Report on 2003 Activities and Action Plan for 2004 to Protect Northern Right Whales: Implementation of the Commonwealth's Right Whale Conservation Plan

Submitted to the

National Marine Fisheries Service
And
National Fish and Wildlife Foundation

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from
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I. INTRODUCTION

This report summarizes The Massachusetts Division of Marine Fisheries (*MarineFisheries*) Year 2003 efforts and 2004 action plan involving its North Atlantic Right Whale Conservation Program and its support of the federal Large Whale Take Reduction Plan. The Commonwealth's Right Whale Conservation Program has broadened its scope of work since its inception in 1996 when a court-appointed Endangered Whale Working Group provided that the Commonwealth develop a plan to address the threats to North Atlantic right whales in state waters. At that time, the plan called for the following:

- Restrict use of certain gear types to reduce risk of entanglement in Critical Habitat during times of expected whale occurrences;
- Modify certain fixed fishing gears;
- Control future increases in fishing effort;
- Support future gear research and modifications of fixed gear for future deployment in the Critical Habitat;
- In conjunction with other agencies, NMFS, private research groups, such as the New England Aquarium, and the Center for Coastal Studies, develop a surveillance-based management plan to protect right whales;
- Yearly review of modifications and restrictions;
- Establish an educational program for fishermen and other impacted users;
- Enhance disentanglement efforts.

II. FUNDING SOURCES

Funding for the 2003 program was obtained from the National Marine Fisheries Service (NMFS) and the National Fish and Wildlife Foundation (NFWF). The NFWF, along with NMFS, provided $497,825 to support core components of the Commonwealth's Right Whale Conservation Program. This included $267,185 to fund *MarineFisheries* ' contract to the Center for Coastal Studies (CCS) for the Right Whale Surveillance and Monitoring Program in Cape Cod Bay (CCB) and adjacent waters, $12,000 for ghost gear removal in Cape Cod Bay, $3,442 for outreach, $160,546 in support of a two-year gear study with the Atlantic Offshore Lobstermen's Association (AOLA), and lastly, $54,652 to support a Program Coordinator to oversee the Commonwealth's highly successful and expanding program. NMFS directly approved a $15,000 grant to support a gear modeling study on fixed fishing gear. In addition to funding, NMFS directly participated in the gear modeling study.

III. CONSERVATION PLAN SPECIFICS AND ACCOMPLISHMENTS

During the period January 1 – December 31, 2003 *MarineFisheries*' Right Whale Conservation Program accomplished the following:

1. Surveillance, Habitat Monitoring, and Management

For the seventh consecutive year as part of a management strategy, *MarineFisheries* conducted the highly successful Surveillance and Habitat Monitoring Program for North Atlantic Right Whales in Cape Cod Bay and adjacent waters for the period, January 1 - May 15, 2003. The majority of this program was executed through a contract to the Center for Coastal Studies and involved aerial and vessel-based surveillance, as well as habitat monitoring. All right whale sightings were communicated to the NMFS/ SAS system and the University of Rhode Island, home of the right whale database. Photo documentation of right whales was sent to the curators of the right whale catalog at the New England Aquarium (NEAq). Habitat reports and forecasts on likelihood of right whale presence and residency in CCB were available

in near real-time.

A. Right Whale Surveillance and Monitoring

For the sixth consecutive year, the program effectively monitored for the presence of right whales in Cape Cod Bay and adjacent state waters during winter and spring months. Right whale photo-documentation, demographics, habitat usage, and movement patterns were obtained. All aspects of the surveillance and monitoring program aid in the effective management of this highly endangered species. See report by Dr. Moira Brown et al, 2003, (Attachment A) for details.

Aerial surveillance of Cape Cod Bay and adjacent waters consisted of 36 flights, encompassing 129.4 flight hours, between December 10, 2002 and May 15, 2003. The results for 2003 show that a small number of right whales arrived in the Bay in early January, departed the Bay for several weeks during February and March, and returned in larger numbers in April (see Figure 1). In addition, there were a number of right whale sightings during March east of the Cape between Truro and Nauset, MA. To date at least 72 different whales have been identified from surveys in Cape Cod Bay and adjacent waters for the 2003 season. This is similar to the number of right whales seen over the previous six seasons, however, this is a minimum count, since photo-analysis is still underway (see Table 1). The first right whale sighting by the surveillance program in Cape Cod Bay was on January 6, 2003, and the last sighting was on April 30 for a minimum population residency time of 115 days during the surveillance season.

