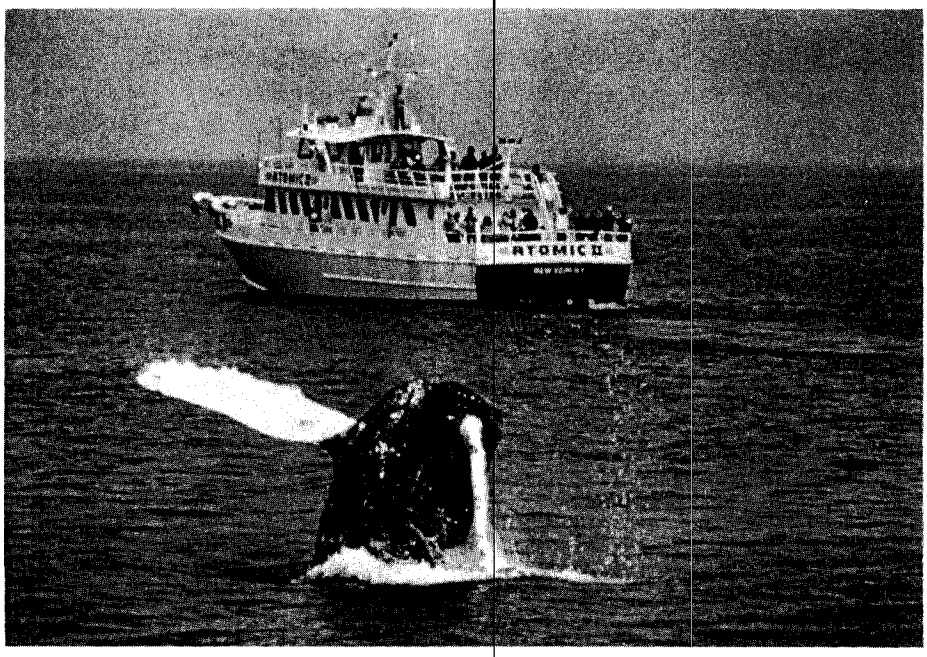
Proceedings of the Workshop to Review and Evaluate Whale Watching Programs and Management Needs

November 14-16, 1988, Monterey, California



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Cover Photo: Watching humpback whale "Triton" on Stellwagen Bank, Massachusetts.
Photo by Bill Rossiter

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We were fortunate to have had the assistance and participation of many talented and enthusiastic people during the formulation of this workshop. In particular, we wish to thank Dr. Nancy Foster, Director of the Office of Protected Resources, National Marine Fisheries Service for ensuring that funding for the workshop was available. Also in Washington, DC, the staff of the Office of Protected Resources and the Center for Marine Conservation contributed many long hours arranging for the workshop and evaluating the outcome of discussions that took place. In Monterey, Patricia Warhol of the American Cetacean Society, and Katharine Keeley of Conference Concepts assisted with numerous logistic hurdles and made our job easier. Finally, we wish to express our heartfelt thanks to all of our participants who contributed their thoughts, concerns, and ideas to the workshop.

Natasha Atkins
Steven L. Swartz, Ph.D.

Center for Marine Conservation

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INTRODUCTION

Whale watching has become an important economic, educational and recreational activity for hundreds of thousands of Americans annually. For many, watching whales is the first introduction to the marine habitat. And for some researchers, whale watching trips provide an opportunity for close study of whales. The growth of whale watching has spurred the economies of whale watch operators and many coastal towns. Major whale watching centers exist in the Northeast, the West Coast, Alaska and Hawaii.

The precipitous growth of the whale watching industry has been accompanied by concerns that whale watching may cause both biological problems for the whales and legal problems for whale watchers. The great whales are vulnerable to injury and disturbance by boats. They are slow-moving, can escape only by diving, and in some regions, such as Hawaii and Baja California, are distributed in limited areas. Vessel traffic may subject whales to impacts ranging from displacement of cow/calf pairs from nearshore waters to increased energy expenditure when feeding is disrupted or migratory paths rerouted. There is even concern that whale watching may act to "domesticate" wild animals and habituate them to potentially dangerous vessel activity. Alternatively, perhaps it is to the whales' benefit if they can acclimate readily to the presence of humans. The extent to which such impacts occur, and whether they affect whale populations adversely, are still largely unanswered questions.

Whales are protected from "harassment" by federal law, but managers face the difficult task of determining whether harassment has occurred. Consequently, there has been a need for enforceable measures to protect whales from activities that could constitute "harassment." Over the years a number of measures have been developed -- educational materials have been distributed in conjunction with issuance of guidelines or regulations -- and implemented with varying success.

In spite of these commendable attempts to make whale watching safer for the whales, there are still calls that more needs to be done. Some suggest the need for a better biological definition of "harassment". For example, federal agencies rely on regulations that use terms such as "disrupt normal behavioral patterns" or "disturbing or molesting" an animal, but there is no further definition of "normal" behavior, "disturb" or "molest." Others believe the solution lies in enforceable regulations in the form of distance limits on vessels approaching whales. Many prefer more emphasis on education, rather than regulation.

The impetus for this workshop lay in these continuing concerns about the protection of whales, and in the continuing frustration of managers and enforcement agents charged with this task. For the first time, knowledgeable representatives of the industry and of the conservation, management and scientific communities from throughout the United States and Canada were brought together to review whale watching activities and available information on the effects of whale watching on the whales. The goal was then to give direction to the National Marine Fisheries Service in carrying out its responsibility to protect whales from potentially harmful activities associated with whale watching.

The workshop was held on the November 14-16, 1989 at the Monterey Conference Center in Monterey, California. The first day was devoted to invited presentations from representatives from the National Marine Fisheries Service, the National Park Service, the

whale watching industry, and private organizations with educational or research-oriented whale watching programs. On day two, presentations continued, with the focus on research concerning the responses of whales to vessels and other disturbance. On the afternoon of the second day and on day three, three panels were convened to synthesize information and make recommendations on 1) the effects of whale watching, 2) research needs regarding whale watching, and 3) management concerns. The meeting agenda and a list of participants and observers are included as Appendices A and B, respectively.

INVITED PRESENTATIONS

Note: The information contained in the following abstracts of the invited presentations may represent the author's opinion. No attempt was made to verify statements or facts presented.

THE VIEW FROM THE NATIONAL MARINE FISHERIES SERVICE

Purpose and Objectives of the Workshop

- Charles Karnella, Office of Protected Resources, NMFS

One of my reasons for being here is to explain why NOAA Fisheries is here. There are three primary reasons for the agency's interest in convening this workshop on whale watching: 1) we need to assemble what we know about whale watching -- where it occurs, at what levels, and what species are involved; 2) we need to assess the effects of whale watching on whales; and 3) this assembled group needs to help NOAA Fisheries develop a sound policy on whale watching.

Why do we need a whale watching policy? First, there are two legislative reasons, the Marine Mammal Protection Act and the Endangered Species Act. To uphold our responsibilities under these statutes, we have to make sure that marine mammals are not harmed, or that populations are not precluded from recovering due to certain activities. Second, NMFS has received petitions to regulate whale watching. One petition asked us to prohibit whale watching on right whales in New England. Another petitioned for regulations to preclude approaching whales closer than 500 feet. In short, recently there has been pressure on the agency to take regulatory action. Rather than rushing into regulations, we believe that we need first to get the appropriate information to develop a sound policy that provides protection for the whales without putting undue restrictions on activities.

I will briefly give you a few examples of whale watching activities, and why we are concerned about them. You will hear about these in more detail from other speakers, and about what is being done in each Region. In Hawaii, female humpbacks and their calves apparently have abandoned certain areas, and there is a concern that this is due to increased vessel traffic in those waters. Our concerns about vessel traffic, and whale watching in particular, have led us to try public education programs, guidelines, and currently, interim regulations to help protect humpback whales in Hawaii.

In Alaska, whale watching has developed into a significant component of the tourism industry. Charter services that previously specialized in guided hunting and fishing trips have added whale watching to their standard operations. We are concerned that an unrestrained general increase in vessel activity could have an adverse impact on whales, causing them to abandon areas that they would otherwise use for feeding or migration.

New England waters abound with whales from May through September, and with whale watching vessels, too. If

too many vessels get too close to whales, especially the highly endangered right whale, the animals may be forced out of their normal feeding grounds or nursing activities may be interrupted.

In California, the accessibility of migrating gray whales has led to the development of a large and diverse commercial whale watching industry. Again, we are concerned that these activities may affect the gray whale migration by pushing whales out of their preferred migratory routes.

In addition to these areas, you will hear about whale watching activities in Puget Sound, in the Gulf of Mexico, and along the Florida coast.

You will notice that in mentioning the areas in which we are concerned about the impacts of whale watching on whales, we use terms such as may adversely, could adversely affect, could force the whales from nursing areas or feeding grounds. We use such conditional terms because there is a lot of information that is not conclusive, a lot that hasn't been agreed upon, and in some cases, the information simply has not been developed yet. What we need to do is compile what we do know, and determine what other kinds of information are still needed to develop a rational policy for the agency.

You participants represent diverse perspectives. You are here as representatives from the government, the industry, the scientific community or the conservation community. Your perspectives may be regional, commercial, or oriented toward research or public education. Almost everyone here represents a combination of these, and that is why we believe that the individuals gathered for this workshop can bring special insights and experience that will result in both the government and the industry taking the most responsible actions concerning whale watching.

After participants share this information in their presentations, three panels will consider the issues that we believe are the foundation of any public policy regarding whale watching. These questions concern the effects of whale watching, research that needs to be done, and what our management policy sould be. We begin by asking whether a commercial activity that exploits an endangered species is ethical. Is whale watching a tool to promote the conservation of an endangered species, or is it a threat to these species? After that the questions become less philosophical, but not less difficult.

When all is said and done at this workshop, what we need are recommendations that are tangible, practical, and workable. Our charge to the panels is: Give us recommendations that we can use to develop a policy on whale watching that is fair, that actually benefits the species, and in the end benefits everyone.

Legal Responsibilities Regarding Whale Watching

- Martin Hochman NOAA General Counsel

The Marine Mammal Protection Act (MMPA) and the Endangered Species Act make it illegal to "take" or attempt to "take" marine mammals in U.S. territorial waters or on high seas. Under these statutes, the United States doesn't assert jurisdiction over U.S. citizens in foreign waters. In MMPA regulations, NMFS has attempted to define "take" better, to include negligent or intentional acts that result in disturbing or molesting a marine mammal. A major cause of the problems stemming from whale watching is that the public doesn't know what is expected of them. Distance regulations provide a clearer understanding for the public, and make a case easier on the prosecutor because it

is difficult to make a judgment on whether a whale was harassed. Since 1977, the NOAA General Counsel has dealt with 39 cases involving whale harassment in California and Hawaii. Fourteen were dismissed, most of which required showing that harassment had occurred. (See Appendix C).

