MARINE MAMMAL BEHAVIORAL DISTURBANCE
(MMBD) WORKING GROUP
Perot Systems — 9:00 AM to 4:30 PM
22 January 2004

MEETING SUMMARY

ACTION*: *The meeting summary from the last meeting was approved but Carole Carlson's name needed to be added to the member's present list.

ACTION: Nathalie Ward will examine how user fees are collected by other federal agencies, such as NPS.

ACTION: Brian Hopper and Sharon Young will prepare a draft statement on the department of defense definition of harassment and government research just to have something on the record about it.

ACTION: Nathalie Ward will research the rational as to why certain regulations and guidelines were developed in other areas, such as Hawaii.

ACTION: The groups wants NMFS representatives to look at the FAA 1000ft overflight number in their whale brochure to see if this is correct or not.

ACTION: Sharon Young will develop a rationale sentence for each one of the emerging issues.

ACTION: Nathalie Ward will present NOAA's position on tuna spotter planes at the next meeting.

ACTION: Brian Hopper will find out if fisheries (tuna spotter planes) are exempt from overflight regulations.

ACTION: Nathalie Ward will look into having Jooke Robbins, Peter Tyack, and Darlene Ketten all at the nest MMBD meeting to address noise disturbance.

ACTION: Nathalie Ward will look into Personal Water Craft (PWC) restrictions in other sanctuaries.

ACTION: Nathalie and Sharon will work on the WW action plan wording for the next meeting.

ACTION: Dana Hartley requested that the Vessel Strike Working Group consider sea turtles strikes.

ACTION: The WG requested information regarding where the filtering for the pop-up buoys occurs. Is the sound filtered during the recording or in the lab after? Ask Chris Clark.

ACTION: Erin Heskett will look for the New Zealand whale watch regulations/certification program.

ACTION: Erin Heskett will ask Chris Clark about where filtering occurs re: pop-up buoys.

MARINE MAMMAL BEHAVIORAL DISTURBANCE

Working Group Attendees

NAME	WG SEAT and AFFLIATION
Regina Asmutis	Chair: SAC
Nathalie Ward	Team Lead: SBNMS
Dave Slocum	Whale Watching (NEAq)
Scott MacNeil	Commercial Shipping
Sharon Young	Conservation (HSUS)
Jack Kent	MMTA
Dana Hartley	NMFS
Brian Hopper	NMFS/NER
Kim Amaral	Academic (WHOI)
Peter Scheifele	Academic (UCONN)
Erin Heskett (Alternate)	Conservation (IFAW)

Technical Advisor

Pat Gerrior NMFS

Working Group Members Not Present

Henry McCarthy Tuna Fishing

Others Present

Deborah Marx (rapporteur) SBNMS

WELCOME, ADOPTION OF ADGENDA AND MINUTES

Nathalie Ward presented the meeting summary from the last meeting to the group.

ACTION: The meeting summary from the last meeting was approved but Carole Carlson's name needed to be added to the member's present list.

OLD BUSINESS and ACTION ITEMS

Nathalie Ward readdressed some of the action items from the last meeting to try and answer any questions that were raised. User Fees: User fees could only be collected if the demand came from outside SBNMS domain. SBNMS can't collect the fees but a larger entity could. For example: salt water fishing licenses could give part of their fee to SBNMS. It is still unclear how SBNMS could mandate the collection of fees.

ACTION: Nathalie Ward will examine how user fees are collected by other federal agencies, such as NPS.

- Nathalie Ward passed around the roster and asked the members to update their contact information and include the name and contact information of their alternate.

- Questions about FAA regulations (including those previously submitted by Peter Scheifele) were submitted and discussed. There are no SBNMS site-specific regulations currently by FAA (one reason might be because the SBNMS's proximity to Logan airport). Whales are not factored into FAA regulations; they are considered part of the ocean only. The group did not know how FAA regulations relate to noise. The group thought that an advisory circular needed to be developed pertaining to marine mammals for outreach purposes. They also felt that the notice to mariners network and aeronautical charts have the potential to include overflight text about SBNMS. The group wanted to know how other sanctuaries, such CINMS and OCNMS, dealt with FAA modifications. The group pointed out the inconsistencies in publications about overflight and approach distances to marine mammals.

