true with calm seas, deep water, or shallow water with a non-reflective bottom. The lateral distance at which aircraft noise becomes undetectable varies with local ambient noise conditions, water depth and bottom reflectivity, but is generally brief in duration, especially when compared with the duration of audibility in air.

The auditory systems of baleen whales are assumed to be sensitive to low-frequency underwater sounds, based on the predominantly low frequency of their calls, their auditory anatomy, and

their observed reactions to various low frequency sounds (Ketten, 2000). In contrast, dolphins have insensitive underwater hearing below 1 kHz but acute hearing at frequencies > 10 kHz. For either aircraft flying directly overhead or at an altitude of 160 meters, they received levels of low-frequency tones 18 meters below the surface which were well below auditory thresholds and corresponding frequencies, and presumably inaudible.

Helicopter Disturbance

Patenaude et al. (2002) (e.g., studies on bowheads and belugas in Alaska) show that the level of sound from any type of aircraft depends on receiver depth and the altitude, aspect, and strength of the noise source. Observation showed that single straight-line helicopter overflights can briefly affect the behavior of some bowhead whales at altitudes < 150 meters, although these may not be biologically significant. It is more likely that circling or prolonged hovering at low altitude would more likely cause important disturbance effects.

Fixed-Wing Aircraft Disturbance

Reactions to turbine-powered fixed-wing aircraft (Twin Otter) were less pronounced than those to a helicopter, possibly because of the weaker and less complex sound. The most common reaction was an unusually short surfacing, but there were also instances of abrupt dives and of turning or heading away. Reaction frequency diminished with increasing lateral distance and with increasing altitude (Patenaude et al., 2002).

When dealing with aircraft sound, an altitude of 300 meters is the usual reference distance for in-air measurements and predictions, and the same convention is appropriate for underwater sound from aircraft. It is impossible to isolate the concepts of source level and propagation loss when considering underwater noise from aircraft.

Airship Disturbance

Airships have been utilized as research platforms to study whales in many areas, including the SBNMS. The impacts on whales from this type of aircraft are not known. However, anecdotal evidence suggests that shadows from airships may disturb whales (Carlson, personal communication, 2004). Additionally, Nowacek et al. (2001) found momentary (<10s) avoidance behavior exhibited by dolphins due to the shadow of an airship. It is important to note that these behaviors did not occur consistently.

Strategy Summary

Public scoping identified particular concern that SBNMS's lack of overflight restrictions may result in undue disturbance to marine mammals. Currently, SBNMS has no overflight restrictions and no studies on aircraft disturbance have been conducted in the SBNMS region. Specific concerns from public scoping process to be answered include:

1. Does overflight by aircraft disturb marine mammals while resting, feeding or during social interactions (e.g., tuna spotter planes)?

2. Should there be restrictions on low flying aircraft?

3. How are NOAA Sanctuaries and other agencies addressing the issues in a regional context and under what authority?

Evaluation of Existing Regulations Addressing Overflight in Vicinity of Whales

- SBNMS Regulations
  None to date.

- Federal Aviation Administration (FAA) Regulations (Appendix MMBD.V)
  The existing regulations are the FAA general operating and flight rules (Title 14, Part 91, Sec. 91.119 c) stating:

  (c) "over other than congested areas. An altitude of 500 feet above the surface, except over open water or sparsely populated areas. In these cases, the aircraft may not be operated closer than 500 feet to any person, vehicle, or structure.

  (d) Helicopters. Helicopters may be operated at less than the minimums prescribed in paragraph (b) or (c) of this section if the operation is conducted without hazard to persons or property on the surface. In addition, each person operating a helicopter shall comply with any routes or altitudes specifically prescribed for helicopters by the Administrator.

- NOAA Fisheries Whale Watch Guidelines – Northeast Region (Appendix MMBD.III)

- National Marine Sanctuary Program (Appendix MMBD.VI)
  There are overflight regulations in the following national marine sanctuaries: GFNMS, MBNMS, Hawaiian Islands Humpback Whale Sanctuary, and Olympic Coast NMS.

- National and International Guidelines and Regulations as Applies to Whale and Dolphin Watching (Appendix MMBD.VII)

Activities (3)
The sanctuary will work in partnership with various agencies and organizations involved with overflight craft to implement the following strategies and activities. *Suggested personnel, inter-program relationships, suggested implementation and costs, enforcement considerations, suggested performance measures to assure effectiveness of management plan to be considered.*

(2.1) *Develop outreach advisories.*
There are currently no site-specific overflight regulations in SBNMS. Currently published NOAA Fisheries Northeast Regional Guidelines on approach to marine mammals cover both vessels and aircraft (See Appendix MMBD.III). These approach guidelines stipulate that "aircraft should observe the FAA minimum altitude of 1,000 feet over water." Note that there is inconsistency with FAA regulations which NMFS will address. Additionally, the Code of Federal Regulations {50CFR.224.103.(c)}for North Atlantic right whales prohibit "approach (including by interception) within 500 yards (460 meters) of a right whale by vessel, aircraft, or any other means (Appendix MMBD.VIII). These guidelines are not reflected in FAA publications.

The MMBD WG recognized the need to minimize the potential disturbance from overflight activity, as well as inform the aviation community regarding overflight in proximity to whales.

Actions:

2.1.1 Work with pilot associations to include SBNMS notation and current NOAA Fisheries Northeast Region overflight guidelines on aeronautical charts and information materials.

2.1.2 Develop a cross-jurisdictional monitoring program for overflight activities.

(2.2) *Develop an overflight schema.*

Actions:

2.2.1.a Create sanctuary regulations, to govern the operation of airplanes, helicopters, airships, and other aircraft in the presence of marine mammals to state:

"Helicopters, airships, and other aircraft should not be operated lower than an altitude of 1000 feet, except where more restrictive regulations apply and for other approved activities in SBNMS, or where scientific research permits are granted by NOAA Fisheries."

Rationale: Based on research regarding potential disturbance of marine mammals by overflight activity, and the existence of overflight regulations in other sanctuaries, the behavioral disturbance WG felt the need to address this issue within the SBNMS regarding overflight activity.

2.2.1.b Do not create sanctuary regulations to govern the operation of airplanes, helicopters, airships, and other aircraft in the presence of marine mammals

Rationale: While the need of overflight guidelines is acknowledged, with respect to regulations, it is believed that more research is required in order to determine a minimum recommended altitude that would minimize or eliminate behavioral disturbance.

2.2.2 SBNMS should recommend that NOAA National Ocean Service (NOS) ask NOAA Fisheries to approach the FAA to change FAA regulations. 91.119 (c) to delete the word "or" following the word "vehicle" and insert "and marine mammals, except where more restrictive regulations prevail."

(2.3) *Identify information gaps.*

The MMBD WG recognized the need to gather additional data on overflight activities to understand the potential disturbance of marine mammals.