Southwest Region

- Jim Lecky

Whale watching in California, which primarily targets migrating gray whales, has grown rapidly since the mid 1960s. In general, whale watch operators are well-informed. Most of the problems with whale watching have involved the public, and the cases of harassment that NMFS has prosecuted have involved private boaters. NMFS has therefore targeted the public in an education campaign, although getting information out to the public is still a problem. In California, NMFS has adopted whale watching guidelines that establish minimum approach distances for vessels and aircraft and operational guidelines for vessels. "Harassment" is interpreted as any action that elicits an abnormal behavioral response. Overall, NMFS believes that harassment from whale watching is a minor problem compared to other human-induced problems for whales and their habitats, which deserve a greater proportion of NMFS resources. Concern over whale watching should be directed to other whale populations that, unlike the gray whales, are not recovering or that show signs of only very slow recovery.

Northeast Region

- Doug Beach

Whale watching companies in the Northeast Region operate from Connecticut to Maine. At least 21 companies rely on whale watching for all or most of their income. Whale watching is conducted from April to October, and concentrates on Stellwagen Bank and Jeffrey's Ledge in the Gulf of Maine. Humpbacks, which are seasonal residents and show marked site fidelity, are the focus of whale watching, but fin and minke whales and white-sided dolphins are also commonly observed. Northeast whales are subjected to a number of other human activities such as commercial fishing, shipping, and recreational tuna fishing on Stellwagen Bank. Whales in the Northeast apparently are tolerant of heavy vessel traffic. Problems occur when boats congregate around whales, and when boaters are ignorant of how to operate around whales and disturb their feeding. NMFS believes that whale watches can be a good source of information for the public, as many of them have naturalists on board. Professional whale watch captains are usually experienced in working around whales. From early on, NMFS has met with whale watch skippers to discuss laws that protect whales and how to operate vessels around whales. NMFS has focused education on private boaters. The Northeast region has issued guidelines, which are not used as a legal interpretation of harassment, but provide vessel operation procedures. (See Appendix D). These guidelines were developed in cooperation with commercial whale watch operators, biologists and conservationists, and aim to embody a concept of awareness of a whale's presence and its space requirements.

Pacific Area Office

- Eugene T. Nitta

Whale watching in Hawaii derives in large part from popularized research on whales in conjunction with a large tourist base. In Hawaii, there are about 60-75 commercial whale-watch vessels, ranging from small inflatables to 100-foot vessels, in Hawaii. A Hawaii Whale Watch Association was organized in 1985,

and established a code of vessel operation. However, there were questions about how strictly members adhered to their own code and some internal organizational problems. The Association was inactive in 1987 and is considering reorganization and reactivation this year.

The Hawaiian population of humpbacks is subjected to physical and acoustic disturbance from various types of vessel traffic, including commercial, recreational and military, as well as air traffic. Helicopter tours remain a potential problem for whales. Several collisions with whales have occurred, though not with whale watch vessels. In 1979, NOAA Fisheries issued a Notice of Interpretation (NOI) of harassment which included approach limits and defined harassment as substantial disruption of whale behavior. Inclusion of distance limits was seen as a compromise for enforcement purposes. By 1985, NOAA Fisheries had found that the NOI was losing its effectiveness as an enforcement tool, in that harassment cases were becoming difficult to prosecute because enforcement agents had to document substantial disruption of normal whale behavior patterns. Recognizing these problems, NOAA Fisheries published an interim rule which codified the distances in the NOI. (See Appendix E). Earlier reluctance of industry to accept guidelines or regulations appears to be changing, at least on Maui. Thus far, there have been no objections from the industry regarding enforcement of the interim rule. Problems still remain in getting word out to some sectors of the industry and public, such as private boaters and dive charters. A major component of the NOAA public education program has been the publication and distribution of a popular brochure on humpback whales.

Alaska Region

- Steve Zimmerman

The length of Alaska's coastline is equivalent to that of the rest of the United States, and whales are found throughout the State's marine waters. The principal areas in which whale watching occurs are either near population centers or in areas of scenic grandeur such as Glacier Bay. Although eight species of endangered whales occur in these waters, principal concern is for the humpback whale because it occurs in nearshore areas which are accessible to many local boaters.

Four general types of vessels pursue whales in Alaska: 1) Large cruise ships or tourboats that advertise nationally and may bring hundreds of tourists to Alaska each trip, 2) local day trip vessels that charter for fishing or wildlife viewing, 3) privately owned motor vessels, and 4) vessels that carry out permitted or quasi-scientific research. Large cruise ships or tourboats occasionally chase humpbacks in order to provide photographic or naturalist opportunities for their passengers. NMFS believes that the operators of these vessels are generally responsive to guidance indicating that pursuit of whales is illegal. Day trip operators often indicate that they must provide glimpses of wildlife in order to stay in business. However, their operations are often small and they cater to a clientele that is generally protective toward whales. Private recreational boaters may be the greatest offenders in terms of harassing whales. This occurs because there are so many private boats in Alaska, and some of the owners may harass or injure whales when approaching them out of curiosity. Presently, there are approximately ten permits that allow scientific research on whales in Alaska. Some of the permit holders may rent berths on their vessels to people who wish to participate in scientific whale watching cruises. Other groups that

also sell space on "research" vessels have been found to be lacking any NMFS authorization.

The NMFS Alaska Regional Office believes that whale watching regulations, not guidelines, must be implemented, and that they must include enforceable minimum intentional approach distances. Such regulations for Alaska were first drafted in 1985; for a variety of reasons they are still on hold. Glacier Bay, which is under the purview of the National Park Service, is presently the only area in Alaska in which whale watching is regulated. Because NMFS has only ten agents to carry out all of its enforcement activities throughout the State, it must rely on reports from concerned citizens to help us make cases against individuals or organizations who harass or pursue marine mammals.

Northwest Region

- Sally Mizroch

Whale watching in the region focuses on gray whales and killer whales. Coastal gray whale watching is primarily by off-season fishing charters. Among these commercial whale watch operators there is a good deal of cooperation and self-policing. Whale-watching on orcas in Puget Sound is largely by private boaters. Whale-watching guidelines developed by the region also include seals and sea lions. Guidelines have to take into account the navigational limitations of the area. Public education about the effects of activities on whales is key, and NMFS has distributed posters to marinas. Increased education, such as through publications and lecture programs is desirable. In addition, greater monitoring and enforcement may act as a deterrent to harassment of marine mammals.

Southeast Region

- Charles Oravetz

There is no extensive commercial or recreational whale watching in the southeast region. There is a potential for whale watching on humpbacks in the Virgin Islands, and on right whales off Georgia. Other related programs are those in Florida that involve feeding or swimming with dolphins. NMFS, in cooperation with the Virgin Islands Fish and Wildlife Service, operates a marine mammal sighting network in the Caribbean. No enforcement problems with whale watching have been reported from the Caribbean. One potential conflict with whales is the construction activity at a nuclear submarine base on the Georgia coast, where right whales occur.

WHALE WATCHING PROGRAMS AND CONCERNS

American Cetacean Society (ACS)

- Tom Lewis
  ACS Los Angeles

Whale watching programs are a cooperative effort betwen ACS and the Cabrillo Marine Museum. ACS trains naturalists to work on whale watching boats and to lecture to school groups, and tests naturalists to ensure that they are qualified to lecture to the public. ACS education programs focus on gray whales, but also discuss dolphins, pinnipeds and marine birds, and the history and geology of the harbor area. In return for providing trained naturalists, ACS receives 10% of the receipts from the whale watches. Profits from the ACS program are funnelled back into the program or into research projects. ACS believes that the greatest problem is from private boat owners, especially when large numbers of vessels follow a single whale.

Cetacean Society International

- Leslie Shields

Cetacean Society International (CSI) believes that nothing can compare with actually seeing whales in their natural environment as an experience for learning about whales and general marine ecology. As whale watching became more popular and the industry grew, it became clear that guidelines were needed. CSI board members cooperated with naturalists, whale boat captains and NMFS to develop guidelines for the Northeast region. CSI published these as posters which were distributed to the whale watch companies and marinas. Brochures, which included information about whale watching and the guidelines, were distributed to the public. We have had contact with thousands, perhaps millions, of boaters through the Connecticut Marine Trades Association boat shows and the Coast Guard Auxiliary. We produced and distributed a Public Service Announcement concerning boat handling around whales. In 1983, CSI sponsored the WHALES ALIVE! conference. CSI's Hartford School Project uses whale watching as a motivation for an essay and art contest and to introduce inner city children to environmental issues.

Whale Watching in Southeast Alaska

- Gary Vequist and Marvin Jensen
  National Park Service

Whale watching activity by cruise ships, charter boats and tour boats has increased in the last several years even though the National Park Service (NPS) does not allow boats to get closer to whales than 1/4 mile. Declining whale counts in 1978-1979 prompted Park Service regulations on vessel traffic in the Bay. Regulations limit the number of vessels in the Bay during the summer, and restrict vessel operation near whales. NPS regulations also provide for the establishment of temporary whale waters with restrictions on vessel speed and/or movement. NPS prohibits the harvesting of whale prey species within the Bay. NPS has intensified its research effort to further protect whales. NPS places naturalists aboard each cruise ship and tour boat that enters the Bay to point out and explain primary natural features including whales. There is evidence that some whales entered the Park because of disturbance outside the Park, and changes in whale behavior in response to vessels have been observed. Passengers

aboard cruise ships have expressed concern about the proximity of vessels to whales. Recently, whale watching activity has increased just outside the Bay at nearby Point Adolphous, where whales are more concentrated and can be seen more consistently. NPS believes that more consistency in protective measures throughout Alaska is necessary, and that education programs for protection of whales from whale watchers should be expanded. NPS believes that it is time for the whale watching industry to exercize greater restraint in approaching whales at close distances and believes that ethical questions about interfering with wild animals need to be addressed.