There were, however, opportunistic sightings of right whales from the Dolphin Fleet whale watch boats from at least April 13 to July 27, 2003, and October 19 and 20, 2003, and the report of a right whale off of Barnstable on August 27, 2003 (see Cape Cod Times August 28th).

Table 1: Number of Right Whales Documented in Cape Cod Bay and Adjacent Waters by Year

Year	# of Right Whales
1998	91
1999	86
2000	96
2001	87
2002	24
2003	72

Whale distribution within the Critical Habitat portion of Cape Cod Bay was similar to previous years with nearly all sightings in the eastern and southern portions of the Bay.

B. "Out of Season" and "Out of Habitat" Right Whale monitoring

There were abundant reports of right whales in state waters during the summer and fall of 2003. In fact, the large number of reports was reminiscent of the 1987 season in which a portion of the right whale population stayed in Massachusetts's waters throughout the summer. While no funds were awarded to cover "off season" and "out-of-habitat" responses, *MarineFisheries* and its contractors responded on a number of occasions to reports of right whales during this time. On April 30, Bill Hoffman of *MarineFisheries* sighted and reported to the SAS three right whales skim feeding outside Salem Harbor. On July 7, Ed Lyman also of *MarineFisheries* with the assistance of John Tulik of the Division of Law Enforcement (DLE) responded by boat to the report of a mother and calf right whale off Plum Island, MA. On October 20, CCS responded to a report of a right whale sighted by a whale watch

vessel outside of Provincetown Harbor. Unfortunately, for both responses the animal(s) were not relocated. On November 26, Ed Lyman and John Tulik, aboard one of DLE's patrol boats, responded a second time to a general report of right whales in state waters and covered more than 140 nm of water between Cape Ann and Cape Cod, including Cape Cod Bay. The large number of right whale sightings reported during the off season prompted *MarineFisheries* to re-submit a proposal to NMFS to establish a pilot program in 2004 where whale watch vessel owners, operators, and naturalists would be enlisted as cooperators in *MarineFisheries*' efforts to provide photo-documentation of right whales in Massachusetts and adjacent waters. The proposal would provide for temporary authorization of certified and trained whale watch vessel operator and naturalists to approach right whales within 500 yards on a case-by-case basis to document and assess these "out-of-habitat" and "out-of season" right whales. The proposal is included in Attachment B.

C. Right whale habitat analysis and the utility of habitat sampling data to forecast right whale presence, and movement patterns in Cape Cod Bay.

The Commonwealth continued to contract CCS to carryout habitat monitoring of Cape Cod Bay from January through mid May, or during the time right whales typically frequent the Bay. The monitoring provided a better understanding of the right whales' habitat requirements, and determination of the utility of biotic and abiotic habitat parameters to provide a reliable trigger to allow managers to forecast right whale presence, residency, and movement patterns in CCB. CCS carried out physical and biological oceanographic sampling of Cape Cod Bay during 20 cruises between Jan 9 and May 10, 2003. Sampling included CTD casts, net tows, and pumping and subsequent filtering of water samples at depth and along the surface. In order to enumerate and characterize the right whales' habitat and food resource in CCB in a timelier manner as to provide a better management tool, four stations, representing each quadrant of the Bay, were established and consistently sampled on every cruise.

Results of sampling showed that CCB remained relatively unproductive in respect to midwater copepod densities right on through to midseason. This was correlated with right whale densities, during the period. Around mid April sampling indicated that zooplankton biomass was on the rise and had peaked by late April. However, unlike past years in which the resource remained elevated for several weeks to a month or more, the zooplankton resource underwent an immediate decline.