Actions:

2.3.1 Produce descriptive database to determine overflight use including planes, helicopters, blimps and other aircraft.

2.3.2 Recommend and support research to evaluate the impacts of noise, visual, and tactile stimuli.

2.3.3 Request NOAA Fisheries (Northeast Region) to look at inaccuracy of its characterization of FAA regulations in its whale watch guidelines.

STRATEGY MMBD.3 – ESTABLISH PROTOCOLS FOR NOISE DISTURBANCE IN THE VICINITY OF WHALES

Introduction and Evaluation of the Noise Disturbance Issue

Noise levels in the ocean are estimated to be doubling per decade (Anderson, et al., 1971; Ross, 1987; Andrew, et al., 2002; NRC, 2003). Although chronic and acute noise impacts are well studied in terrestrial animals for experimental work, relatively little is known about how aquatic organisms may be impacted by noise. Exposure to anthropogenic noise has the potential to impact cetaceans by masking biologically important sounds (such as communication), provoking avoidance (or attraction), causing temporary or permanent hearing damage and, in extreme cases, even death (Yost, 1994; Richardson, et al., 1995). Unfortunately, specific data with which to assess exposure and impact are presently limited and potentially difficult to obtain. While the gross anatomy of the marine mammal ear is similar to that of terrestrial mammals in some ways, marine mammal hearing abilities are very different and distinct form most land mammals. For many marine mammals, their total hearing capacity is simply not known. Furthermore, we remain limited in our ability to detect and correctly interpret animal responses to such stimuli. Nevertheless, marine mammals have been shown to manifest behavioral changes in the presence of certain types of noise (Erbe C., 2002; Frankel and Clark, 2002; Patenaude, et al., 2002; Richardson and Wursig, 1997). In at least three cases, military sonar exercises have been suspected to precipitate mass strandings, based on the timing of the events and the nature of the injuries observed (Active Sonar Workshop, 17th ECS Conference, March 2003).

There is presently no clear evidence for or against noise-related impacts to cetaceans in the SBNMS. However, given the potential for serious impact, it is appropriate for the sanctuary to carefully investigate this issue within its boundaries. It should be noted that impacts can occur to animals within SBNMS from high level sources outside the sanctuary. Therefore, we most consider all potential noise effects regardless of origins.

Commercial, recreational, military, and research vessels all contribute to ambient marine noise in the sanctuary, whether directly through their marine operations (e.g., engines, props, and electronics) or indirectly, through the activities that they perform such as probes and dredging. Some, like private and commercial whale watching vessels, specifically target cetaceans. Due to their routine approaches and close proximity, the potential acoustic impacts of such vessels may be a source of chronic exposure. Fishing vessels regularly overlap with cetaceans in the sanctuary and so their presence and activities may also be a source of acoustic disturbance.

Cetaceans are also known to aggregate in and near the shipping channel and their long-term acoustic exposure to traffic may have a corresponding and potentially serious chronic exposure impact. Finally, there may be important sources of noise that have yet to be identified.

Strategy Summary

This strategy addresses issues of disturbance to whales caused by in-water anthropogenic noise. This includes: shipping, ecotourism, military, research and private vessels. The goal of this strategy is to provide a framework to assess and mitigate anthropogenic noise occurring at levels where behavioral disturbance is clearly evident.

Public scoping identified particular concerns regarding impacts of vessel noise and other acoustics on marine mammals. Currently, SBNMS has no noise guidelines or regulations. The concerns from public scoping to be answered include:

Whale Watching Activity

1. Do cumulative whale watch activities increase noise pollution and amplify approach issues to unacceptable levels?
2. What research could inform decision-making and management?
3. How are other agencies or groups addressing the issues in a regional context and under what authority?
4. How can enforcement measures be ensured?

Impacts of Vessel Noise and Other Acoustics on Marine Mammals

1. What are the sources of noise pollution? What are the levels of noise pollution?
2. What are the deleterious effects of noise pollution on marine mammals (e.g., masking, etc)?
3. Should action be taken to mitigate noise pollution effects on marine mammals within sanctuary boundaries?
4. What research could inform decision-making and management?

Evaluation of Existing Regulations Addressing this Issue

- NOAA Fisheries Whale Watch Guidelines – Northeast Region (See Appendix MMBD.III)

Activities (2)

The sanctuary will work in partnership with various agencies and organizations involved with noise disturbance to implement the following strategies and activities. *Suggested personnel, inter-program relationships, suggested implementation and costs, enforcement considerations, suggested performance measures to assure effectiveness of management plan to be considered.*

(3.1) *Marine Noise Consortium*

Actions:

3.1.1 The group recommends that the sanctuary sponsor a consortium to examine and promulgate research on noise in and around the sanctuary and its effects on marine life.

Recognizing the need for independent, targeted research and maintaining scientific integrity of those datasets, members of the SBNMS Noise Consortium would agree to partner with the sanctuary and make raw data available through the established data-use policy.

(3.2) *Development of research recommendations.*

Actions:

3.2.1 Baseline sampling to establish and evaluate variation in the background noise levels from activities within or propagating into the sanctuary.

3.2.2 Placing and monitoring a hydrophone array and maintaining the resulting data set would address three critical needs:

1. Determine current noise levels.

2. Monitor and document long-term the noise budget within the sanctuary.

3. Provide a record of noise levels coincident with critical events such as ship strikes and strandings.

Rationale: Little data exist with which to evaluate variations in background noise levels and patterns of sound propagation in the SBNMS. Such information is critical to assessing the present and future risk of noise to marine life. One approach would be to focus this effort on areas of the sanctuary where whales are known to congregate. Acoustic monitoring could then be accomplished by a variety of mechanisms such as bottom-mounted arrays or "pop-up" buoys. Potential benefits include providing information on seasonal variations, spatial variations, and diurnal variations. These would serve as a valuable record for retrospective analyses. One desirable possible outcome would be the construction of a 3-D noise propagation model for those sites within the sanctuary.

Several activities devoted to noise monitoring in and around the SBNMS are planned in the near future (i.e., summer and fall 2004). These represent preliminary projects consistent with the consortium concept and will allow us to test the feasibility of building a database.

3.2.3 Collect data with which to evaluate the potential impact of specific noise sources, such as specific vessel types or activities.

3.2.4 Identify entities conducting relevant acoustic research and initiate partnerships as appropriate.

3.2.5 Investigate a non-invasive tagging program to evaluate the potential for acoustic exposure and animal responses to acoustic stimuli.

Rationale: Advances in suction cup tag technology, like the Digital Tag (DTAG) (Woods Hole Oceanographic Institute), allow sound levels to be recorded at the whale and include both received sounds and those made by the whale. Furthermore, modern tagging technology allows for sensitive measurement of behavioral and physiological responses (such as heart rate). Such data can greatly enhance understanding of animal detection and responses to specific stimuli. However, any tagging program within the sanctuary program must take into consideration that the tagging process itself may be a source of behavioral disturbance for the individuals under investigation.