New England Aquarium

- Brian MacDonald and Doug Hall

The mission of the New England Aquarium is to make known to the public the "world of water" through education, research, conservation and the exhibition of aquatic life. The Aquarium began whale watching in 1977. The Aquarium considers whale watching to be a natural exhibit, educating the public through this extension of its own facilities. The Aquarium now has its own whale watching vessel, and the naturalists that accompany whale watches discuss the natural history of whales and educate the public about NMFS guidelines. They also discuss the history of Boston Harbor and the islands and current environmental problems of the Harbor. NEA's curriculum guide is distributed to schools and youth groups for grades K-12. NEA also has outreach programs on whales and whale watching in the greater Boston schools during the off-season. In addition, NEA stresses the importance of the use of mass media whenever possible to educate the public about whales and marine conservation.

Channel Islands Interpretive Programs

- Irene Osterman
  Island Packers

Island Packers runs recreational-educational trips to the Channel Islands. Whale watching excursions are offered from January through March within the Santa Barbara Channel. Naturalists discuss geology, natural history, and environmental issues of the area. All crew members, including captains, are trained in natural history, and all captains are trained in how to maneuver a vessel near whales. Island Packers also operates a "floating classroom" for children grade 5 through college level, which involves topics such as navigation, marine biology and oceanography and is staffed in large part by interns from the University of California. In addition, Island Packers conducts a whale watch geared specifically for school-aged children, preceded by a lecture on natural history of the whales. Island Packers crew members contribute to research by forwarding marine mammal census reports to the American Cetacean Society, the Cabrillo Marine Museum and the Santa Barbara Museum of Natural History. Education concerning whales and possible disturbance of their migration should focus not only on the commercial whale watch industry and the public, but also on scuba diving vessels and oil industry vessels in the vicinity of whales.

Whale Watching and Data Collection

- Phil Clapham
  Center for Coastal Studies

Whale watching vessels provide an opportunity for researchers from many institutions throughout the Gulf of Maine. This has provided more comprehensive sighting coverage than in any

other whale habitat in the world. Advantages of working from whale watching vessels include free, continuous coverage of research areas, and freedom from vessel maintenance problems. The disadvantages include little control over schedule and compromise of research time due to public interaction. The nature of whale watching operations precludes or makes difficult the estimation of abundance based on random sampling or mark-recapture data, the collection of behavioral data, or bioacoustical studies. Whale watch trips can generate a detailed picture of occurrence and distribution of whale species and patterns of movement, population structure, reproduction, recruitment and behavior. These data can be used to assess areas of critical habitats, and can provide other information useful for management purposes. Perhaps the greatest scientific value of whale watching is the insight into the life histories of individual whales. Whale watching has enabled the individual identification of more than 550 humpback whales and the aging and sexing of more than 150 and 250 whales, respectively. Only a minority of whale watching vessels carry scientists, which results in a great loss of potential information on whale populations.

Baja Lagoon Whale Watching Programs

- Margie Stinson
  Fisherman's Landing

Whale watching expeditions follow the migration of the gray whales and visit the three major breeding lagoons in Mexico. All trips are accompanied by scientists and naturalists, and the focus is not just on whales but also deserts and other habitats encountered around the lagoons and the islands that are visited. The Mexican government has established the lagoons as sanctuary areas, and there are strict controls on the number of vessels permitted to enter the lagoons and on the areas vessels can visit in the lagoons. Because of Mexico's policy of revoking all permits if there are any transgressions, the system is generally self-policed effectively. One potential problem is that, as publicity about the lagoons has increased, visitors now expect to be able to touch the whales. While it appears that the whales control any interactions with people, there are safety concerns about approaching the whales closely in small skiffs.

New England Whale Watching

- Jim Douglas
  Cape Ann Whale Watch

The Daunty Fleet has been running whale watching trips out of Gloucester, Massachusetts, since 1979, and all trips are accompanied by naturalists. Although roughly 300,000 passengers altogether are taken out annually by Massachusetts companies, the number of whale watching companies operating in the state has decreased recently, resulting in a 40-50% decline in the number of commercial whale-watch vessels in the past two years. There is a lot of cooperation between the owners and operators and between the scientists of different research groups. Skippers inform others of the location of whales, but are careful to limit the number of boats around the whales. Whale watching has a positive impact on the whales and on the public by 1) having naturalists or researchers present, 2) enabling donations from the public to the research groups represented by the naturalists, 3) providing opportunities for research, and 4) aiding in the sighting of injured or entangled whales. The major problem for whales comes from private operators. If greater efforts are not made to identify and report offenders, the blame for harassment will fall on the industry. However, NMFS has a limited capability for such enforcement.

Response of Whales to Whale Watching in Southern California

- Michael Bursk
Dana Wharf Sport Fishing

Dana Wharf employs a full-time spotter plane during gray whale migration to locate whales. Radar and radio are also used to "hand off" whales from one vessel to another along the coast. Even though the technology has improved and the whale population has been increasing, fewer whales are being seen on commercial whale watching trips. 1988 was a bad year for watching whales, with whales being sighted on fewer than 50% of the trips. However, according to some sources, many whales are being seen offshore. There is no evidence that the gillnets or nearshore particulate pollution has affected the distribution of whales.

To test the possibility that an increase in recreational and commercial boats was reponsible for a change in behavior, randomly selected whales in the vicinity of boats were studied. There was no difference in respiration rates or overall swimming speed between these whales and whales unescorted by boats (Sumich 1983). However, whales constantly changed speed and deviated from their course in the presence of boats. There was a significant positive correlation between the number of boats around a whale and the degree of change in course, with the deviation from course being much greater in the presence of recreational boats versus commercial whale watch vessels. Gray whales also sometimes exhibit an evasive behavior, termed "snorkeling", in the presence of a vessel. Snorkeling whales come to an almost complete halt to breathe in an inconspicuous manner. Acoustic pollution may be the factor that results in these behavioral changes. These vessel-induced behaviors might result in greatly decreased migrating efficiency and increased energy consumption by the whales.

Reference: Sumich, J.L. 1983. Swimming velocities, breathing patterns, and estimated costs of locomotion in migrating gray whales, (Eschrichtius robustus), Canadian J. of Zool. 61(3):647-652.

Whale Watching and Killer Whale Occurrence in Greater Puget Sound

- Richard W. Osborne
The Whale Museum

The inland marine waters of Washington State and southern British Columbia create semi-confined conditions for marine mammals, potentially exposing them to the vessel-based curiosity from a large metropolitan area. During the last decade the resident killer whales that seasonally frequent these waters have been subject to intensive field study and, recently, to increasing commercial whale watching and private recreational boat harassment. Additionally, these whales are subject to commercial and sport salmon fishing and an increase in shipping traffic.

To address the impacts of whale watching on these whales, a questionnaire was mailed to 29 companies known to have conducted whale watching programs with these whales. Responses indicate a dramatic increase in whale watching activity and a very large increase in the frequency with which vessels encounter whales. At the same time there has been an increase in the number of orca sightings in the core whale watching area, and while this could be due to an increased sighting effort, it appears to reflect a real increase in the frequency of whales occurring in the core area. Although there is no obvious impact on whale occurrence from these increasing levels of whale watching, further research is warranted. Over the last two years, a reduction in sleep/rest behavior during daylight hours has been observed. An

increase in public education programs and research on the impacts of vessel traffic, and management measures to minimize disturbance from vessels, are recommended.

An Overview of Whale Watching in Hawaii

- Greg Johnston
  Hawaii Whale Watcher

In order for whale watching to be a success in Hawaii, participants will have to adopt a 3-part team concept: 1) Organization and cooperation; 2) Education, focusing on knowledge of laws and regulations, whale behavior, boat driving techniques, sensitivity and respect for whales; 3) Discipline, including self-discipline, peer pressure, and NMFS enforcement with teeth. These must be applied to the commercial and private whale watchers. This formula is applied in Hawaii by involving boat operators, helicopter and airplane pilots, jet ski and parasail companies, and the interested public in a workshop. Before the whale watching season, the workshop is addressed by NMFS personnel and by researchers about laws and whale behavior, and about how to operate a boat near whales. At the end of the season there is a follow-up event to exchange ideas and meet socially.

This formula must also be applied to state and federal government agencies which should use the commercial industry to pursue cases of violations. To better educate the public, more effort must be placed on publicizing the regulations. Whale watching is only one problem for whales. Others are 1) thrill craft, 2) military activities, and 3) commercial shipping.

- Greg Kaufman
  Pacific Whale Foundation

Whale watching in Hawaii is unique because it is based on a tourism industry, not on an off-season fishing industry. In 1988, 80% of 100,000 whale watching passengers in Maui were carried by four companies. Whale watching is also conducted off the main island, Hawaii, and has recently begun off Kauai. Because PWF believes that public education is the key to solving problems, PWF places naturalists aboard vessels and sponsors seminars, and has developed a brochure and posters to combat problems created by uninformed private boaters. Although whale watching is a high-profile industry that targets the whales, it is only one of many impacts that affect the whales.

- Mark Ferrari
  Center for Whale Studies

Whale watching done correctly can be a valuable tool for educating the public. However, "done correctly" means that the whales' needs come first. Harassment is difficult to define because individual whales respond differently to boats. Therefore, approach limits on vessels are the preferred method of preventing disturbance. Thrill craft (including parasails, jet skis, ultralight aircraft) present serious problems for whales. We have seen the virtual abandonment of nearshore areas by resting mothers and calves in the past decade. In the late 1970s, 80.3% of mothers and calves observed were within 0.4 km of shore (within the 10 fathom curve). By the late 1980s, this figure had dropped dramatically to 5.1%. In addition, there are commercial and recreational vessels, dive, snorkel and sailboat charters in the immediate vicinity of the humpbacks. Another potential problem is research activity, and it is recommended that scientific research be scrutinized and limited if necessary. There have already been several workshops focusing on the problems of whale watching in Hawaii, and it has been more than ten years since recommendations were made. These are not new problems, and it is time to set the course for protection of this species.

WHALE WATCHING AND WHALES: SCIENTIFIC PERSPECTIVES

Harassment: Ethics and Definitions

- Charles Mayo
Center for Coastal Studies

The definition of "harassment" is central to any discussion about ethical and management considerations relating to whale watching. The dictionary definition includes "annoy", "worry", and "disturb". NMFS considers it to mean disruption of normal behavior. By the NMFS definition, any change, such as a change in swimming direction in response to a vessel, could be considered to be harassment. The first question, then, is can we determine what is normal behavior, and the second, how can we know whether the whale is being disturbed? Some useful studies to get at these answers are 1) comparison of behavior before and after biopsy darting, which should give some behavioral measure of "normal" and changed behavior and 2) studies of migrating whales to determine deflection from normal swimming paths in response to sound sources.