- The group wanted to know how NOAA and NMFS dealt with regulations concerning tuna spotter planes. Currently there are no regulations on the subject but tuna fishermen have stated that they target whales and whale watch boats because of the possible presence of sand lance. This topic was going to be addressed in a future meeting because there was no fishing representative present. There was discussion that "tuna-spotter panes" should be brought up in Fishery Issues, as relates to public scoping comments.

- The department of defense definition of harassment and government research was raised but the topic was considered to be beyond the jurisdiction of this group and, therefore, the group would not make it an action item in the draft action plan. This will be included as an emerging issue.

ACTION: Brian Hopper and Sharon Young will prepare a draft statement on the department of defense definition of harassment and government research just to have something on the record about it.

Nathalie Ward stated that each strategy needed a rational or goal statement on how it related to the goal of the MMBD WG. The current situation of the issue should be included.

EMERGING ISSUES

The following Emerging Issues were identified by WG. Rationales for each will be forthcoming for next meeting.

- military vessels
- high speed ferries
- marine construction
- dive boats
- PWC
- wind turbines
- emerging fisheries
- parasailing
- kayaks
- whale watching planes
- shadow effects of overflight

REVIEW: DRAFT OVERFLIGHT ACTION PLAN

The draft overflight action plan was discussed and revised during the AM and PM session. See Appendix A.

FAA REGULATIONS: CONFERENCE CALL (Nancy Russo , FAA Boston Supervisor)

Q. How can SBNMS get marine mammal advisory information distributed through FAA?

A. Aeronautical charts are printed every 6 months. Request for charting made by air traffic decision. Call Angel Cases 781-238-7525 for more information.

Q. What are specific FAA publications where SBNMS could get new regulations incorporated into?

A. NOTAMS – advisories issued that are temporary based on a specific area of flight; and the Airport Facility Directory.

Q. What are FAA overflight regulations based on?
A. Current overflight regulations are based on precautionary measures. The minimum safe altitude in 500ft for uncongested areas, 1000 ft. for congested areas, 500 ft over open water or over any person, structure, vehicle, or vessel. Over Monomoy, overflight regulations are 2000 feet because it is a wildlife sanctuary and national park. NPS, USFWS, US Forest Area Service have standard markings on nautical charts (all Dept. of Interior). Airships are included in fixed wing regulations because they are N-registered. Helicopters are not included due to their unique landing capability.

SHIPPING TRAFFIC AND THE RIGHT WALE MANDATORY SHIP REPORTING SYSTEM (Pat Gerrior, NMFS Technical Advisor)

The presentation addressed the seasonality, volume, and frequency of ship traffic through SBNMS based on the mandatory ship reporting data.

Mandatory Ship Reporting System
The mandatory ship reporting system (MSR) (for vessels $\geq$ 300 Gross tons) is administered by NOAA, enforced by the USCG, and endorsed by IMO. It began in July 1999 and covers two reporting areas based on right whale critical habitats. Vessels reporting into Boston and/or transiting the reporting area must call in although there may be a loss of transients reporting. Ships report to a shore-based station and then in return receive a return message with information about right whale locations. The system works computer to computer. The operator must follow a prescribed format. Only if the message is formatted correctly, will a return message be received. The return message includes: general precautionary guidance (assume all whales are right whales); request for sightings of dead whales, entangled whales and right whales; dates through which right whales are expected to be active (if aggregations have been sighted). This is a year-round system in the Northeast Region (seasonal in the Southeast) but there has been a learning curve because of the transient nature of the business, language barriers and the increased

number of regulations post 911. The information is published in the Coast Pilot and the British Admiralty Publications.

A map of the MSR areas was displayed which capture only inbound traffic into Boston and the southern ports in Georgia and Florida. Vessels transiting the areas are also required to report their information. Required information includes: True Course; Speed in Knots; Destination Port; Routing Information. Three types of routing information can be collected: 1) a series of waypoints (most descriptive), 2) traffic separation scheme usage (only entrance and departure points), or 3) a rhumbline of two points. The more points the more useful the data. A map of vessel traffic in relation to SBNMS was displayed that showed 6 major lanes of traffic through or near SBNMS. There is consistency of vessel routes but there is inconsistency and seasonality when it comes to cruise ships and petroleum carriers.

Vessel Compliance

The compliance of vessels reporting in differs monthly. The MSR data is compared with the USCG 96 hour advance notice reporting when USCG port officials check vessels in port. To a lesser extent, monitoring is also done during dockside, USCG port state control inspections. The level of compliance appears to be increasing (~80%) but is substantially higher in the Northeast (60-80%) as compared to the Southeast (0-45%).