STRATEGY BD.4 – ESTABLISH PROTOCOLS FOR FISHING ACTIVITIES IN THE VICINITY OF WHALES

Introduction and Evaluation of the Fishing Activity Issue

The potential for competition between fisheries and marine mammals is an issue which extends outside the purview of the sanctuary. This is an immensely complex and controversial topic which has generated much debate in the realms of both science and politics; among other things, it is currently the basis for many of the arguments over scientific whaling by Japan, Norway and Iceland. Addressing the question of whether fisheries exploitation impacts whales (by removing their food) or, conversely, whether consumption by whales of commercially valuable prey species negatively impacts fisheries, is extremely difficult. Scientific approaches to this issue involve complex ecosystem modeling whose input parameters and conceptual frameworks are both highly debatable, and there is unlikely to be any resolution of this problem in the foreseeable future. Thus, fishery-cetacean competition is a broad issue which clearly lies outside the realm of the sanctuary (among other things because the ecosystem within the sanctuary cannot be considered separate from the broader marine system of the GOM and beyond).

Furthermore, there is currently no evidence that fishery takes within the sanctuary are of sufficient magnitude to impact the prey base of the marine mammals found there, although it must be acknowledged that no research has been conducted on this topic. Sand lance (*Ammodytes* spp.) appear to be the primary prey of large whales in this region at the present time, and there is currently no fishery for this species here or elsewhere.

The WG acknowledged, however, that should intensive fishery effort for small finfish (including sand lance, herring [*Clupea harengus*] and potentially other species) be proposed within the sanctuary in the future, the sanctuary should consider the question of whether the proposed catches would be of sufficient size to significantly deplete the marine mammal prey base in the area. Research to estimate the abundance of prey species, and to assess the potential energetic requirements of whales, would be required, as well as more challenging studies of the potential ecosystem impact of large catches of fish species. It was recommended that sanctuary staff should immediately enquire with NOAA Fisheries personnel regarding the likelihood that such intensive fishing effort would occur within the sanctuary in the near future.

Currently, there are no regulations on tuna spotter planes, but tuna fisherman have stated that they target whales and whale watching boats because of the possible presence of sand lance. The impacts of tuna spotter planes on marine mammal disturbance has not been studied in the sanctuary. Tuna spotter planes sometimes target concentrations of humpback whales (because of their association with tuna, which presumably feed upon similar prey). However, whales do not appear to be disturbed by these activities (Phil Clapham, personal communication 2004). Typically, tuna spotters do not target specific individual whales and do not engage in the low-altitude, prolonged circling over whales that has been identified as a possible source of disturbance (i.e., from small planes engaged in whale watching). Many commercial fishing boats transit the bank to and from fishing grounds within, and beyond, the sanctuary. Because they are readily able to maneuver, these vessels should be considered to be power driven vessels (per USCG Rule 3(b)*) and be subjected to the same regulations of other vessels in the vicinity of whales. Furthermore, tuna boats trolling lines through concentrations of whales are likely to disturb whales that may be feeding or nursing, and instances have been reported of tuna hooks becoming embedded in whales. Although these issues are not likely to represent a major problem for whales (and would be considered low priority relative to more pressing issues such as entanglement and vessel collisions), there is a risk of disturbance or collision if recreational and/or commercial fishing vessels transit through concentrations of whales in pursuit of fish.

**In the International Navigation Rules, according to USCG Rule 3 (d), the word "vessel engaged in fishing" means "any vessel fishing with nets, lines, trawls, or other fishing apparatus which restricts maneuverability, but does not include a vessel fishing with trolling lines or other fishing apparatus which do not restrict maneuverability". Therefore, vessels that are underway and are not restricted in their maneuverability are power driven vessels and must abide by all rules applicable to power driven vessels.*

Strategy Summary

Public scoping identified particular concern that fishing activities may result in undue disturbance to marine mammals. Specific concerns from the public scoping process to be answered include:

1. Large midwater trawlers are competing with marine mammals for food and they fish in close proximity to marine mammals.

2. Tuna fishermen often target areas where marine life, including whales, are present. These

fishermen often transit close to whales with little regard for them, and several observers have seen numerous close calls.

3. Fishing for herring should be outlawed.

Activities (1)

(4.1) *Outreach and education*
The WG SBNMS should include recreational and commercial fishing vessels in the development of education materials regarding precautionary operation of vessels around whales.

Actions:

4.1.1 Target recreational and commercial fishing vessels in the development of educational and outreach materials for responsible operation in the vicinity of whales.

EXHIBITS
(MARINE MAMMAL BEHAVIORAL DISTURBANCE)

EXHIBIT MMBD.I – Vessel Approach Studies

Studies to assess the effect on whales of directed vessel approaches would potentially include the following elements:

- A control period during which whales are observed undisturbed by any vessel; this could be conducted either from a station on shore (in a location where whales are sufficiently close to land) or from a vessel that is dead in the water.
- Following the control period, directed approaches could be conducted by one or more vessels at a variety of speeds and distances.
- Response of whales to specific acoustic stimuli (such as vessel noise) could also be assessed via playback studies.
- Following an appropriate control period, opportunistic observations could also be made of responses of whales to actual approaches by whale-watching or private vessels, although a reliable method of distance estimation would have to be included in this protocol.
- Whales could be tagged with suction-cup digital tags that record sound and monitor the exact movements of the tagged animal in space. This technique has been used successfully with right whales in conjunction with playback experiments to assess the whales' reactions to vessel approaches, alarm signals and other stimuli (Nowacek et al., 2002; 2003), and would be very useful here.
- Variables to be measured during the control and exposure periods would include (but not necessarily be limited to): respiration rate, dive time, movement and behavior.
- The study would need to target enough animals (of both sexes and all age classes) and conduct enough trials on each animal to provide a statistically robust sample that allowed for significance to be assessed (i.e., beyond normal variation).
- Significant changes in any of the measured variables in response to controlled approaches or playbacks, or to actual approaches by other vessels, would potentially be considered as disruptive. However, interpretation of such data, and determination of the biological significance of impacts, would require further discussion within the scientific community.
- It is essential that any study of this nature be submitted for publication in a peer-reviewed journal, and also be reviewed by other scientists prior to acceptance as a basis for establishing any regulations.