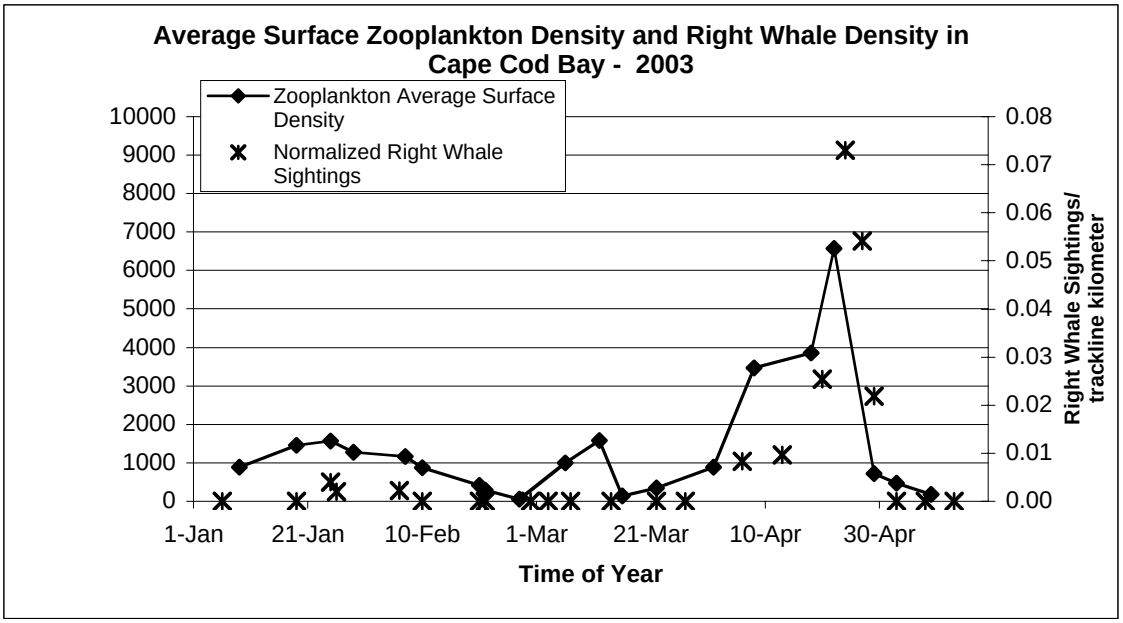

Figure 1. A comparison of mean zooplankton density estimated from samples collected at the surface in Cape Cod Bay as compared to right whale density calculated from aircraft surveys in the winter and spring of 2003.

Comparison of right whale sightings from vessel and aerial-based platforms to the food resource again showed that right whale numbers mirrored the resource. In fact, Dr. Mayo used the relationship between right whales and their food resource, to provide near real-time predictions on right whale numbers, residency and movement patterns in the Bay. This correlation, along with CCS' sampling methodology proved to be extremely representative and timely. As Dr. Mayo and colleague's report indicate (Mayo et al, 2003), CCS had much success in utilizing habitat parameters to forecast the likelihood of right whale presence, residency, and movement patterns in CCB during the 2003 season. The importance of this additional tool for right whales management cannot be understated, and is being pursued and improved upon for next season. The CCS Habitat Monitoring report, as well as the near real-time cruise reports forecasting right whale presence, residency and movement patterns in CCB are included in Attachment C.

CCS continues to synthesize its historical plankton monitoring data from Cape Cod Bay to complete a comprehensive analysis and publish their findings in peer-reviewed scientific journal.

D. Collaboration and assistance in the use of archival and real-time passive acoustics to detect and monitor right whales in state waters.

MarineFisheries has been collaborating with Dr. Christopher Clark of Cornell University, for the past three years to monitor right whales using passive acoustic, archival "Pop-ups", in situ devices that detect vocalizing right whales and store the detection for later retrieval and analysis. *MarineFisheries'* support for Dr. Clark and his associates, International Fund for Animal Welfare and Woods Hole Oceanographic Institute include funds awarded through NFWF and NMFS for vessel charters deploy and retrieve "Pop-ups" in CCB and the Great South Channel (GSC). In addition, to improve the Commonwealth's Right Whale Conservation Program's ability to detect the presence of right whales continuously and in near real-time, especially in CCB Critical Habitat and surrounding waters, *MarineFisheries* has more recently assisted Dr, Clark in pursuing real-time acoustic monitoring of right whales. Specifically, the agency has enlisted the assistance of the United States Coast Guard (USCG) by requesting the use of navigation buoys as platforms for additional autonomous, real-time listening stations. Presently, the Coast Guard has agreed and funds to establish two additional continuously monitoring, web-based, real-time, passive acoustic detection modules mounted on Coast Guard navigation buoys in Cape Cod Bay have been partially obtained. One of these buoys will most likely be established around February 2004 and the second, contingent on a funding proposal to the Massachusetts Environmental Trust (MET), would be established sometime during the summer of 2004 (Letter of Inquiry submitted on October 28). In addition, *MarineFisheries* pursued cellular phone capability for real-time listening buoys, and with the help of Division of Law Enforcement mapped and quantified cellular phone coverage and signal strengths in the CCB and surrounding waters where these buoys are to be placed. Real-time monitoring of right whales will not only improve the Commonwealth's Right Whale Conservation Program, but will greatly improve the federal SAS system that warns ship operators of right whales. The proposal for use of Coast Guard – maintained navigation buoys as platforms for listening stations, and letter of support to Dr. Christopher Clark are included in Attachment D.