The NE marine pilots map shows not all traffic across the Cape Cod Canal is heading into Boston. A "fan" shows the diversity of post canal routes. The highest percentage of traffic is tug and barge eastbound and westbound. Vessels requiring a pilot will often avoid CCB as an onboard pilot may cost $6000.00. Traffic through the canal is monitored by the Army Corps of Engineers. Vessels ≥65feet must notify the Acorps when transiting the Canal. The types of ships are: passenger/dry cargo (self-propelled); tankers; towboats; dry cargo/scows (non-propelled); tanker barges (non-propelled); fishing; and yachts. In 2002, 3986 trips were documented traveling eastbound in the canal and 3999 trips westbound. The industry focus of the MSR areas is based right whales solely.

Discussion

- The WG considered whether this type of system may work for all whales and vessels < 300 GT within the Sanctuary.
- The WG requested info regarding where the filtering for the pop-up buoys occurs. Is the sound filtered during the recording or in the lab after? Ask Chris Clark.

Other notes:

- Pat indicated that, according to reports, the cruise ships and container ships can go 20-25kts but average speed reports are 15kts.
- LNGs are usually in port for 24-30 hours. Some ships are only in port for 12 hours.
- Traffic density is tariff dependent.
- Tug Boats do not currently report (<300GT because the barge and tug are not considered to be one unit. However, it is not clear how composite units are considered).
- There is some seasonality in shipping (cruise ships and petroleum) others are year round (container ships and LNGs).

Regarding the NOAA Fisheries RW Ship Strike Strategy:

- proposed measures are for CCB and off Race Point with some overlap with the Sanctuary;
- coordination with NOAA may result in CG conducting Port Access Route Studies (PARS). It is a public process;
- additional data on shipping, routing, etc. is possible but can not give details currently because they are in the interagency process;
- risk assessment for CCB vessel lanes is right whale specific.

PRESENTATION: BASIC BIOACOUSTICS SHORT COURSE FOR SBNMS'S WORKING GROUP (Peter Scheifele)

The presentation began with a description of the characteristics of sound, which are the physical (intensity, frequency, energy, velocity, and phase) and perceptual (loudness, pitch, energy, velocity, phase, and tone colour). The intensity is measured in terms of energy and it represents power. Definition of decibel: sound is measured as a ratio of intensity or pressure (only the physical measurement of sound). The reference pressure for sound measured in the air is 20_Pa (SPL), in the water it is 1_Pa. Water is denser than air and sound travels four to five times faster in water. The effect of temperature, salinity, and pressure = depth: as sound increases with increasing temperature, salinity: sound increases with increasing salinity, pressure: sound speed increases with depth.

Animals need to know the difference in intensity, frequency, timing, how often the sound is made (repetitious or transient), tone colour, and directionality to be able to function at a normal level of behavior. Sound is neither measured nor heard the same in water and air. Marine mammals have a different anatomy and physiology as compared to humans and the neuroanatomy may also differ.

Ambient Noise

Currents, tides, seismic activities, waves, rain, biologists, meteorologically induced noises, and anthropogenic noises cause ambient noise. Anthropogenic noise is manmade and sources and it includes vessels, construction, aircraft, drilling, fishing, and acoustic devices.

Masking

Mammals are affected by masking which is a process by which the threshold of audibility for one sound is raised by the presence of another sound (Yost 94). Masking represents the failure of the auditory system to successfully conduct frequency resolution of a signal due to the increased levels of surrounding sounds. It was pointed out that the brain structure of marine mammals is very different than the human ear. The sensory systems differ in structure and form so it is impossible for humans to understand what marine mammals hear. Hearing tests on marine mammals have been conducted and they have shown that the animals all have a different threshold curve.

Vocalization Characterization Models

Vocalization characterization models (computer algorithms) are used to identify the sound collected by buoys. Filters are used on the samples to take out the ambient and unwanted noise and these computers can be programmed to characterize the noise they record.

Ocean Noise Levels

He concluded that the noise levels are rising in the oceans and that merchant vessels (50-500 Hz) are only one of the causes {correct?), you should check with Peter on this one]. Peter indicated that 120dB relative to 1_Pa is considered to be too much as 120dB relative to 20_Pa is the point of approaching pain in humans. However, he also said that the ear doesn't hear the same in all frequencies so using 120dB across all frequencies is not sufficient. The DOD wants to increase the level to 180dB which appears likely to happen. He clarified the difference between temporary threshold shifts (TTS) and permanent threshold shifts (PTS).