EXHIBIT MMBD.II – National Defense Authorization Act

National Defense Authorization Act
Section 319: Military Readiness and Marine Mammal Protection
"We put the sailor ahead of the sea lion."
- Rep. Duncan Hunter (R-CA)

The FY 2004 Defense Authorization Act (H.R. 1588) includes language that amends the definition of "harassment" under the Marine Mammal Protection Act (MMPA) to provide the military with greater leeway to conduct activities that might affect marine mammals, such as the use of submarine tracking sonar. The definition was amended largely in response to the Pentagon's claim that restrictions intended to protect marine mammals under the MMPA were unduly compromising national security by interfering with military readiness activities. Under the new definition, which was signed into law by President Bush on November 24, 2003, for "military readiness activities or a scientific research activity conducted by or on behalf of the Federal government," the term "harassment" means an action that injures or has the *significant potential* to injure a marine mammal or marine mammal stock in the wild; ordisturbs or is *likely* to disturb a marine mammal or marine mammal stock in the wild by causing disruption of natural behavioral patterns, including, but not limited to, migration, surfacing, nursing, breeding, feeding, or sheltering, to a point where such behavioral patterns are abandoned or significantly altered. [emphasis added]

This language differs from the MMPA's existing definition of harassment, which applies a higher standard to non-military and non-government research activities by requiring a permit if the proposed activities have the "potential to injure" or "potential to disturb." In other words, under the new definition, it may be easier for military and scientific research activities conducted on behalf of the federal government to proceed without authorization from NOAA Fisheries. From a conservation standpoint, the threshold for actions that require a permit is now lowered to those that have the "*significant potential* to injure" or are "*likely* to disturb."

The bill also changes the section of the MMPA dealing with exceptions and would allow "incidental takes" of marine mammals in "military readiness activities" during a five-year period as long as it will have a "negligible impact upon such species." Under the MMPA, the term "take" means to harass, hunt, capture, or kill, or attempt to harass, hunt, capture, or kill any marine mammal. This exemption would be similar to one given to the commercial fishing industry.

Further, the bill adds a national security exemption to the MMPA, which allows U.S. Department of Defense (DOD) to get a two-year exemption from compliance with the Act for any action or category of actions if the Secretary of Defense determines "that it is necessary for national defense."

APPENDICES
(MARINE MAMMAL BEHAVIORAL DISTURBANCE)

APPENDIX MMBD.I – Emerging Issues

The WG identified a number of issues that may need to be addressed in the future, either because there is a potential increase in current activity in the sanctuary or because activity does not currently occur, but may be proposed for the future. Research and management decisions regarding these issues should consider those currently proposed in the MMBD Action Plan.

- *Military Vessels:* Military activities occur within the sanctuary and with concerns about homeland security, traffic may increase. These operations present risk of collision or disruption of behavior. We assume that collision risk is being addressed by other WGs, but if not, we recommend that the SBNMS coordinate with NOAA Fisheries to document use of the sanctuary and consult with the DOD if necessary.

- *DOD Activities:* Military planes fly over the sanctuary, and with concerns about homeland security, traffic may increase. Due to the recent amendment to the definition of harassment under the MMPA (Section 3), some military activities which might previously have been considered to be harassment may now be exempted. Therefore, we recommend that the SBNMS coordinate with NOAA to document military use of the sanctuary and consult with the DOD if necessary. (See Exhibit MMBD.II National Defense Authorization Act.)

- *High Speed Ferries:* With advancing technology, passenger ferries between Boston, the Massachusetts north shore, and Cape Cod have become faster and more numerous. This increased speed may pose a higher risk of collision or behavioral disruption because both operators and whales have reduced reaction time. We assume that collision risk is being addressed by other WGs, however if not, we recommend that the SBNMS coordinate with NOAA Fisheries to document this use and consider regulation.

- *Marine Construction:* The noise of construction of any sort, including cable laying, installation of structures, laying of pipelines, etc., may pose a risk of behavioral disturbance to whales in the SBNMS. Proposals for construction of pipelines or erecting structures in or around the boundaries of the SBNMS require careful scrutiny to determine potential impacts on animals in the sanctuary.

- *Dive Boats:* As has happened in marine sanctuaries elsewhere, there is the potential for entrepreneurs to offer diving trips to Stellwagen Bank, either for viewing of archaeological sites or marine life. Should this type of operation be proposed, the SBNMS should be aware that it poses a risk of behavioral disruption of animals, and that regulation may be necessary.

- *Ocean Based Energy Generation:* With greater interest in alternative forms of energy generation, developers have begun to look to the ocean for sighting energy generating plants (e.g., wind turbines, wave generating, etc). Because of the high use of sanctuary waters by vessels, and because of the paucity of information on impacts of such facilities

on marine ecosystems, any proposal to construct energy generating facilities in or near the sanctuary should be viewed with great caution.

- *Emerging Fisheries:* With the decline of groundfish stocks and increased research into alternative fishing methodologies, there is the potential for experimental or permitted fisheries that seek to exploit new fishery niches. Some of the technologies may adversely affect marine mammals. The SBNMS should be proactive in its consultation with NOAA Fisheries regarding new proposed fisheries or shift in effort of existing fisheries that may take place within the boundaries of the sanctuary.

- *Parasailing:* As has happened in marine sanctuaries elsewhere, there is the potential for entrepreneurs to offer parasailing trips on Stellwagen Bank. Because tow boats are limited in their maneuverability as they tow an aerial passenger, they may pose a risk of collision or disruption to nearby whales. Should this type of operation be proposed, the SBNMS should be aware that it poses a risk of behavioral disruption of animals, and that regulation may be necessary.

- *Whale Watching Planes:* In a number of national parks, aerial viewing of natural wonders has increased. Should such operations be proposed for SBNMS, operators would need careful scrutiny to assure that whales are not harassed. We note recommendations elsewhere in this report relative to recommended altitudes to avoid harassment.

- *Shadow Effects of Overflight:* Anecdotal evidence suggests that whales are startled, and their behavior disrupted, by shadows of aircraft passing over them. Low altitude use of tuna spotter planes, private aircraft, and airships may cast shadows that disturb animals. We note recommendations elsewhere in this report relative to recommended altitudes to minimize this effect. The MMBD WG recommends that the sanctuary conduct research on the shadow effects of overflight.

- *Tuna Spotter Planes:* Tuna spotter planes sometimes target concentrations of humpback whales (because of their association with tuna, which presumably feed upon similar prey). However whales do not appear to be disturbed by these activities (Phil Clapham, personal communication 2004). Typically, tuna spotters do not target specific individual whales and do not engage in the low-altitude, prolonged circling over whales that has been identified as a possible source of disturbance (i.e., from small planes engaged in whale-watching). Accordingly, it is our recommendation that tuna spotters be exempt from overflight restrictions.

APPENDIX MMBD.II – "See A Spout, Watch Out!"

The International Wildlife Coalition (IWC) advocates whale watching as an educational resource and as an alternative to commercial whaling. We also believe that seeing these amazing animals in their natural environment must be done safely and respectfully. As a responsible boater, we'd like to offer you the following information for a safe and enjoyable look at whales!

Five Tips For Boating Around Whales:

1-See A Spout, Watch Out!

If you see a spout, or a tail, or a breaching whale, please slow down and post a lookout. Some whales dive 20 minutes or more searching for food. If you've seen one whale, many more could be close-maybe too close to your boat and its spinning propellers. Proceed cautiously!