A third question is whether the current approach -- minimizing short-term immediate disruption of whale behavior — helps us to achieve the ultimate goal of management. Are we merely seeking to control a trivial part of the problem? We need to assess the effects of harassment that bear directly on the success of the population. Question four, then, is how can we know whether our regulation of particular human activities has been successful when many variables may have been at work?

Given all of these uncertainties, my approach with activities that could adversely affect a whale's habitat is conservative; an activity is "guilty until proven innocent" especially when an endangered species is concerned. However, this is not the approach usually adopted for managing whale watching, probably because we believe that this activity has an immense value in terms of education and conservation. Perhaps what we need to do is view whale watching in terms of a balance sheet, in which the positive values are weighed against all of the potential negatives that are as yet unquantified.

Long-term Effects of Whale Watching on Whales

- Peter Tyack
Woods Hole Oceanographic Institution

Rather than trying to regulate all individual acts of harassment defined as changes in behavior, NMFS needs to set management priorities based on studies measuring the long-term impacts of human activity on whale populations. Some behavioral changes are trivial and possibly even beneficial; others may be clearly deleterious. Moreover, some human activities may have serious impacts on whale populations, such as abandonment of critical areas, that cannot be anticipated by focusing on individual acts of harassment. Whales also may change their responses to human activities over decades. For example, by examining log-book entries from research cruises in Cape Cod Bay, it has been possible to analyze changes in the effects of vessels on different whale species (Watkins 1986). These entries have been divided into the pre-whale watching period (1957-1975) and the whale watching period (1976-1982). These data indicate that different species have had different responses to vessels. For example, minke whales shifted their responses from positive

(approach) during the pre-whale watching period to neutral during the whale-watching period. Humpbacks, on the other hand, exhibit more positive responses to vessels during the interval of whale watching than before. The question remains, however, whether "positive" or "negative" behavioral responses are good or harmful for the whales. There is no evidence that any of these interactions with vessels exert a negative long-term impact on the population. Does it make sense for NMFS to regulate vessel interactions before regulating other potentially more serious impacts upon marine mammal populations such as entanglement in fishing gear and effects of marine pollution and habitat degradation?

Reference: Watkins, W. 1986. Marine Mammal Sci. 2(4): 251-262

Responses of Gray Whales to Increased Noise Levels in Mexico

- Marilyn E. Dahlheim
National Marine Mammal Laboratory

There is general agreement among scientists that the acoustical sense of marine mammals, especially that of the cetaceans, constitutes their most important sensory process. Ambient noise levels in the sea (both natural and man-made) may affect hearing abilities or act to inhibit sound production. Coastal habitats often exhibit higher levels of noise than those levels reported for deep, pelagic waters. An acoustically dependent coastal marine mammal must have some way of dealing with the dynamic aspects of ambient noise in the marine environment. The hypothesis is presented that gray whales engaged in acoustical communication circumvent noise in the acoustical channel by the structure and timing of their calls.

Statistical differences were documented in both the acoustical and observed surface behavioral responses of gray whales in the presence of man-made noise. Responses varied depending upon the particular sound source prevalent in the environment. In response to vessels and to playbacks of vessel noise, several changes were observed: 1) an increase was noted in calling rates; 2) received levels of sounds increased; 3) an increase was noted in frequency modulation, number of pulses per series, and repetition rates; and 4) distinct changes in movement, both away from and toward the sound source, were observed. In response to playback of oil drilling noise, calling rates were reduced, direct movements away from the sound source were documented, milling rates decreased, and major changes in distribution and a decrease in local whale abundance were documented. Results similar to those documented during playback of oil drilling sounds were observed in response to playback of killer whale sounds. Although this and other studies suggest that gray whales can cope with certain levels and kinds of noise in their environment, specific types of disturbance and the combined effect of various disturbances may pose a problem for gray whales. Responses of whales may vary depending upon their geographical range or general behavior. Whale responses to noise should not be extrapolated from one species to another.

Avoidance Characteristics of Bowhead Whales and Migrating Gray Whales

- Peter Tyack
Woods Hole Oceanographic Institution

Studies of bowhead whales (Balaena mysticetus) in the presence of vessels revealed that the whales oriented themselves in relation to the vessel only when the engines were on. A significant avoidance response was invoked simply by turning the engine on, even at a distance of 900 m. Bowheads

typically swam rapidly away when boats approached within 2-4 km. Bowheads often began these avoidance responses far enough from the boat that observers on the boat did not see the whale. Individual variability may be the result of changes in responsiveness depending on previous experience with boats.

A study of migrating gray whales (Eschrichtius robustus) examined deviations in swimming direction in response to playback of oil drilling and seismic noises. Gray whales deflected their course to avoid the area where industrial noises were played back. These gray whales tended to avoid areas ensonified by continuous noise louder than approximately 120 dB re 1 micro-Pascal. This behavior is not exhibited unless the received level is approximately 160-170 dB for pulsed sounds such as an air gun.

These responses, and related evidence on humpback whales (see S. Baker, below), point out problems with a management policy focused on avoiding behavioral responses to vessels. First, although this behavioral response of individuals might be interpreted as negative, it could have a positive impact on the population in that the whales would be avoiding the immediate vicinity of industrial activity. Second, because large vessels can invoke strong behavioral reactions from certain whales at distances of several kilometers, management would require much greater regulation of vessel traffic than NMFS has been willing to seek. Protection of habitats and whale populations from cumulative effects of vessels and other human activities is a much more important and sensible goal than preventing short-term behavioral harassment by limiting all vessels to a particular distance.

References:

Malme et al. 1984. Bolt Beranek and Newman Report #5586 (NTIS PB86-218377) to the U.S. Minerals Management Service.

Richardson et al. 1985. Biological Conservation 32: 195-230.

Richardson et al. 1985. LGL report OCS Study MMS 85-0034 (NTIS PB87-124376) to the U.S. Minerals Management Service.

Guidelines: How Well Do They Work for Whales and Whale Watchers?

- Mason Weinrich
  Cetacean Research Unit

Guidelines and regulations were devised to be convenient tools for enforcement purposes, but were formulated without hard data on whale reactions. Our study was designed to determine whether the Northeast Region's guidelines are effective in allowing vessels to watch whales without altering their natural behavior. We also tried to determine what reactions were elicited when a vessel does not follow the current guidelines through either 1) aggressive approaches by the vessel or 2) approaching closer than the 100 foot limit. The study was designed to examine only the effect of a single boat.

Changes in respiration rates and behavior as a reaction to biopsy darting (documented in a previous study) were interpreted to indicate harassment. Although sample sizes were very small, preliminary conclusions can be made. When guidelines were strictly followed, activity and respiration rates remained unchanged. However, both the close approaches and the aggressive approaches elicited some of the "post-biopsy-like" responses. This gives some evidence that the New England guidelines can work. However, lack of enforcement has led to frequent occurrence of both close and aggressive approaches, indicating both greater education and enforcement are warranted.

Behavioral Responses of Humpback Whales to Vessels in Glacier Bay

- Scott Baker
National Cancer Institiute

The behavior of humpback whales summering in southeastern Alaska was observed in the presence and absence of vessel traffic. During the first study year (1981), small and medium size vessels were directed to operate within 400 m of whales according to an experimental plan. The second study year (1982) concentrated on observations of whales during the opportunistic passby of medium and large vessels at distances generally greater than 400 m. Whales showed predictable behavioral responses to vessels operating at distances of less than 4,000 m. Changes in whale behavior were correlated with the speed, size, distance, and numbers of vessels within this proximity. Changes in the whales' respiratory behavior and orientation were the most sensitive indicators of vessel disturbance. Whales responded to the close proximity of vessels by decreasing blow intervals, increasing dive times, and moving away from the vessel's path. Changes in group composition, aerial behaviors, and surface-feeding behaviors were, in general, too infrequent to be a reliable measure of disturbance. At high vessel density, however, occurrences of aerial behaviors were inversely correlated with vessel distance. Detailed case histories indicated that the repeated passby of vessels could result in the temporary displacement of whales from preferred feeding areas. Overall, our observations indicate that humpback whales exhibit a considerable degree of short-term changes in their behavior in response to vessel traffic.

Response of Gray Whales to Whale Watching in San Ignacio Lagoon, Mexico

- Mary Lou Jones
Cetacean Research Associates.
Presented by Steven L. Swartz
Center for Marine Conservation

By the mid 1970s, wintertime whale watching for gray whales in the breeding lagoons of Baja California, Mexico, and particularly San Ignacio Lagoon, became a major industry for excursion companies based in San Diego. Ninety percent of all human activity in the Lagoon was attributable to whale watching conducted from small skiffs launched from large excursion vessels. There was concern that U.S.-based tourism was having a detrimental effect on the whales in their breeding lagoons. In recognition of the importance of San Ignacio Lagoon as a breeding area, Mexico designated it a refuge for gray whales and enacted regulations to manage human activities in the lagoon during the winter whale season.

From 1978 to 1982, we conducted a systematic study of the population of gray whales wintering in San Ignacio Lagoon to determine whether the regulations provided adequate protection for the gray whales. We wished to test the hypothesis that whale abundance, density, and distribution in a) the entire lagoon, b) the nursery, and c) the area utilized by whale watchers were not significantly different on days with and without whale watching vessels in operation. To evaluate long-term effects of exposure to whale watching, demographic trends in the lagoon over the 5 years were examined. Our study found:

1. No change in abundance and distribution of whales in the lagoon on days with and days without whale watching activity;