E. Management and implementation of improved regulations to further reduce the risk of right whale entanglement in Massachusetts's fixed-gear fisheries.

In addition to the Surveillance, and Habitat Monitoring Program, and the state's collaborations with Dr. Clark and others to acoustically monitor right whales, the state will continue to aggressively, yet prudently, regulate the fixed-gear fisheries in its waters. Beginning this past season (Jan 1, 2003) the use of floating groundline was prohibited in the lobster fishery in Cape Cod Bay Critical Habitat (CCBCH).

Starting in January 2004 this requirement will extend to apply to the waters west of the CCBCH and south of Brant Rock. A copy of the current Massachusetts regulations (322 CMR 12:00) can be found in Attachment E. The Commonwealth continues to pursue ways to broaden the use of non-buoyant groundlines in the pot fishery throughout state waters and the range of the Northern Right Whale.

On April 24, 2003, the state took several precautions due to an unexpected large number of right whales observed by the aerial surveillance, and the presence of a rich food resource measured by the habitat monitoring team, which suggested the animals could remain in CCB for several weeks. First, to address the ship strike threat, the state issued an urgent warning to all mariners operating in Cape Cod Bay to be on the lookout for endangered right whales. Second, to address the entanglement threat, the state extended the fishing requirements that apply to Cape Cod Bay Critical Habitat beyond the designated April 30 date by 9 days to May 9. Additional aerial surveillance and habitat monitoring later determined that right whales left the bay before May and that the food resource had decreased considerably, indicating no further extension of the state's "whale-safe" fishing regulations were necessary. On May 8, 2003, using this information, the state issued a notice that right whales had departed CCB and that gear restrictions and advisory were lifted. Attachment F contains copies of the above-mentioned advisories and notices.

2. "Ghost Gear" removal project in Cape Cod Bay.

MarineFisheries continued the annual gear removal program in CCB for the sixth consecutive year. *MarineFisheries'* personnel along with local fishermen and Massachusetts Environmental Police carried out 7 trips during March and April to remove ghost and/or noncompliant gear, as well as, document, monitor and enforce gear regulations established by the Commonwealth to protect right whales. Efforts were coordinated with aerial surveys to find gear in CCB. In the end, nearly the entire bay was covered (See map, Attachment G), and a record amount of ghost gear (310 pots) was removed by the program's efforts. However, more importantly was the success of the program in getting fishermen to comply with the gear rules (not wet store their gear in CCB), providing a significant reduction to the entanglement threat. A list of cruise dates, areas covered, daily reports and amount of gear removed is also included in Attachment G.

3. Fixed gear studies to better understand line profiles in order to reduce risk of entanglement.

MarineFisheries greatly increased its gear modification research during 2003. Beginning in March, *MarineFisheries*, in cooperation with the NMFS, conducted studies on the modeling of buoylines and groundlines to better understand the physics of their profiles in the water column and the threat of entanglement they pose. The modeling was supported by a grant from NOAA Fisheries and was conducted in collaboration with the NOAA Fisheries Gear Team. Modeling experiments were carried out in a 22 M flume tank housed at the Centre for Sustainable Resources at St. Johns, Newfoundland. Modeling was then followed by full-scale comparison in the field. One particular observation from the modeling was that once currents approached .5 kt, the profile of a modeled buoyline configured with buoyant line at its lower terminus was similar to that of a buoyline configured entirely of negatively buoyant line. This finding suggests that the use of a 1/3-float line at the bottom of a buoyline might not pose a significant increase in entanglement threat. The engineering report as well as an abstract of the overall study is included in Attachment H. The final report will be completed in January 2004 and be available on the DMF website. Copies (as well as a video) are available for NMFS and the Take Reduction Team members as well as fishermen's associations, and any interested public.