2-Head On Is Wrong!

Don't alter a whale's path by cutting it off. When in sight of a whale, follow official guidelines and adhere to existing regulations that restrict or prohibit closely approaching whales. Always keep your boat a safe distance; don't risk striking a whale. Federal law prohibits the harassment of all marine mammals. Federal NOAA Fisheries regulations and Massachusetts laws prohibit approaching the highly endangered North Atlantic right whale closer than 500 yards.

3-Lots Of Boats, Then Talk To Folks!

If there are other boats watching or traveling near whales, hail them on your VHF radio (channel 9 or 16) and coordinate your viewing efforts.

4-Avoid Trouble, Steer Clear of Bubbles!

Humpback whales sometimes feed by creating what are called "bubble clouds". The whales blow bubbles below the surface of the water to confuse and condense schools of small fish. With mouths wide open, the whales surface through the middle of the bubble cloud engulfing large numbers of dazed fish. Bubble clouds look like light green, foamy patches on the surface of the water. Birds often hover over them to take advantage of the readily available fish. Never approach, or drive through, a bubble cloud as a feeding whale is likely to be just below the surface.

Gulf of Maine Marine Mammal Guide

(graphics and info in the rack card)

5-Don't Chase, Give The Whales Space!

Closely approaching a whale may cause the animal to move away from its food source. Respect the whale's behavior and keep your distance. If a whale moves away, don't chase it. A cautious boater may bet to see whales feeding, playing or breaching. Enjoy the whales; don't endanger them!

Clean and Pristine:

We rely on the ocean for food, fun, and phytoplankton (tiny creatures that provide us with oxygen to breathe) so keeping the marine ecosystem clean and healthy is in our best interest. Here's a few easy things you can do to help ensure a healthy ocean:

Don't Dump, Pump-

Contact with disease causing bacteria found in sewage can lead to human ailments, habitat degradation and shellfish poisoning. Call ahead to the local harbormaster to find a local pump-out station to remove sewage from your vessel. *Dumping untreated sewage within three miles of shore is illegal.*

Put A Sock In It!

Using oil absorbent "socks" and pads in your bilge can prevent oil from leaking out and contaminating the water. Pads should be checked regularly, changed when needed and disposed of properly. Remember that a well-tuned engine runs more efficiently and cleaner.

Stash Your Trash-

Federal laws prohibit dumping any trash overboard within three miles of shore and plastic waste anywhere in the ocean. At least 49 species of marine mammals and 312 types of birds are known to ingest, or become entangled in, marine debris. Marine debris can be fatal. Please do not leave trash on the deck to blow overboard. Bring your trash back to shore and dispose of it properly.

Helpful Hotline Numbers

Observant boaters can be instrumental in helping gather crucial data, such as sightings of the critically endangered North Atlantic right whale, and saving injured animals by reporting them to the appropriate authorities. Please refer to the respective hotline numbers if you see a right whale, find a whale that is injured or stranded, or see a whale entangled in fishing gear. You can make a difference!

To report live right whale sightings call: 978-585-8473
To report stranded or injured whales call: 978-585-7149
To report a whale entangled in fishing gear call the Coast Guard on VHF 16 or call the Center for Coastal Studies at: 800-900-3622
If possible, please standby an entangled whale until a response vessel arrives. If you must depart, please document your sighting with photos or video and report the time, location, and whale's direction of travel when you left.

For more information about this program, or the IWC please call 508.548.8328 or visit our website at www.IWC.org.

NOAA - National Marine Fisheries Service & National Ocean Service

WHALEWATCHING GUIDELINES FOR THE NORTHEAST REGION INCLUDING THE STELLWAGEN BANK NATIONAL MARINE SANCTUARY

All whales, dolphins and porpoises in the northeast region are federally protected by the Marine Mammal Protection Act (MMPA) and most large whales in the area are further protected under the Endangered Species Act (ESA). Under these Acts, it is illegal to "harass, hunt, capture or kill" any marine mammal. Prohibited conduct includes any "negligent or intentional act which results in the disturbing or molesting of marine mammals."

The following operational procedures are intended to avoid harassment and possible injury to large whales, particularly the finbacks, humpbacks and minke whales commonly seen by vessels engaged in whale watching. Following the guidelines can help protect both you and the whale you wish to watch and keep you from accidentally violating federal law.

The right whale is protected by separate State and Federal regulations that prohibit approach within 500 yards of this species. Any vessel finding itself within the 500 yard buffer zone created by a surfacing right whale must depart immediately at a safe slow speed. The only vessels allowed to remain within 500 yards of a right whale are vessels with appropriate research permits, commercial fishing vessels in the act of hauling back or towing gear, or any vessel given prior approval by NMFS to investigate a potential entanglement.

OPERATIONAL GUIDELINES WHEN IN SIGHT OF WHALES:

From two miles to one mile away:
Reduce speed to 13 knots.
Post a dedicated lookout to assist the vessel operator in monitoring the location of all marine mammals.
Avoid sudden changes in speed and direction.
Aircraft observe the FAA minimum altitude of 1,000 feet over water.

From one mile to one-half mile away:
Reduce speed to 10 knots.

From one-half mile to 600 feet away:
Reduce speed to 7 knots.
Maneuver to avoid head-on approach.

Close approach procedure 600 feet or closer:
Parallel the course and speed of moving whales up to the designated speed limit within that distance.
Do not attempt a head-on approach to whales.
Approach and leave stationary whales at no more than idle or "no wake" speed, not to exceed 7 knots.
Do not intentionally drift down on whales.
Vessels in multi-vessel approaches should maintain communication with each other (via VHF channels 9, 13, or 16 for hailing) to coordinate viewing.
Take into account the presence of obstacles (vessels, structures, fishing gear, or the shoreline). All vessels in close approach must stay to the side or behind the whales so they do not box in the whales or cut off their path.

Stand-by Zone -- From 300 feet to 600 feet away:
Two vessel limit within the 300- to 600-foot Stand-by Zone at any one time.

Close Approach Zone -- From 100 feet to 300 feet away:
One vessel limit.
Other vessels stand off. (up to two vessels in the Stand-by Zone – others outside 600 feet).
If more than one vessel is within 600 feet, the vessel within 300 feet should limit its time to 15 minutes in close approach to whales.

No Intentional Approach within 100 feet.
Do not approach within 100 feet of whales. If whales approach within 100 feet of your vessel, put engines in neutral and do not re-engage propulsion until whales are observed clear of harm's way from your vessel.

Departure Procedure
All vessels should leave the whales following the same speed and distance procedures described above.

In order for vessels to be clear of whales before dark, vessels should cease whale watching and begin their return to port 15 minutes before sunset.

Penalties:
A violation of the Marine Mammal Protection Act or the Endangered Species Act may result in fines or civil penalties of up to $10,000 or criminal penalties of up to $20,000 plus IMPRISONMENT and/or SEIZURE OF VESSEL and other personal property.