2. No decrease in gray whale abundance over the 5 years;

3. No decrease in whale abundance within the whale watching area;

4. No decrease in the abundance of female-calf pairs utilizing the upper lagoon nursery;

5. No increase in whale mortality.

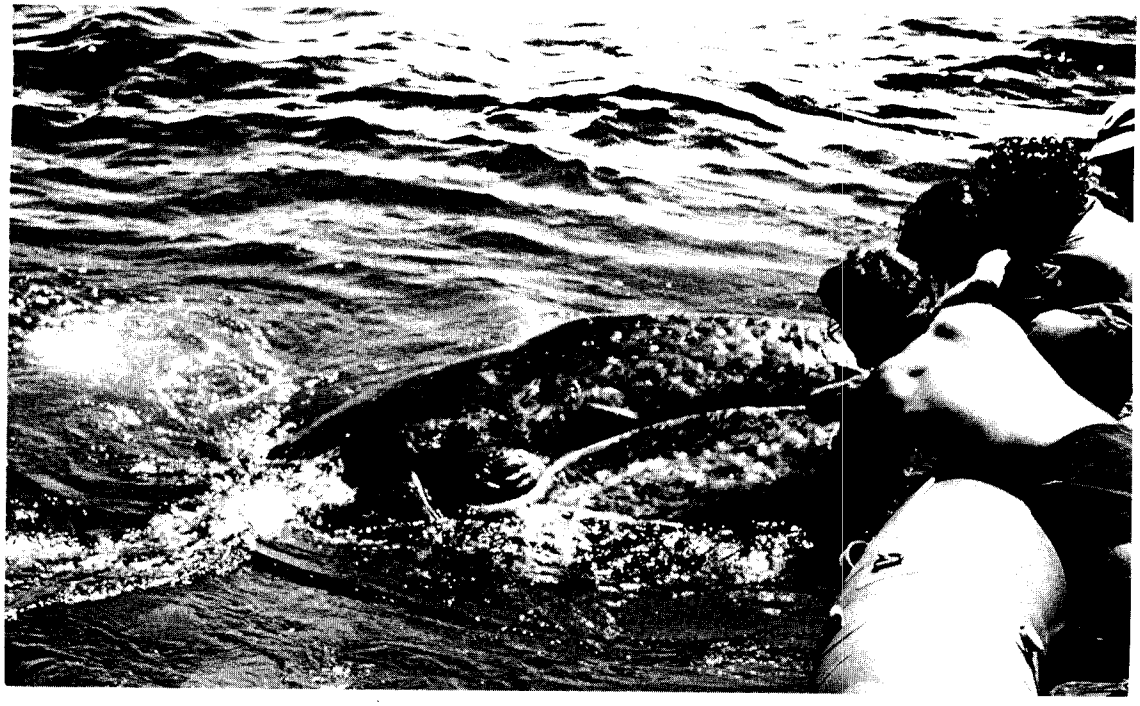
In addition, curious or "friendly" behavior became increasingly common over the 5-year periord. These findings suggest that gray whales have been able to tolerate and perhaps even acclimate to the current levels of human activities within San Ignacio Lagoon. A key factor in maintaining the stability of the whale population may be attributed to the establishment of a refuge where no vessel activity is allowed, and to the regulation of the number of vessels visiting the lagoon. In addition, most skiff operators we observed are generally experienced boat handlers who show respect for the whales. We do recommend, however, that skiffs should keep their engines running at all times, to prevent whales from being surprised by the presence of vessels.

Right Whales and Whale Watching in New England

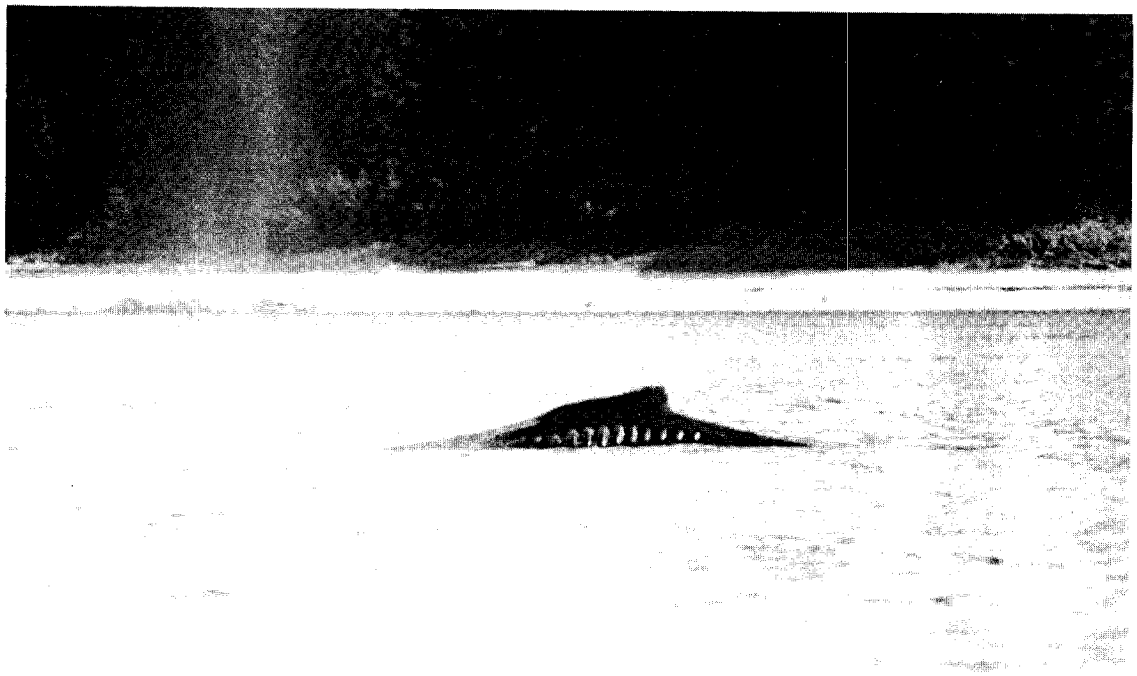
- Scott Kraus
New England Aquarium

Right whales are perhaps the most endangered of all the species subject to whale watching. To assess the impacts of vessels on right whales, we 1) studied the short-term responses of whales to our research vessel, and 2) analyzed the reproductivity of females relative to frequency of encounters with vessels. Short-term responses to vessels were measured using orientation of the whales at first surfacing and at successive surfacings. Preliminary results indicate that both within 100 meters and at distances greater than 100 meters, whales exhibited an orientation at first surfacing away from the vessels. However, orientation at last sighting showed no deviation from randomness. It is possible that this may indicate some degree of habituation to vessels. Such results should be used cautiously, however, because the response of right whales to boats is highly dependent upon antecedent behavior, age, and group size. The reproductive analysis was based on 27 cows that had had at least one calf prior to 1983. There was no significant difference in the number of vessel encounters between cows that had 3 or more calves and cows that had only 1 or 2 calves. Although tne data set is very small, this approach may still be useful for determining impacts of activities on whale populations.

Whale watching itself is probably not a significant problem for right whales in the North Atlantic. Shipping, dredging and military activities all appear to be far more important activities with regard to possible effects on the survival of right whales. One concern, however, is that right whales will become habituated to vessels. Our data indicate that 25% of known mortalities of North Atlantic right whales are due to collisions with ships. A state regulation pending in Massachusetts, which would limit approaches of all types of vessels to 500 meters, may serve as a model for other regulations or legislation.

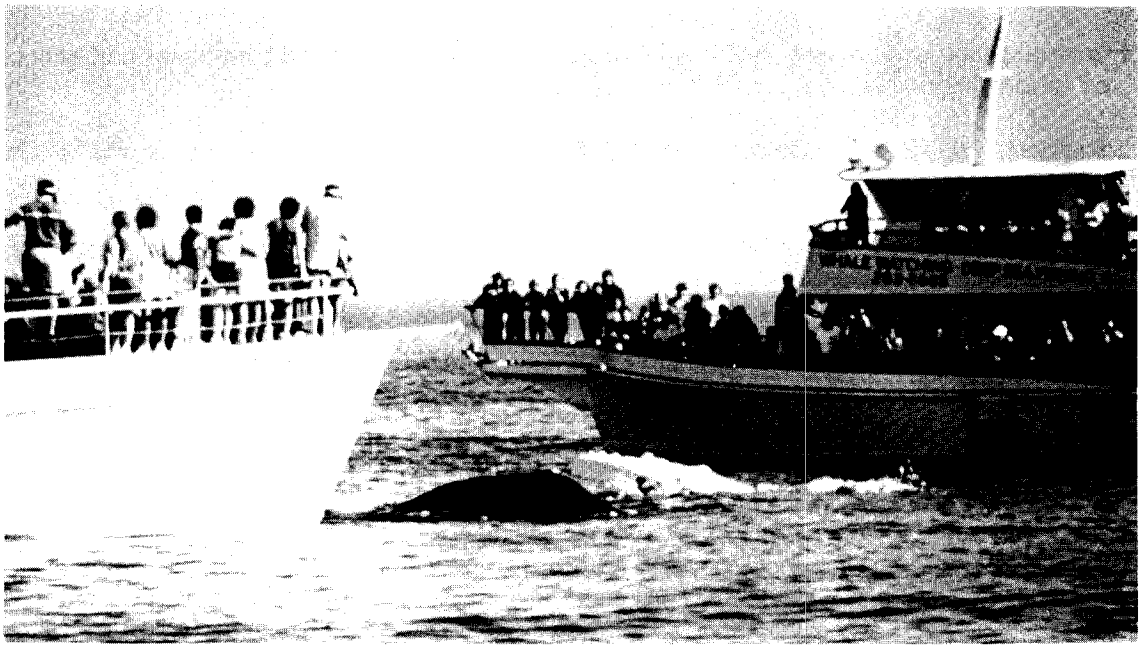


A "friendly" gray whale entertains whale watchers in San Ignacio Lagoon, Mexico. Photo by Steven L. Swartz



Wounds inflicted on a humpback whale from collision with a vessel in southeast Alaska. Photo by Scott Baker, courtesy of Glacier Bay National Park

Helicopter hovering over humpback whale off Maui, Hawaiian Islands. Photo courtesy of NOAA Fisheries



Whale watching on Stellwagen Bank, Massachusetts. Photo by Joel Cook, courtesy of Cetacean Society International

PANEL DISCUSSIONS

REPORT OF THE PANEL ON THE EFFECTS OF WHALE WATCHING

Charles Mayo, Chair
Bob Bowman
Richard W. Osborne
W. John Richardson
Peter Tyack
Gary Vequist

This panel was established to deliberate on the effect of whale watching on whales. It was decided by the panel that our charge was to raise points which should be dealt with in the research and management panels. Further, the panel recognized that its efforts were largely academic and that, as such, it must consider vessel effects irrespective of the activities that take place above the waterline of the vessel. The panel, therefore, considered all effects of vessels and the effects from any other related source of potential disturbance in order to offer a context for research and management decisions. Although the goal of the manager may be to "keep it simple," the panel was compelled to recognize that the effects that arise from vessel disturbance cannot be described simply.