Noise in shallow, coastal waters (such as the Sanctuary) is highly variable and the impacts on the whales depend on what the animals are doing and the depth they are at. Vessel noise comes from the hull type, the load, power plant, propeller, and jet wash. There appears to be virtually no difference in propeller versus jet drive noise. Much of prop noise is due to cavitation. If the engine is running but the prop is not spinning there is not a lot of cavitation. There is an increase in noise during start up as compared to when the engine is already running and when the prop is in gear as to opposed to when it is not spinning. Peter indicated that a problem to consider is the private boaters that keep their prop running in close proximity of whales.

Suggested SBNMS Research

- Sound is critical, especially for odontocetes. The most important research SBNMS should conduct is to identify the acoustic zones of influence to marine mammals. All of these zones need to be identified: zones of audibility, zones of responsiveness, zones of masking, and zones of auditory pathology. The intensity, frequency, and exposure are the most important factors to record in relation to vessel noise and the disturbance of marine mammals.

- Ideas to gather more data include: tagging; Identify noise sources; determine whether sound in the Sanctuary is increasing annually and, if so, due to what; determine the acoustic behavior of the animals; increase human awareness to recognize signs of stress in the animals.

- Making the shipping channels mandatory will not stop noise propagation and may not result in quieter zones.

DISCUSSION: NOISE DISTURBANCE ACTION PLAN

The group needs guidance on how to monitor shipping lanes. *One suggestion was to use a vocalization classification system to alert mariners to marine mammals*. [More explanation]. The research needs to be done to develop the technology to complete this goal.

Whale watching, fishing, and, other vessels may need to go with NMFS guidelines for noise but SBNMS needs to support the study of noise levels, sources, and propagation before suggesting their own guidelines or regulations. The noise levels in the ocean are rising. SBNMS needs to find out why! The regulation of private vessels will be difficult so education and outreach may be one solution. Enforcing the use of shipping lanes will not reduce the noise it will only concentrate the areas of shipping.

Private vessels conducting whale-watching activities are not the problem, the commercial vessels are. The group feels that the current stand-off distance is fine as they are. Knowing the hot spots

and knowing if, and where, marine mammals congregate is the area that needs to be addressed. The SBNMS must also learn if there are areas of vessel congregation (sound hot spots) and whether whales go to those areas.

- Does SBNMS want to adhere to proposed NMFS guidelines on noise which will likely be 180 dB?
- What about a permitting system within the Sanctuary if the Sanctuary goes with <180dB ?
- What is the highest level of noise that should be tolerated in SBNMS?

We should use SBNMS as a basis for knowing what noise levels are in other places and to provide information on what causes the noise. Monitoring should occur at different places, times, and seasons (i.e. H-buoy, Gomoos buoy, FA buoy, BE buoy, PH buoy, RP buoy could be used for monitoring sound using depth detectors within the first 30m).

In Europe, they are looking in to drafting an annex to Marpol regarding ship noise.

ACTION: Nathalie Ward will look into having Jooke Robbins, Peter Tyack and Darlene at the next meeting to address noise.

ACTION: Nathalie Ward will look into PWC restrictions in other sanctuaries.

ACTION: Nathalie and Sharon will work on the overall action plan wording for the next meeting.

REVIEW: DRAFT WHALE WATCH ACTION PLAN

The draft Whale Watch Action Plan was discussed and revised. See Appendix B.

NEXT STEPS AND SUMMARY

During the next meeting the issue of noise will be addressed. Fishing will be left to later meetings.

NOTE: The 21 January 2004 Agenda was revised: Pat Gerrior's talk was before lunch and a conference call with FAA was introduced and scheduled after lunch. Brian Hopper, Dave Slocum, Jack Kent, and Peter Sheifele left before we discussed the WW AP. Kim, Erin, Dana, Regina, and Nathalie remained for discussion of enforcement.

U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Marine Sanctuary System
Stellwagen Bank National Marine Sanctuary
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Scituate, MA 02055
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Marine Mammal Behavioral Disturbance
Management Plan Review Working Group
22 January 2004
9 A.M. to 4:30 P.M.