CONTACT NUMBERS

Whalewatching Information
For more information on the whalewatching guidelines or laws pertaining to marine mammals you should call**:**
National Marine Fisheries Service, Protected Resources Division -- 978-281-9254 OR
Gerry E. Studds/Stellwagen Bank National Marine Sanctuary --781-545-8026

Right Whale Sighting
All sightings of a right whale should be called in to the NMFS Sighting Advisory.
Sighting Advisory System -- 508-495-2264 or 978-585-8473 (Beeper)

Entangled Whale
Any sighting of an entangled whale should be reported. Vessels should stand-by and keep the whale in sight until help arrives, or arrange for another vessel to maintain contact with the whale.
Disentanglement HOTLINE -- 800-900-3622 or call the USCG on VHF CH-16

Dead Whale
Any sighting of a dead whale should be reported.
Marine Mammal Stranding Network -- 508-495-2090 or 978-585-7149 (Beeper)

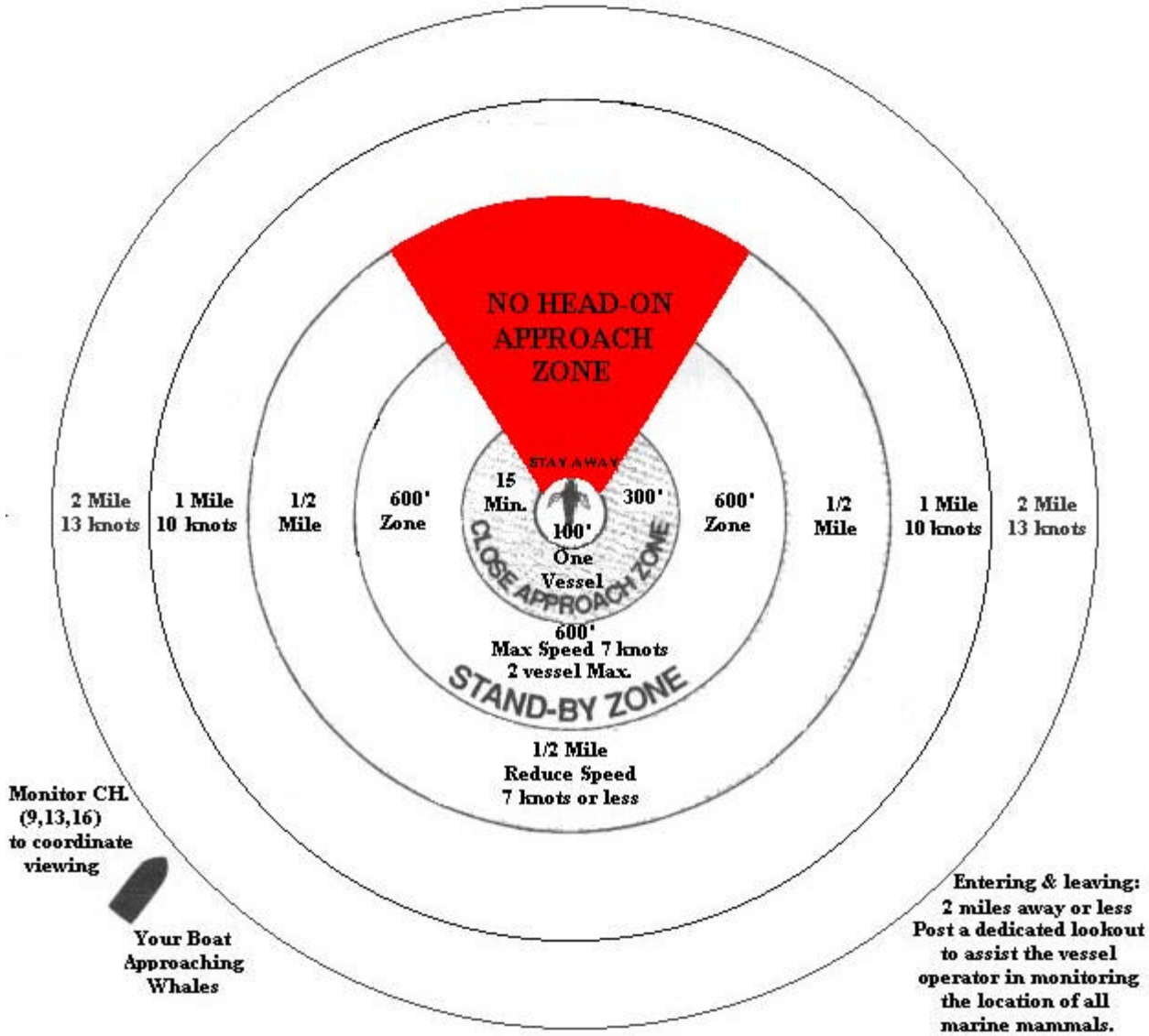
Potential Violations
Any reports of an activity that appears to be an intentional or negligent action leading to a collision or harassment incident should be called in to the NOAA Enforcement Office. Enforcement HOTLINE -- 800-853-1964

The National Marine Fisheries Service is the Federal agency responsible for protecting whales within U.S. waters under the Marine Mammal Protection Act of 1972 and the Endangered Species Act of 1973. It is part of the National Oceanic and Atmospheric Administration (NOAA).

The Gerry E. Studds/Stellwagen Bank National Marine Sanctuary is part of a network of marine protected areas chosen for their special ecological and/or historical significance including a central summer feeding ground for whales. The 842-square-mile area, between Cape Ann and Cape Cod, is administered under NOAA's National Ocean Service.

National Marine Fisheries Service
Northeast Region
One Blackburn Drive
Gloucester, MA 01930-2298
978-281-9254

Gerry E. Studds/Stellwagen Bank National Marine Sanctuary
175 Edward Foster Road
Scituate, MA 02066
781-545-8026


NO HEAD-ON APPROACH ZONE
STAY AWAY
15 Min.
300'
100'
One Vessel
CLOSE APPROACH ZONE
600'
Max Speed 7 knots
2 vessel Max.
STAND-BY ZONE
1/2 Mile
Reduce Speed
7 knots or less
2 Mile
13 knots
1 Mile
10 knots
1/2 Mile
600' Zone
600' Zone
1/2 Mile
1 Mile
10 knots
2 Mile
13 knots
Monitor CH. (9,13,16) to coordinate viewing
Your Boat Approaching Whales
Entering & leaving: 2 miles away or less Post a dedicated lookout to assist the vessel operator in monitoring the location of all marine mammals.

APPENDIX MMBD.IV – Personal Water Craft Guidelines

National Guidelines or Regulations

New Jersey: Wildwood Crest (New Jersey, USA) Environmental Commission enacted a "dolphin-safe zone" extending 200 feet from the water's edge, where gillnet fishing and boat/personal watercraft speeding is prohibited when dolphins are present.