MarineFisheries is presently working with the Atlantic Offshore Fishing Association (AOLA), the

cordage industry, and fishermen in the first of its kind two-year study to develop an "optimal" non-buoyant line for use as lobster pot groundlines to lower groundline profiles and thereby reduce the risk of entanglements with large whales. For the lobster industry, "optimal" will be lines that do not degrade due to abrasion from substrate contact, are strong enough to withstand hauling loads, and are not substantially more expensive than currently used rope products. To date, a survey has been designed and mailed to over 700 pot fishermen from Maine to Virginia to canvass the fishing industry in order to assess the current line types in use with their associated advantages and shortcomings. Over 160 surveys have been returned thus far. Also, more than 6 rope manufacturers have been identified who are capable and willing to produce optimal, non-buoyant line for use as a ground line for the offshore lobster fishery. A line simulator that will simulate long-term wear and tear on lobster trawl lines developed by the cordage companies has just been fabricated. The simulator/ tester will begin testing lines from cordage companies in January. The study will continue throughout 2004 with line testing in the lab and with fishermen using the lines in the field. Attachment I provides a summary report of survey returns, and a schematic and photograph of the finished line tester.

In addition to the above studies, a buoyline rig utilizing the offsetting buoyancies of two buoys to reduce the buoyline's profile was devised and tested in field experiments. While the rig does greatly reduce the profile in the water column, it remains to be determined the practicality of its use for the fishing industry.

4. Education Efforts (Outreach)

MarineFisheries' staff continued ongoing public education efforts regarding Right Whale Conservation and the Massachusetts Conservation Plan throughout 2003 by meeting with industry groups, fielding calls, and lecturing in public forums. *MarineFisheries*' Edward Lyman wrote an article in the prominent trade journal, *Commercial Fisheries News,* on the state's efforts with the AOLA to come up with an optimal non-buoyant groundline for the offshore pot fishery. A version of the article was also published in the Massachusetts Lobstermen's Association, AOLA, and DMF newsletters. It can also be found on the DMF website. *MarineFisheries*' staff attended various fishermen's meetings, trade shows, and conservation meetings promoting the Conservation Plan. Formal presentations were given in many of these meetings and shows. The *Commercial Fisheries News* article, a Gloucester Daily Times article on a community lecture given on right whale conservation efforts, and a list representing outreach efforts are provided in Attachment J.

DMF's Dan McKiernan, the Director of the Commonwealth's Right Whale Conservation Program, is a member of the Atlantic Large Whale Take Reduction Team (ALWTRT). Ed Lyman, the Coordinator of the Right Whale Conservation Program, is a member of Stellwagen Bank National Marine Sanctuary's Entanglement Workshop Team.

5. Support disentanglement efforts

The Commonwealth continued to support the efforts of the Disentanglement Network. With the acquisition of Ed Lyman, the state has a high-level (level 5) disentangler and first responder strategically located in the north shore area of Massachusetts. In addition to participating to actual disentanglement events on a case-by-case basis, Ed has performed valuable outreach and training on the topic of disentanglement. On June 23, the Division responded to a report of an entangled humpback on southern Jeffrey's Ledge. Unfortunately, a rescue effort could not be mounted at the time. In early August, Ed participated a weeklong high-level disentanglement-training workshop along with CCS' David Moran. In addition, numerous lectures have been given on the topic of entanglement in marine mammals.

The Massachusetts Division of Law Enforcement has offered to assist disentanglement efforts by

providing on-the-water support to respond to reports of entangled, endangered whales, and in the event of a rescue effort, stand by. DLE, if necessary, will also transport rescue team members.

IV. ACTION PLAN FOR 2004 AND FUNDING SOURCES.

The Commonwealth, along with its contractor CCS has already worked to improve the 2004 Right Whale Surveillance and Habitat Monitoring Program. Much of this effort has been focused on meeting increased safety standards implemented by NMFS for the aerial surveillance program (See NMFS aerial requirement included in Attachment K). In addition, *MarineFisheries* is acquiring an Optical Plankton Recorder (OPC) for the Habitat Monitoring Program to improve CCS' ability to quantify habitat parameters in CCB as to better forecast right whale presence, residency and movement patterns. Funds amounting to $391,620 to support the aerial surveillance and habitat monitoring of CCB for the 2004 season have been awarded by the NMFS.