AGENDA

9:00 – 9:15	Welcome, Adoption of Agenda and Minutes
9:15– 9:30	Old Business: Action Items
9:30– 10:15	*Review: DRAFT Overflight Action Plan*
10:15-10:30	Break
10:15 – 11:45	*Review: DRAFT Whale Watch Action Plan*
11:45 - 12:15	Acoustics: Peter Sheifele
12:15 – 12:45	*Lunch*
12:45 – 2:15	Acoustics: Peter Sheifele (Continued)
2:15 – 3:15	Mandatory Ship Reporting, Pat Gerrior (NMFS), Technical Advisor
3:15-3:30	Break
3:30 – 4:15	Discussion: Noise Disturbance Action Plan
4:15 – 4:30	Next Steps and Summary
4:30	Adjourn

APPENDIX A

DRAFT: 2/5/2004 MMBD WG

Action Plan: SBNMS Marine Mammal Behavioral Disturbance

Goal Statement
The goal of this working group 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.

2.C.3 Issue Addressed: Overflight Harassment

SBNMS OVERFLIGHT ACTION PLAN

Introduction

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) [not sure how to deal with this- since tuna spotting planes are a specific concern with overflight but there was a discussion they should be pushed to fishing, how do we rationalize it??]

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?

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*. is this 1995 also?). This is especially true with calm seas, deep water, or shallow water with a nonreflective 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 at altitude 160 m, they received levels of low-frequency tones 18 m 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

Fill in (re: shadowing (Pers Comm. Carlson 2003) and airflow: Pers. Comm. Scheifel 2003))

Summary of Possible Concerns

Fill in

Literature Cited: (Appendix I)

Evaluation of Existing Regulations Addressing Overflight in Vicinity of Whales

- SBNMS Regulations
  None to date.

- Federal Aviation Administration (FAA) Regulations (Appendix II)
  The existing regulations are the Federal Aviation Administration's (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 … *(fill in)*

- National Marine Sanctuary Program (Appendix III)
  There are overflight regulations in the following national marine sanctuaries: Gulf of the Farallones NMS, Monteray Bay NMS, Hawaiian Islands Humpback Whale Sanctuary, and Olympic Coast NMS. (See attachment).

- NMFS North Atlantic Right Whale Overflight Guidelines (Appendix IV)

- NOAA Research Aerial Survey Guidelines (Appendix V)

- National and International Guidelines and Regulations as Applies to Whale and Dolphin Watching (Appendix VI)

- NE Regional Guidelines (even though they may be wrong, they currently exist)

SBNMS Overflight Strategies and Implementation
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.*

Strategy OV-1 Develop Outreach Guidelines

Activities:
1.1 Work with pilot associations to include SBNMS notation and guidelines (Are we going with "guidelines" or regulations here? Or are we asking for the current NMFS guidelines to be added, remember they may be wrong) on aeronautical charts and information materials.

1.2 Work with cross-jurisdictional enforcement agencies to monitor and enforce overflight guidelines.

Strategy OV-2: Develop Overflight Regulations as exist in other sanctuaries

Goal: Minimize behavioral disturbance of marine mammals in SBNMS from overflight activities

Activities:
Rationale:

2.1a 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 NMFS." *OPTION A — Rationale*

2.1b While the need of overflight guidelines is acknowledged, insufficient information exists at this time to specify min alt. *OPTION B — Rationale*

2.2 SBNMS should recommend that NOS ask NMFS 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."

Strategy OV-3: Identify Information Gaps

Activities:
Rationale:

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

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

3.3 Request NMFS (NE region) to look at inaccuracy of its characterization of FAA regulations in its whale watch guidelines.

The group was divided upon what the actual minimum height or radius numbers should be. Seems to be a lack of data to support established minimums. The group was also concerned about research permit holders and whether SBNMS should be part of the permitting process or should simply be notified.

Strategy OV-4: Emerging Issues (See Appendix …)
Rationale:
And sentence explanation for each of bullet points below

- DOD Harassment research (not able to deal with)
- Commercial aerial whale watching
- Tuna spotter planes

APPENDICES

APPENDIX I: Literature Cited

APPENDIX II: *Federal Aviation Administration (FAA) Regulations*

APPENDIX III: *National Marine Sanctuary Program*

APPENDIX IV: *NMFS North Atlantic Right Whale Guidelines*

APPENDIX V: *NOAA Research Aerial Survey Guidelines*

APPENDIX VI: A Summary of National and International Guidelines and Regulations for Aircraft for Watching Whales and Dolphins (submitted by Carole Carlson, International Fund for Animal Welfare)

APPENDIX VII: *References and Consultants* (Identification of resources informing decision-making process of MMBD WG)

APPENDIX I: Literature Cited

Carlson, Carole. 2003. Personal Communication. International Fund for Animal Welfare.
Ketten, Darlene. 2000.
Patenaude 2002.
Richardson 1995.
Scheifele, Peter 2003. Personal Communication. University of Connecticut.