*Gulf of Farallones NMS (GFNMS)***:** NOAA amends the regulations governing activities in the GFNMS to prohibit the operation of motorized personal watercraft (MPWC) within the boundaries of the GFNMS. This regulation is necessary to protect sensitive biological resources, to minimize user conflict, and to protect the ecological, aesthetic, and recreational qualities of the sanctuary. NOAA also announces the availability of an Environmental Assessment (EA) on the rule. Dates: Effective October 10, 2001. This study used a PWC to determine dolphin avoidance to boat traffic: Nowacek, S. M, R. S. Wells and A. R. Solow. 2001. Short-term effects of boat traffic on bottlenose dolphins, Tursiops truncatus, in Sarasota Bay, Florida. MMS:17(4):673-688. I don't know the original source of this quote: In particular, NOAA concluded that "marine mammals are more disturbed by [personal watercraft], which run faster, on varying courses, or often change direction and speed, than they are by boats…."

Hawaii NMS: PWC are banned in conservation districts and marine natural areas. They are not allowed from December 15-May 15 on the west and south sides of Maui to protect humpback whales.

Monterey Bay NMS (MBNMS): Motorized personal water craft means any motorized vessel that is less than fifteen feet in length as manufactured, is capable of exceeding a speed of fifteen knots, and has the capacity to carry not more than the operator and one other person while in operation. The term includes, but is not limited to, jet skis, wet bikes, surf jets, miniature speed boats, air boats, and hovercraft. MBNMS: Prohibits the Operation of motorized personal watercraft within the sanctuary except:

Within the four designated zones and access routes within the sanctuary.

INTERNATIONAL

Australia: Guidelines
Whale and dolphin watching from personal, motorized craft (e.g. jet skis and similar craft) and hovercraft is prohibited. Strict regulations govern approaches to whales and the law provides heavy penalties for disturbing or harassing them.

Australia: Jet Skis must never approach closer than 300m. When leaving whales, move off slowly at 'no wake' speed until at least 300 meters away (400 meters for jet skis).

Powered and Unpowered Vessels (including surfboards)

- Must never approach closer than 100meters. Jet skis (PWCs) must never approach closer than 300 meters
- If a whale is accompanied by calf do not approach closer than 200 meters
- Within 300 meters of a while' (400 meters for jet skis) move at a constant speed no faster than the slowest whale or at idle 'no wake' speed
- Approach from a direction parallel to the direction of movement of the whales and slightly to their rear
- Avoid sudden or repeated changes in speed or direction
- When stopping to watch whales either place your engines in neutral or allow the motor to idle for one minute before switching off
- No more than three vessels should attempt to watch a whale or whales at one time
- Do not 'box' whales in, cutoff their path, or prevent them from leaving

When leaving whales, move off slowly at 'no wake' speed until at least 300 meters away (400 meters for jet skis).

Azores: Regulation
No jet skis, sub-aquatic scooters, kayaks, boards and similar platforms

Mexico: Regulations for Humpback whales
Water skis, para-sails, gliders and helicopters are not permitted for whale watching.
Jet skis, kayaks, canoes and inflatable rafts with oars are not permitted for whale watching.

Puerto Rico: Regulations
It is prohibited to observe whales from jet skis.

Tonga: Guidelines
Human-powered paddle craft must not approach within 75 meters of a Whale.
The use of jet skis is banned for Whale Watching. If a jet ski is in the vicinity of Whales, a distance of 2,000 meters is required.

APPENDIX MMBD.V – FAA Overflight Regulations

Title 14 –Aeronautics and Space

CHAPTER I – FEDERAL AVIATION ADMINISTRATION, DEPARTMENT OF TRANSPORTATION

SUBCHAPTER F – AIR TRAFFIC AND GENERAL OPERATING RULES

PART 91 – GENERAL OPERATING AND FLIGHT RULES

Subpart B- Flight Rules

§ 91.119 Minimum safe altitudes: General

Except when necessary for takeoff or landing, no person may operate an aircraft below the following altitudes:

(a) *Anywhere.* An altitude allowing, if a power unit fails, an emergency landing without undue hazard to persons or property on the surface.

(b) *Over congested areas.* Over any congested area of a city, town, or settlement, or over any open air assembly of persons, an altitude of 1,000 feet above the highest obstacle within a horizontal radius of 2,000 feet of the aircraft.

(c) *Over other than congested areas.* An altitude of 500 feet above the surface, except over open water or sparsely populated areas. In those cases, the aircraft may not be operated closer than 500 feet to any person, vessel, vehicle, or structure.

(d) *Helicopters.* Helicopters may be operated at less than the minimums prescribed in paragraph (b) or (c) of this section if the operation is conducted without hazard to persons or property on the surface. In addition, each person operating a helicopter shall comply with any routes or altitudes specifically prescribed for helicopters by the Administrator.

APPENDIX MMBD.VI – National Marine Sanctuary Program's Regulations

Gulf of the Farallones National Marine Sanctuary (GFNMS)
"(5) Disturbing seabirds or marine mammals by flying motorized aircraft at less than 1000 feet over the waters within one nautical mile of the Farallone Islands, Bolinas Lagoon, or any Area of Special Biological Significance (ASBS) except to transport persons or supplies to or from the Islands or for enforcement purposes."

Monterey Bay National Marine Sanctuary (MBNMS)
"(6) flying motorized aircraft, except as necessary for valid law enforcement purposes, at less than 1000 feet above any of the four zones within the Sanctuary." (See 15 CFR §922 Subpart M, Appendix C)."

Hawaiian Islands Humpback National Marine Sanctuary
"(2) Operating any aircraft above the Sanctuary within 1,000 feet of any humpback whale except as necessary for takeoff or landing from an airport or runway, as authorized under the MMPA and the ESA."

Olympic Coast National Marine Sanctuary
"(6) Flying motorized aircraft at less than 2,000 feet both above the Sanctuary within one nautical mile of the Flattery Rocks, Quilayute Needles, or Copalis National Wildlife Refuge, or within one nautical mile seaward from the coastal boundary of the Sanctuary, except for activities related to tribal timber operations conducted on reservation lands, or to transport persons or supplies to or from reservation lands as authorized by a governing body of an Indian tribe."

APPENDIX MMBD.VII - A Summary of National and International Guidelines and Regulations for Aircraft for Watching Whales and Dolphins (Submitted by Carole Carlson, IFAW)

UNITED STATES

Northwest Region: Guidelines

- Aircraft include seaplanes, microlite and light aircraft. Aircraft must not approach closer than a height of 300 meters above a Whale.
- No aircraft may land on the water to Whale Watch. If an aircraft has to land in the vicinity of Whales a distance of 2,000 meters is required.
- The duration of a Whale encounter by aircraft is limited to five minutes or two approaches (sweeps).
- No more than one Whale Watching aircraft may be within five kilometers.
- Ban on helicopters for Whale Watching.