MarineFisheries has also received $210,016 from NFWF for 2004 to continue support of their Program Manager / Protected Species Specialist, outreach program, and gear modification work. The Right Whale Conservation Program will finish research into development of an optimal line for the offshore lobster industry in 2005.

MarineFisheries will continue collaborating with Dr. Clark in the use of both archival and real-time passive acoustics to detect right whales. In addition, the Commonwealth, with the assistance of the USCG, will equip two navigation buoys in CCB with Dr. Clark's listening arrays. Funds to purchase the autonomous listening arrays have been awarded by NFWF and additional funds are being sought from Massachusetts Environmental Trust and NFWF.

MarineFisheries is also collaborating with Dr, Mark Baumgartner of Woods Hole Oceanographic Institute to quantify the right whales' use of the water column in order to identify what gear types and gear components may pose the greatest risk of entanglement to the North Atlantic right whale. In particular, we are interested in examining how right whale diving behavior overlaps with fishing gear in the water column. By identifying those gear types or elements that are at greatest risk of interaction with right whales, we hope to focus gear modification efforts to reduce or eliminate entanglements. The Commonwealth has been awarded $89,600 from NFWF to carry out this project during the summer of 2004.

MarineFisheries has submitted a letter of inquiry to Massachusetts Environmental Trust for $38,000 to tag basking sharks, which feed on the same resource as right whales, with archival pop-up tags, in the hope that the sharks will provide additional clues on the right whales' distribution and movement patterns during the winter, a time of the year in which we know very little.

The agency is collaborating with the International Fund for Animal Welfare and the Massachusetts Lobstermen's Association to establish a gear exchange program that will financially assist inshore, Massachusetts's lobstermen to replacing buoyant groundlines with a low profile, non-buoyant alternative that will greatly reduce the threat of entanglement. These efforts coincide with the Commonwealth's efforts to reduce all groundline profiles throughout the pot fisheries.

List of Attachments:

Attachment A) Surveillance of North Atlantic Right Whales in Cape Cod Bay and adjacent waters - 2003. Final Report. Chapter One, by Dr. Moira W. Brown, Marilyn K. Marx, and Owen C. Nichols.

Attachment B) Proposal to create the Massachusetts Right Whale Conservation Team for Whale Watch Vessels: Pilot program to use Massachusetts-based whale watch vessels to photo-document right whales sightings 2003. by Dan McKiernan, Massachusetts Division of Marine Fisheries.

Attachment C) Surveillance of North Atlantic Right Whales in Cape Cod Bay and adjacent waters - 2003. Final Report. **Chapter Two, Right Whale Occurrence and Habitat Measures in Cape Cod Bay, 2003.** by Charles Mayo, Moriah Bessinger, and Moira Brown.

Attachment D) Proposal to United States Coast Guard to Participate in a Collaborative Effort in the: Use of Real-time, Passive Acoustics to Detect and Monitor Right Whales (Eubalaena glacialis) in Cape Cod Bay. 2003. by Ed Lyman and Christopher Clark**.**

Attachment E) Current Massachusetts regulations (322 CMR 12:00) regarding fishing regulations in Cape Cod Bay.

Attachment F) Advisories and notices posted by Commonwealth regarding Cape Cod Bay critical Habitat and endangered North Atlantic right whales.

Attachment G) Ghost Gear Removal Report. 2003. Brian Kelly and Ed Lyman Massachusetts Division of Marine Fisheries**,**

Attachment H) Buoy-Line Rigging Evaluation, Centre for Sustainable Resources, Memorial University, St. Johns, Newfoundland, 8/2003; Abstract for Scale Modeling of Fixed Fishing Gear to Compare and Quantify Differently Configured Buoyline and Groundline Profiles: An Investigation of Entanglement Threat.

Attachment I) Summary report of survey returns and schematics and photographs of the finished line tester.

Attachment J) Commercial Fisheries News article: DMF, AOLA need to hear from you: What's needed in neutrally buoyant rope? list of outreach efforts.

Attachment K) **NMFS aerial surveillance safety requirements for 2004 season.** National Marine Fisheries Service