APPENDIX II: FAA Overflight Regulations

APPENDIX III: National Marine Sanctuary Program's Regulations [regs or guidelines?]

(Review regs for wording)

Gulf of the Farallones National Marine Sanctuary

> " (5) Disturbing seabirds or marine mammals by flying motorized aircraft at less than 1000 feet over the waters within one NM of the Farallone Islands, Bolinas Lagoon, or any ASBS except to transport persons or supplies to or from the Islands or for enforcement purposes."

Monteray Bay National Marine Sanctuary

> "(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 described in appendix c to this subpart."

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 NM of the Flattery Rocks, Quilayute Needles, or Copalis National Wildlife Refuge, or within one NM 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 VI: A Summary of National and International Guidelines and Regulations for Aircraft for Watching Whales and Dolphins (Submitted by Carole Carlson, International Fund for Animal Welfare)

USA

Northwest Region: Guidelines [I just moved this to the left to keep it consistent]

- Aircraft include seaplanes, microlite and light aircraft. Aircraft must not approach closer than a height of 300 metres 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 metres 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 is 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 m) 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.

[Brian Hopper: specified that this is only applicable to planes that are whale watching?]

INTERNATIONAL

Argentina**:** Regulation

- Do not operate lower than 150m over whales

Australia: General guidelines:

- Do not operate lower than 300m within a 300m 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 1000m away from whales and not hover

Azores: Regulation

- Do not operate lower than 300m over whales

Brazil: Regulation

Do not operate lower than 100m 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 metres (1,000 feet) from the water.

Johnstone Strait, Canada**:** Guidelines

- Limit approaches to 450 metres 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 500m horizontally from a point above any marine mammal unless in the process of taking off or landing.
- Ensure that you are more than 300 metres from whales before attempting landings or take-offs.
- Helicopters are prohibited from watching sperm whales

Dominican Republic**:** Regulation

- Flights of any nature cannot be made at height under 300m (1000feet) when at a maximum horizontal distance of 300m 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 co-ordinate 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 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: Regulation

- 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 metres 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 metres 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 B

Action Plan: SBNMS Marine Mammal Behavioral Disturbance

Goal Statement
The goal of this working group 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.

Whale Watch Approach Action Plan

Background
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:

2.C.1 Whale Watching Activity

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?

Introduction
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 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 *20 companies* operating more than 30 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 also 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 (Whitehead and Moore 1982). 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 NMFS 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 United States National Marine Fisheries Service (NMFS), Northeast Region, convened a Whale Watch Advisory Group (WWAG) to discuss the impact of whale watching on whales within the Gulf of Maine and to review the effectiveness of current guidelines. The WWAG was comprised of commercial enterprises, conservation and animal welfare groups, and the NMFS. Recommendations included reduced speeds when in sight of whales, and limits on the number of vessels within 183m (600 feet) of whales.

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 and the Stellwagen Bank National Marine Sanctuary have collaborated on an innovative new public education campaign entitled "See A Spout, Watch Out! Responsible Whale Watching". Additionally, the International Fund for Animal Welfare worked with the state of Massachusetts, the Center for Coastal Studies and the NMFS to distribute educational material 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. As such, it is important to balance economic needs with conservation and the following recommendations are offered.

Evaluation of Existing Regulations

- NMFS Whale Watch Guidelines – Northeast Region (See Appendix ..)

Strategies and Implementation
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.*

Strategy WW-1: Development of regulations governing the operation of vessels in the vicinity of whales, porpoises, and dolphins.

Activities:

1.1 SBNMS should draft regulations based on the currently existing NMFS (NE region) guidelines applicable to all vessels in the vicinity of whales (with existing exceptions applicable for fishing vessels towing gear [define towing gear ? as "trolling" is not considered towing gear by the CG but could be considered as "towing gear" by NMFS and since there is a lot of "trolling" out there, this should be clarified] or vessels investigating entanglements). Use the Coast Guard definition of vessel to assure inclusion of personal watercraft and kayaks. [CG 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."