It is particularly important to rank effects in terms of long-term consequences upon endangered whale populations. In order to put potential impacts into perspective, the panel noted the serious consequences of the following human activities:

1. Commercial and sport harvest of whale prey may significantly affect the recovery of endangered whale stocks.

2. Increasing coastal development and vessel traffic may be driving whales from critical habitats.

3. Direct collision with transiting vessels and gear entanglement kill and injure whales each year.

Panel Discussion

The panel discussed which effects should be considered significant, and agreed that these were primarily long-term or ultimate effects resulting in population changes. Such effects are seen as different from, and may not be addressed by studies of the proximate effects of, short-term disturbance and whale reponses. A goal is to protect whales from the following long-term effects (albeit there is no easy way to directly influence or monitor such characteristics as population dynamics):

1. avoidance of habitats and displacement (possible examples: Hawaii; Glacier Bay, Alaska; Laguna Guernero Negro, Mexico, during peak shipping);

2. reduction in fitness of the population in terms of reproductive success and recruitment (no proven cases of changes attributable to disturbance).

It is acknowledged that the ultimate reason for regulation is to avoid, if possible, the long-term detrimental effects on the whales. The study of long-term ultimate impacts is hindered by the difficulty in establishing cause and effect, given the influence of a variety of variables in the marine ecosystem. Smaller scale, proximate effects of disruption may be contributors to long-term detrimental effects, and short-term effects are more easily documented and attributed to specific causes like approaching vessels. However, it is critical that NMFS monitor long-term effects even if it relies upon short-term effects for immediate regulation.

The panel also discussed the usefulness of the definition of harassment as being "altered behavior," and agreed that the focus needs to be on "altered behavior leading to long-term adverse effects", in keeping with the MMPA and ESA. There is a need to take account of a breadth of knowledge on whale ecology and behavior to determine whether an observed change in behavior constitutes an "adverse" effect on survival or productivity.

It was agreed that during vessel approach, whales respond largely to acoustic disturbance. All else being equal, the following clearly will increase the intensity of the effect on a whale:

1. decreasing the distance to the sound source,

2. increasing the number of sources of sound disturbance,

3. temporal variation in the frequency characteristics and amplitude of the sound.

However, loud underwater sound is not the only acoustic condition that should be addressed; vessel type and behavior may also be important. For example, absence of sound coupled with close approaches to whales may result in startle response. "Aggressive" or rapid approaches by a vessel and sudden changes in vessel activity or engine rpm appear to elicit the most dramatic responses from whales. Based on field observations of responses by whales, it appears that certain vessel types may not be appropriate for whale watching in all locations where whale watching may occur. For example, are large cruise ships appropriate whale watching platforms in some places, or might they be inappropriate in certain areas, such as enclosed shallow bodies of water where the physical characteristics of their noise may be amplified, reflected, etc.

The panel then discussed the validity of distance limits in mitigating disturbance of whale behavior. The conclusion was that scientific evidence suggests that sound source levels cannot be converted into no-effect threshold distances without much additional site-specific information about sound propagation and whale responsiveness; the necessary data are not available for most situations of interest. Studies of acoustic effects suggest that universal, absolute distance limits cannot be established if the goal is realistically and uniformly to prevent adverse effects. Such thresholds cannot be established because of variations in:

1. sound source amplitude and frequency (different boats make different sounds);

2. propagation characteristics of sound in the sea because of variations in oceanographic conditions, basin characteristics, and natural temporal variations in sound transmission;

3. species response or sensitivity;

4. responses by whales engaged in different behavior;

5. responses by whales of different demographic classes;

6. responses by whales with different histories of exposure to human activities (habituation and potentiation);

7. predictability and activity pattern of the vessel (sharp changes in frequency and amplitude of sound associated with changes in vessel activities may startle whales).

It was not agreed, but the comment was made, that it seems useful to establish some minimum distance limits for active approaches by vessels, and then perhaps to establish more conservative measures if indicated by the findings of further research on the effects of whale watching. Another comment was made that current evidence indicates that humpback whales in Alaska sometimes respond to vessels at ranges of several kilometers, and that there are few data supporting a closer distance limit.

The panel concluded that there are some useful indicators of short-term effects including:

1. consistent changes in direction of swimming,

2. consistent changes in respiration patterns,

3. increases in dive time/surface time ratio,

4. changes in acoustic behavior (e.g. gray whale response to sound in Baja lagoons),

5. certain surface behavior of whales (e.g. trumpet blows, tail slashes, hard tail flicks, or other known indicators of agonistic behavior).

Single observations of these types usually are not conclusive evidence of disturbance given the natural variability in whale behavior, but consistent changes in behavior along these lines can be taken as evidence of disturbance.

It was noted that the specific indicators will likely vary with all of the previously identified variables.

Modeling population biology and energetics of whales using data on short-term effects may yield answers regarding long-term effects. Long-term effects will always need to be studied in order to test these models.

<u>Effects of vessels on whales that should be addressed by the research panel</u> (listed by priority):

1. In order to evaluate the long-term consequences of individual acts of disturbance, there is a need to study potentiation, habituation, cumulative effects over time, and synergisms among several sources of disturbance (e.g. effects of multiple vessels).

2. Develop methods (controlled experiments) to directly or indirectly measure stress in whales in response to disturbance. "Implantable" instrumentation such as radio-tags and observations from shore or passive platforms could be used to evaluate heart rate and overt changes in behavior, respectively.

3. The long-term effects of human activities on whales should be evaluated, as possible, with modeling techniques using available information on energetics, behavior, and other resource requirements. If nothing else, this approach may identify where adequate scientific data are lacking, and thus establish a direction for future research.

4. Establish, through study, baseline acoustic (noise) profiles in representative habitats where whale watching activities occur.

5. Research to characterize geography, oceanography, and species involved in focal whale watching areas is needed to permit the development of whale watching regulations that are individually tailored to particular species in particular regions.

Areas of comment that should be addressed by the management panel:

1. Are some vessels inappropriate for whale watching?

2. Suggestion: When the sounds that do and do not affect whales significantly have been defined, limit sound production in critical whale habitats, and monitor attainment of the goal. It is further suggested that, once the necessary data are available, the management panel consider developing regulations that require whale watching vessels to meet some acoustic standard.

3. Restrictions on whale watching must be tailored to each region, taking into account the nature of the whale watching activities, the geography, the class/type of vessels involved, and the species of whales involved.

4. Agreed: In general there currently are not, from the point of view of effects, valid arguments to curtail whale watching. Exceptions would be in the case of a detrimental impact on critical activities such as breeding or feeding. Other unregulated marine activities may more seriously affect whales. It was also observed that, while whale watching is often acknowledged to have a "positive" impact on the public and consequently on the whales, this is not always the case. The recommendation to the management panel is to consider guidelines to improve the educational aspects of whale watching.

5. To reduce the possible detrimental effect of multiple sources of disturbance, it was recommended that the management panel consider that vessel activity near whales might be limited to one source of potential disturbance at a time, pending new information on the effects of multiple sources of disturbance.

6. The panel collected information from participants in the workshop regarding certain activities related to whale watching that should be regulated pending resolution of uncertainties. Members of the audience suggested the following:

   a. whale watching involving feeding of cetaceans (and pinnipeds) in the wild;

b. skin and scuba diving directed at whales;

c. whale watching from helicopters;

d. use of thrill-craft, parasails, and wind surfers near whales;

e. use of cruise ships above a certain size for whale watching;

f. whale watching on particular individuals (e.g. cow/calf pairs), or during critical activities (e.g. calving, courtship and mating);

g. the underwater playback of sounds (biological or non-biological) not authorized by scientific research permit.

REPORT OF THE RESEARCH PANEL

Steven K. Katona, Chair
Scott Baker
Marilyn Dahlheim
Paul Forestell
Debbie Glockner-Ferrari
Scott Kraus
Hans Neuhauser

I. We encourage whale watching vessels to collaborate in research efforts as appropriate, by giving research space to professionally recognized and qualified scientists and naturalists, helping to fund research, and/or other actions for the benefit of the whales and our understanding of their needs.

II. We note that the replication of research is an important part of the scientific process for studying long-lived species, but also recognize that unnecessary duplication of research, especially potentially disruptive research on endangered whales, is undesirable.

III. We recommend that research be continued or undertaken in at least the following areas:

A. Effects of whale watching should be examined directly from whale watching vessels, when and where possible, and indirectly from other independent platforms. Research should be carried out to:

1. Determine short-term behavior changes as indicators of disturbance.

2. Develop techniques for monitoring physiological indicators of stress.

3. Quantify the effects of acoustic disturbance, including multi-vessel effects and the relationship between underwater noise levels and whale response.

4. Correlate trends in population parameters (abundance, distribution,

density, and production) with exposure to whale watching (or other) vessels, while considering other influential factors.

5. Quantify energy expenditures or time devoted to avoiding sources of disturbance, relative to total energy budgets, to estimate any energetic costs to the whales associated with whale watching activities.

B. Long-term monitoring is needed for species and populations subjected to whale watching.

1. Obtain reliable estimates of population size, mortality, and reproductive characteristics for species and populations subjected to whale watching, for comparison with undisturbed populations.

2. Document and monitor distribution trends for local areas and populations.

3. Investigate habituation or other changes in behavior that could result from long-term exposure to whale watching.

C. Long-term studies are needed to determine whether whale watching affects habitat quality, and, also, to determine whether other changes in habitat could be affecting whale watching. (The panel discussed briefly how coastal communities might be affected if whales abandoned their habitat.)

1. Identify critical areas or environmental processes (e.g. frontal concentration of copepods on a microscale in Cape Cod Bay) potentially altered by whale watching.

2. Provide long-term monitoring of factors such as ambient sound levels, amount and type of vessel traffic, prey abundance, turbidity, and marine debris, relative to whale watching activities and as an aid to long-term research on habitat quality.

D. Sociological studies are needed to evaluate and/or improve the performance of all people involved in whale watching. The panel notes that there is an implicit assumption that whale watching is educational and therefore ultimately of benefit to the whales. The panel therefore recommends that sociological research attempt to evaluate this assumption. We suggest that input should be solicited from sociologists, environmental educators, and others knowledgeable in human behavior and environmental concerns. We encourage the continuation of educational and interpretive programs and further research in the following areas:

1. Determine the education and conservation value of whale watching and interpretive programs; identify expressed behavior and attitude changes in the whale watching public; evaluate and improve educational programs and materials.

2. Quantify economic benefits of whale watching and associated activities, along with benefits of continuing those activities on a long-term basis.

3. Determine the effectiveness of guidelines, regulations, enforcement programs, and evaluate disseminated literature describing all of the above.