Alaska: Regulation

- Buzzing, hovering, landing, taking off, and taxiing near marine mammals on land or in the water are likely to result in harassment.
- Maintain a 1500 foot minimum altitude when viewing marine mammals from the air.

Southwest Region: Guidelines

- Aircraft should not fly lower than 1,000 feet while within a horizontal distance of 100 yards from a whale.

Hawaii: Regulations

- For humpback whales in Hawaii, federal regulations prohibit approaching closer than: 1000 feet (300 meters) when operating an aircraft.

Northern Right Whales: Regulation

- *Buffer Zone.* There is created a buffer zone surrounding a right whale which consists of an area outward from the right whale(s) a distance of 500 yards in all directions (as applies to whale watching).

INTERNATIONAL

Argentina: Regulations

- Do not operate lower than 150 meters over whales

Australia: General guidelines:

- Do not operate lower than 300 meters within a 300 meter radius on the slant of whales. This includes flying directly over and buzzing.
- Do not land on the water near whales
- Do not approach whales head on

- Helicopters are prohibited for whale or dolphin watching
- Helicopters in transit must be 1000 meters away from whales and not hover.
- Fixed-wing aircraft, including ultralights and hang gliders, MUST not be flown closer than 300 meters (approx 1,000 feet) above or near a whale. Helicopters must not be flown closer, than 400 meters (approx 1,300 feet) above or near a whale.

Azores: Regulations
- Do not operate lower than 300 meters over whales.

Brazil: Regulations
- Do not operate lower than 100 meters over whales.

Canada: General Guidelines:
The droning of an airplane engine and especially the beating of a helicopter rotor will be detected by whales near the surface.
- Do not descend lower than 450 meters (1,000 feet) from the water.

Johnstone Strait, Canada: Guidelines
- Limit approaches to 450 meters above the water over whales.
- Do not hover over, circle around, or "buzz" the whales.

Dominica: Guidelines
- No aircraft shall be used to watch whales
- When operating at an altitude of less than 600 meters, no aircraft shall be closer than 500 meters horizontally from a point above any marine mammal unless in the process of taking off or landing.
- Ensure that you are more than 300 meters from whales before attempting landings or take-offs.
- Helicopters are prohibited from watching sperm whales.

Dominican Republic: Regulations
- Flights of any nature cannot be made at height under 300 meters (1000 feet) when at a maximum horizontal distance of 300 meters away from the whale.
- Hydroplane landing is not permitted in any area where a whale is present.

Japan: Guidelines
- Do not approach within 300 meters of targeted whales, regardless of approach angles, from an airplane or helicopter.

New Zealand: Regulations
- *Marine Mammals*
  - When operating at an altitude less than 600 meters (2,000 feet), above sea level, no aircraft shall be closer than 150 meters (500 feet) horizontally from a point directly above any marine mammal or such lesser or greater distance as may be approved

by the Director General, by notice in the *Gazette*, from time to time based on the best available scientific evidence.
    - Pilots of aircraft engaged in a commercial aircraft operation shall use their best endeavors to operate the aircraft in such a manner that without comprising safety, the aircraft's shadow is not imposed directly on any marine mammal.
- *Whales*
    - No vessel or aircraft shall approach within 300 meters (1,000 feet) of any whale for the purpose of enabling passengers to watch the whale, if the number of vessels or aircraft or both already positioned to enable passengers to watch that whale is 3 or more:
    - Where 2 or more vessels or aircraft approach an unaccompanied whale, the masters concerned shall coordinate their approach and maneuvers, and the pilots concerned shall co-ordinate their approach and maneuvers:
- *Dolphins and seals*
    - No vessel or aircraft shall approach within 300 meters (1,000 feet) of any pod of dolphins or herd of seals for the purpose of enabling passengers to watch the dolphins or seals, if the number of vessels or aircraft, or both, already positioned to enable passengers to watch that pod or herd is 3 or more:
    - Where 2 or more vessels or aircraft approach an unaccompanied dolphin or seal, the masters concerned shall co-ordinate their approach and maneuvers, and the pilots concerned shall co-ordinate their approach and maneuvers.

Puerto Rico: Regulations

- It is prohibited to observe whales from airplanes at less than 1,000 feet from sea level.

St. Lucia: Regulations

- No aircraft is to be used for marine mammal watching.

Tonga: Guidelines

- Aircraft include seaplanes, microlite and light aircraft. Aircraft must not approach closer than a height of 300 meters above a Whale.
- No aircraft may land on the water to Whale Watch. If an aircraft has to land in the vicinity of Whales a distance of 2,000 meters is required.
- The duration of a Whale encounter by aircraft is limited to five minutes or two approaches (sweeps).
- No more than one Whale Watching aircraft may be within five kilometers.
- Ban on helicopters for Whale Watching.

APPENDIX MMBD.VIII – CODE OF FEDERAL REGULATIONS

50: § 224.103 – Special prohibitions for endangered marine mammals

(c) **Approaching North Atlantic right whales**

(1) *Prohibitions.* Except as provided under paragraph (b)(3) of this section, it is unlawful for any person subject to the jurisdiction of the United States to commit, attempt to commit, to solicit another to commit, or cause to be committed any of the following acts:
(i) Approach (including by interception) within 500 yards (460 m) of a right whale by vessel, aircraft, or any other means;
(ii) Fail to undertake required right whale avoidance measures specified under paragraph (b)(2) of this section.

(2) *Right whale avoidance measures*. Except as provided under paragraph (b)(3) of this section, the following avoidance measures must be taken if within 500 yards (460 m) of a right whale:
(i) If underway, a vessel must steer a course away from the right whale and immediately leave the area at a slow safe speed.

(ii) An aircraft must take a course away from the right whale and immediately leave the area at a constant airspeed.

(3) *Exceptions.* The following exceptions apply to this section, but any person who claims the applicability of an exception has the burden of proving that the exception applies:

(i) Paragraphs (b)(1) and (b)(2) of this section do not apply if a right whale approach is authorized by the National Marine Fisheries Service through a permit issued under part 222, subpart C, of this chapter (General Permit Procedures) or through a similar authorization.

(ii) Paragraphs (b)(1) and (b)(2) of this section do not apply where compliance would create an imminent and serious threat to a person, vessel, or aircraft.

(iii) Paragraphs (b)(1) and (b)(2) of this section do not apply when approaching to investigate a right whale entanglement or injury, or to assist in the disentanglement or rescue of a right whale, provided that permission is received from the National Marine Fisheries Service or designee prior to the approach.

(iv) Paragraphs (b)(1) and (b)(2) of this section do not apply to an aircraft unless the aircraft is conducting whale watch activities.

(v) Paragraph (b)(2) of this section does not apply to the extent that a vessel is restricted in her ability to maneuver and, because of the restriction, cannot comply with paragraph (b)(2) of this section.

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