1.2 Prohibit the use of motorized personal watercraft in SBNMS

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

While kayaks may be outside the purview of this working group in regard to disturbance to marine mammals physically and acoustically, the working group did indicate concern for human safety when kayaking around whales and suggested that kayaks be prohibited around whales. The WG requests that the SAC review kayaks as an issue of human safety.

1.5 Investigate feasibility of a two tiered certification program, such that certified vessel operators would be permitted to approach whales under the current NER NMFS guidelines (100 feet) but non certified vessel operators would be required to comply with national NMFS recreational boater (300 feet) guidelines.

Strategy WW-2: Enforcement

Activities:

There is currently inadequate enforcement of SBNMS regulations and guidelines and the WG feels that there needs to be an increased enforcement presence in SBNMS, particularly during high use periods.

2.1 Mandate regular Sanctuary enforcement presence on the Bank

2.2 Seek funding for dedicated vessel and staff to enforce Sanctuary regulations.

2.3 Distribute warning tickets to vessels violating whale approach guidelines/regulations.

Strategy WW-3: Outreach/Education

Activities:

3.1 Distribute information detailing penalties for violating regulations/guidelines.

3.2a Future management actions may consider a stringent certification program based on New Zealand's program.

3.2b Investigate the feasibility of a certification programs for whale watching captains.

3.2 Develop a biennial or annual conference to which educators and naturalists are invited to learn about SBNMS resources, research, conservation, and regulations. Providing PDPs and education materials to be used in classrooms, whale watch vessels, and in continuing education units.

Strategy WW-4: Research

Activities:

4.1 Keep track of how many commercial [commercial and recreational?] whale watch vessels are using the Sanctuary to track trends in commercial whale watch activity over time. Additionally, continue trackline survey studies to monitor distribution of whales and vessels in the sanctuary spatially and temporally.

4.2 Develop a whale tagging program to determine short term and cumulative impacts on whales. (more)

4.3 Establish a baseline for cumulative impact studies.

4.4 Baseline sampling to establish ambient noise levels within and outside the sanctuary.

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

4.6 Identify and where appropriate initiate partnerships with various entities conducting acoustic research.

4.7 Develop a mechanism to model cumulative acoustic impacts (eg. Depth finder, vessel types and speed)

Considerable discussion focused on whether certification is an enforcement issue or an outreach issue. General agreement that it would best fit as an outreach issue since it will be very difficult to get certification amended onto a vessel captains license as administered by the Coast Guard.

Strategy WW-5: Emerging Issues

See Appendix

APPENDICES

Appendix I: Literature Cited
Appendix II: NMFS Whale Watch Guidelines – Northeast Region
Appendix III: Personal Water Craft Guidelines

APPENDIX I: Literature Cited

Baker, S.1988. Behavioral response of humpback whales to vessels in Glacier Bay., p.16 in Proceedings of the Workshop to Reiview and Evaluate Whale Watching Programs and Management Needs., 14 –16 Nov. 1988, Monterey, Calif., Center for Marine Conservation, Washington, D.C.

Corkeron P J 1995 Humpback whales (*Megaptera novaeangliae*) in Hervey Bay, Queensland: behaviour and responses to whale-watching vessels, Canadian Journal of Zoology 73 (7): 1290-1299.

Donovan, G.P. 1986. Behavior of whales in relation to management, Report of the International Whaling Commission, Special Issue 8, International Whaling Commission, Cambridge, U.K.

Hoyt, E. 2001. Whale Watching 2001: Worldwide tourism numbers, expenditures, and expanding socioeconomic benefits. International Fund for Animal Welfare, Yarmouthport, MA USA, pp.i-vi; 1-158/.

Robbins, J. 2000. A review of scientific contributions from commercial whale-watching platforms. Paper SC/52/WW9 presented to the International Whaling Commission Scientific Committee June 2000 (unpublished). 11 pp.

Whitehead, H., and Moore, M.J. 1982. Distribution and movements of West Indian humpback in winter. Canadian Journal of Zoology. 60 (9) 2203-2211.

APPENDIX II: NMFS Whale Watch Guidelines — North East Regin

APPENDIX III: Personal Water Craft Guidelines

Australia: Guidelines
- Whale and dolphin watching from personal, motorized craft (e.g. jet skis and similar craft) and hovercraft is prohibited

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 metres 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 metres is required.