IV. Immediate research priorities should be species, locations or situations of particular significance or need. This includes:

A. small populations subjected to whale watching, such as right whales in the northeast U.S., killer whales in the Pacific Northwest, and belugas in the Gulf of Saint Lawrence;

B. breeding habitats, such as the southeast coast of the United States for right whales, Hawaii and the Caribbean for humpback whales, and the lagoons of Mexico for gray whales;

C. areas identified as critical to significant numbers of whales for key activities such as feeding.

REPORT OF THE MANAGEMENT PANEL

Charles Karnella, chair
Aaron Avellar
Doug Beach
Diana McIntyre
Ray Sautter
Margie Stinson
Richard Ternullo

Focus of the panel: What should NOAA Fisheries do about whale watching?

The panel discussed the tools that the Federal Government has to manage endangered species.

I. Endangered Species Act (ESA)

Under this Act, regulations can be published that establish conservation measures such as a limit on take and minimum distance. The Act allows scientific research permits/exemptions, but these are limited to research designed to gain more information on the species. When critical habitat is designated for a species, special rules can be established for these specific areas. For Federal activities that may affect endangered species of whales, a Section 7 consultation with NMFS is required. Consultations consider the adverse effects of human activities on threatened or endangered species.

II. Enforcement

Under the Endangered Species Act and the Marine Mammal Protection Act (MMPA), the harassment of a species is a take, and a take is illegal unless an exemption has been granted. (The MMPA defines "take" as "harass, hunt, capture, or kill, or attempt to harass, hunt, capture or kill any marine mammal." In the ESA "take" is defined as "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct"). However, agents have a difficult time making a harassment case in all but the most obvious instances.

A suggestion was made to use criteria such as noise or an acoustic profile to determine harassment. The management panel believed this would be difficult to enforce

because enforcement agents would need equipment to measure the acoustic profiles of vessels. Vessel distance and vessel activities are the best available tools that enforcement agents have to monitor harassment and make strong cases for violations. It was suggested that in areas where NMFS managers deem it necessary, regulations should be issued that establish a minimum distance from whales.

If researchers and commercial whale watchers see an activity they believe is illegal, they should provide NMFS enforcement agents with as much information as possible. However, some reseachers and whale watchers believe that information submitted in the past has not been used.

The panel discussed what limits should be placed on divers, swimmers and aircraft. For aircraft, limits such as being no lower than 1,000 feet over a whale and within 1/4 mile horizontally were suggested.

III. Whale Watching Programs

A good whale watching program should include an educational component that would present a national as well as a regional thrust. The national element should focus on the media that reach the private boating public, including boat registration material, boat shows and boating magazines. The regional thrust would include distributing colorful brochures concerning the responsiblities of whale watching, taking part in boat shows, posters at marinas, public service announcements, explaining regulations at the beginning of each whale watching trip, and making presentations at local schools.

The panel emphasized that we should not underestimate what the public can do to help if they are educated. The panel also questioned whether whale watching is an educational experience only when commercial whale watching trips are involved.

IV. Permit Program

Scientific research permits from NMFS include conditions regarding photography and commercial and documentary use of film taken during the research. It is also NMFS policy to condition permits for scientific research on whales by not allowing the research activities under the authority of the permit to be conducted from a vessel engaged in commercial whale watching.

The panel suggested that NMFS more closely scrutinize film crews operating under research permits, and that permits for research have stricter criteria to evaluate the benefits of research to the species.

While the participants encouraged monitoring and observations by researchers on board whale watching vessels, (an activity that does not require a scientific research permit as long as guidelines or regulations for approaching whales are observed), there was concern voiced that some holders of research permits were conducting research from a vessel engaged, at the same time, in commercial whale watching. This could give the commercial whale watching vessel an advantage over other boats because scientific research permits usually allow a closer approach to whales than guidelines or regulations for whale watching. Because of Regional differences in the distance limitations, however, this is not always the case. In some Regions commercial vessels are presently allowed to approach whales to a distance that, in other Regions, would necessitate obtaining a research permit.

Several preliminary suggestions were made by the panel regarding management of whale watching. These included restricting access to whales by establishing a minimum approach distance, but allowing special approach procedures that would allow permitted commercial whale watching vessels to approach closer to whales than private boaters. Under this scenario, commercial whale watch operators would have to meet certain requirements, including, possibly, skipper qualifications, carrying a qualified naturalist, providing a public education program, and displaying a permit which could be revoked by NMFS enforcement agents if a violation occurred. In addition, special regional restrictions would be included. Authorization, which would come from the Federal government, would be at no cost to the commercial vessels.

During discussion of these preliminary recommendations, it became clear that most participants were not in favor of allowing licensed whale watchers to approach closer to the whales than the general public. Objections to this proposal centered on the hostility that would be generated and the difficulty of enforcing a dual standard. There was some discussion about whether whales were a resource that private boaters also had a right to enjoy. In addition, some participants expressed the belief that if a minimum distance were necessary to protect the whales, it should be applied uniformly. There were also questions raised about the legality of such a system with a dual standard and whether a legislative change in the MMPA and the ESA would be required.

The panel's final recommendations did not include the industry program. However, some industry representatives stated their intention to form an industry group that would be self-policing.

The consensus of the group was that restrictions should be in the form of regulations rather than guidelines because regulations are more enforceable. The panel and most participants thought that they should be site-specific, although several preferred a national regulation that would specify a minimum distance rather than regional regulations. There was further discussion about the usefulness of arbitrary limits which do not necessarily address the effects of vessels on whales. The prevailing opinion, however, was that it is better to set minimum distance limits, which are workable from the viewpoint of management and enforcement, than to continue present policy.

In addition, participants discussed the impact on the whale watching industry and on research conducted from a whale watch vessel if the minimum approach limit is too great.

Based on the discussion of the panel's preliminary recommendations, the panel modified its recommendations:

Short-term Recommendations

I. Regulations

A. Establish a minimum approach distance for vessels, aircraft, and people, by Region and by situation in each Region. Proposed regulations should provide explanations for the distance limitations, such as why the distance in one Region might be greater than in another Region for the same species, or why in the same region there might be different distance limitations for different species.

B. Develop regulations in coordination with appropriate constituents.

C. Review periodically as new information is developed, and revise as appropriate.

D. Regulations should address other activities that result in obvious harassment (e.g. pursuit, diving on whales, swimming with whales).

E. In some cases the regulations may need to address the size of a whale watching vessel (such as cruise ships).

II. Enforcement

A. NMFS should increase enforcement effort above its current level during the whale watching seasons.

B. The role of the states and other Federal agencies should be evaluated.

C. NMFS should solicit reports on violators from other whale-watching and research vessels.

III. Education

A. Develop an educational program with industry, the conservation community, scientists, and others that has both a national and regional focus.

B. A national public education effort would include articles written for magazines and other media that reach the private boating public.

C. A Regional approach would include distribution of colorful, easy-to-read brochures. The development of Regional programs should be coordinated with local industry and the conservation community.

IV. Whale watching and scientific research permits

Recognizing that not all scientific research requires a permit from the Service, NMFS should investigate whether holders of scientific research permits are conducting research from vessels that, at the same time, are engaged in commercial whale watching, and whether the privileges of a permit are being abused to benefit the permit holder monetarily.

Long-term Recommendations

The Federal government should develop a comprehensive whale watching program that would include the following:

A. A mechanism to ensure cooperation between the whale watching industry, marine mammal researchers, consevation groups and other interested parties.

B. A review of the feasibility and usefulness of establishing a licensed Whale Watching Industry Program

C. Utilization of information that will be developed from the short-term recommendations including the results of new research, regulations, and enforcement efforts.

FINAL RECOMMENDATIONS OF THE WORKSHOP

I. The whale watching industry should expand its collaboration with researchers by providing space for qualified scientists and naturalists and by providing funding for research.

II. The research community should direct its attention to studying the short-term and long-term effects of whale watching on individual whales, whale populations, and whale habitats. Immediate research priorities should be species, locations or situations of particular significance (See Report of the Research Panel.)

III. The conservation community should evaluate, and improve or expand where necessary, educational programs and materials on whale watching. (See Report of the Research Panel.)

IV. Each NMFS Region should issue regulations on whale watching.

A. Primary focus of new regulations should be minimum approach distances based on Regional considerations. (See Short-term Recommendations in Report of Management Panel.)

B. Include in regulations restrictions on related activities, including thrill craft, swimming and diving with whales.

C. The regulations should address behavior, such as how to operate a vessel if a whale approaches the vessel, as well as distances.

D. The regulations should provide special restrictions, as warranted, for particular areas, such as feeding or calving grounds, or special situations, such as whale watching on mating pairs or cow/calf pairs.

E. The regulations should include a prohibition on whale watching activities that involve the feeding of wild populations of cetaceans.

V. The current Permit Review in the Office of Protected Resources (NMFS) should examine the use of scientific permits for commercial whale watching purposes, including photography.

NMFS recognizes that commercial whale watching vessels provide an important platform for conducting research on whales. Not all research activities on whales require a permit from the Service. NMFS should investigate whether scientific research that requires a permit is being conducted concurrently with commercial whale watching trips and whether the privileges of a permit (which usually allow a closer approach to whales than whale watching guidelines or regulations) are being abused to benefit the permit holder monetarily. NMFS should clarify under what circumstances it is acceptable to combine research with commercial activities.

VI. By January 1, 1990, each NMFS Region shall have met with affected constituencies and drafted proposed regulations on whale watching for that Region.

SUMMARY

Whale watching has become an important economic, recreational, educational and, in some cases, scientific activity. There is still much disagreement about the extent to which whale watching is an activity harmful to the whales themselves. Although other, and perhaps greater, threats to whales and their habitats have been identified, most participants in the workshop believed that better protection of whales would be achieved relatively easily if whale watching were better regulated. The emphasis was on regulations that would be simple to understand, follow, and enforce. It was therefore agreed that minimum approach distances were required. However, because of the variability from region to region in factors such as species of whale, numbers and types of vessels, or importance of the area for feeding or breeding, participants stressed the need for the regulations to be specific to each NMFS Region. A major concern was the difficulty of ensuring compliance by private boaters. Workshop participants therefore concurred that new regulations need to be combined with a vigorous public education effort.

APPENDICES

APPENDIX A

Workshop Agenda

14-16 November 1988
Monterey, California

13 November 7:30 p.m. Reception at Monterey Bay Aquarium in conjunction with the American Cetacean Society

DAY ONE: 14 November

08:00 Registration for Participants

08:30 Welcome and Opening Remarks: Steven L. Swartz, Center for Marine Conservation (CMC)

INVITED PRESENTATIONS

Moderator: Steven L. Swartz, CMC

THE VIEW FROM NATIONAL MARINE FISHERIES SERVICE (NMFS)

08:40	Charles Karnella NMFS, Washington, DC	Purpose and Objectives of the Workshop
09:00	Martin Hochman NOAA General Counsel	Legal Responsibilities Regarding Whale Watching

09:20 Regional Perspectives

For each region:

1. What are the unique characteristics of whale watching in the region?
2. What has been the traditional management approach?
3. Has that approach been successful?
4. What specifically need to be addressed to maintain a successful management program?

Speakers:

Jim Lecky	NMFS-Southwest Region
Doug Beach	NMFS-Northeast Region
Eugene Nitta	NMFS-Pacific Area Office
Steve Zimmerman	NMFS-Alaska Region
Sally Mizroch	NMFS-Northwest Region
Charles Oravetz	NMFS-Southeast Region

10:30 Coffee Break

Day One: 14 November Continued

WHALE WATCHING PROGRAMS AND CONCERNS

11:00	Tom Lewis American Cetacean Society-L.A.	Public Education Programs
11:20	Leslie Shields Cetacean Society International	Public Education and Whale Watching
11:40	Gary Vequist and Marvin Jensen National Park Service	Whale Watching in Southeast Alaska
12:00	Lunch Break	

Continuation of Invited Presentations

Moderator: Charles Karnella, NMFS Washington D.C.

14:00	Brian MacDonald and Doug Hall New England Aquarium	Public Education Programs
14:20	Irene Osterman Island Packers, Inc.	Channel Islands Interpretive Programs
14:40	Phil Clapham Center for Coastal Studies	Whale Watching and Data Collection
15:00	Coffee Break	
15:20	Margie Stinson Fisherman's Landing	Baja Lagoon Whale Watching Programs
15:40	Jim Douglas Cape Ann Whale Watch	New England Whale Watching
16:00	Mike Bursk Dana Wharf Sportfishing	Response of Whales to Whale Watching in Southern California
16:20	Richard Osborne The Whale Museum	Whale Watching Trends and Killer Whale Occurrence in Greater Puget Sound
16:40	Summary and Adjourn for Evening	

DAY TWO: 15 November

Continuation of Invited Presentations

Moderator: Sally Mizroch, NMFS National Marine Mammal Laboratory

09:00	Greg Johnston Hawaii Whale Watch	An Overview of Whale Watching in Hawaii
	Greg Kaufman Pacific Whale Foundation	
	Mark Ferrari Center for Whale Studies	

WHALE WATCHING AND THE WHALES: SCIENTIFIC PERSPECTIVES

09:20	Charles Mayo Center for Coastal Studies	Harassment: Ethics and Definitions
09:40	Peter Tyack Woods Hole Oceanographic Inst.	Long-term Effects of Whale Watching on Whales
09:55	Marilyn Dahlheim National Marine Mammal Laboratory	Responses of Gray Whale to Increased Noise Levels in Mexico
10:10	Peter Tyack Woods Hole Oceanographic Institution	Avoidance Characteristics of Bowhead Whales and Migrating Gray Whales
10:20	Mason Weinrich Cetacean Research Unit	Guidelines: How Well Do They Work for Whales and Whale Watchers?
10:40	Coffee Break	
11:00	Scott Baker National Cancer Institute	Behavioral Responses of Humpback Whales to Vessels in Glacier Bay, Alaska
11:20	Steven L. Swartz Center for Marine Conservation	Response of Gray Whales to Whale Watching in San Ignacio Lagoon, Mexico
11:40	Scott Kraus New England Aquarium	Right Whales and Whale Watching in New England
12:00	Lunch Break	

PANEL DISCUSSIONS

Moderator: Steven L. Swartz, CMC

13:30 EFFECTS OF WHALE WATCHING ON WHALES: Chair - Charles Mayo

15:30 Coffee Break

16:00 RESEARCH PROGRAMS AND NEEDS: Chair - Steve Katona

18:00 Adjourn for Dinner

Panel members meet to formulate recommendations from discussions

DAY THREE: 16 November

PANEL DISCUSSIONS CONTINUE

Moderator: Natasha Atkins, CMC

09:00 MANAGEMENT CONSIDERATIONS: Chair - Charles Karnella

10:30 Coffee Break

MANAGEMENT PANEL SUMMARY: Charles Karnella

12:00 Lunch Break

Panel members meet to formulate recommendations from discussions

SUMMARY DISCUSSION

Presentation of Panel Discussion Findings

Moderator: Steven L. Swartz, CMC

14:00 Effects Panel Report: Charles Mayo

14:10 Research Panel Report: Steve Katona

14:20 Management Panel Report: Charles Karnella

15:00 Open Discussion of Recommendations and Conclusions from Panels

16:00 Workshop Adjourned

PANEL NO. 1: THE EFFECTS OF WHALE WATCHING ON WHALES

1. Do we have an ethical responsibility to question whether we should undertake whale watching programs: do such programs improve the situation for endangered species, or do programs make their situation worse? If so, how?

2. How are whales affected by whale watching? What evidence is there that whale watching has had, is having, or may have adverse effects on whales (e.g., altered behavior, abandonment or avoidance of preferred feeding/breeding areas, interference with breeding and feeding, etc.)?

3. How do the effects of whale watching vary by whale species, age/sex, and times of the year?

4. What are the critical uncertainties regarding the impact of whale watching on whales and their habitats?

5. Are there activities that should be restrained pending resolutions of uncertainties, and should there be specific whale watching measures for each whale species, region, and season?

6. How can research resolve uncertainties regarding the effects of whale watching on whales? What research is needed?

Panel Members: Charles Mayo, Chair
Bob Bowman, Maine Whale Watch
Richard Osborne, The Whale Center
John Richardson, LGL Ecological Consultants
Peter Tyack, Woods Hole Oceanographic Inst.
Gary Vequist, National Park Service

PANEL NO. 2: RESEARCH PROGRAMS AND NEEDS

1. We have some information on the effects of whale watching on whales. Is this information useful? What gaps in our knowledge remain?

2. How can further research fill these gaps? Can whale watching vessels/programs be used for necessary research? Are independent research efforts needed?

3. What problems stem from combining commercial whale watching with research? Are there significant limitations on the types or quality of information that can be obtained? Can such a combination lead to abuses?

4. Some measures (e.g. guidelines) have been developed to mitigate the impacts of whale watching. How can research help to develop such measures, and how can research evaluate the effectiveness of such measures?

5. Should whale watching vessels be organized to carry out dedicated studies one or two days each year or season (similar to the Audubon Christmas Bird Count)? If so, what types of studies would be most useful?

6. Given the answers to 1-5, what types of studies should be given priority attention? How might these studies be accomplished?

Panel Members: Steve Katona, Chair
Scott Baker, Smithsonian Institution
Marilyn Dahlheim, NMFS Marine Mammal Laboratory
Paul Forestell, Pacific Whale Foundation
Debbie Glockner-Ferrari, Center for Whale Studies
Scott Kraus, New England Aquarium
Hans Neuhauser, The Georgia Conservancy

PANEL NO. 3: MANAGEMENT CONSIDERATIONS

1. What kinds of whale watching activities need to be managed to prevent possible adverse impacts of whale watching on whales?

2. What mandatory and voluntary programs and steps have been taken to reduce the impacts of whale watching on whales (Federal, State, private)? Can they be enforced, and do they support the objectives of a management program for whale watching?

3. What if any additional steps are necessary or desirable, and how might these additional measures best be implemented (e.g., through Federal regulations, voluntary compliance, guidelines, directed public education programs, etc.)?

4. Should whale watching be a permitted activity? Should there be performance requirements for operators (training)? Should education programs/natural history components/naturalists be required?

5. Can education programs create an awareness of whale watching concerns that will help to "manage" the public and industry, or allow the public and industry to "police" themselves?

Panel Members: Charles Karnella, Chair
Aaron Avellar, Dolphin Fleet
Doug Beach, NMFS, Northeast Region
Diane McIntyre, American Cetacean Society
Ray Sautter, NMFS, Southwest Region
Margie Stinson, Fisherman's landing
Richard Ternullo, Sam's Sportfishing

APPENDIX B

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14-16 November 1988 Monterey, California

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APPENDIX C

Summary of Actions Taken by NOAA General Counsel
on Whale Harassment Cases in California and Hawaii

California Cases

CASE NAME	PENALTY	DESCRIPTION OF CASE	DATE OF VIOLATION
Tew	$800.00	Whale harassment with inflatable boat on two different dates. $400 each count. $400 paid $400 suspended	01/05/85
Toensmeyer	$400.00	Attempted to harass "Humphrey" the humpback whale in Sacramento River. Settled for $200.	11/03/85
Muller	$400.00	Whale harassment by aircraft at Pt. Reyes. Settled for $300.	01/25/86
[a person]		Whale harassment by whale watch boat off Pt. Reyes. Prosecution declined for insufficient evidence.	01/10/87
[a person]		Whale harassment by powered sailboat off San Diego. Prosecution declined for insufficient evidence.	02/01/87
Weis	$600.00	Whale harassment off San Diego in Zodiac. Full amount being collected.	02/01/87
[a person]		Whale harassment off Pt. Reyes in inflatable motor boat. Prosecution declined for insufficient evidence.	03/28/87
Barach	$600.00	Gray whale harassment by small pleasure craft witnessed by whale watch vessel "OCEANSIDE 95." Settled for $300.	01/31/88

Morina	$600.00	Gray whale harassment with sailboat under power, SCOTIA MIST, near Oceanside. $450 settlement.	01/31/88
Williams	$600.00	Recreational power boat, COASTBUSTER, harassed three northbound gray whales near Palos Verdes Peninsula. Awaiting hearing.	02/13/88

1988 Hawaii Humpback Whale Distance Violation Cases *

RESPONDENT	FACTS	ACTION TAKEN
[a person]	1/18/88: Operator of small sailboat possibly within 50-100 yards of humpbacks - Maui	Dismissed - insufficient evidence
Guido Kai Kanani, Inc.	2/15/88: Commercial whale watch boat came within 35-40 yards of humpbacks - Maui	NOVA issued for $400; settled for $200
Olandesi	2/21/88: Operator of small private boat came within 40 yards of humpbacks - Maui	NOVA issued for $250
Priodhorsky	2/8/88: Operator of small boat came within 20 yards of humpbacks - Maui	NOVA issued for $250; settled for $187
Russell Iconoclast, Ltd.	2/18/88: Charter fishing boat came within 30 yards of humpbacks in 300 yard zone - Maui	NOVA issued for $400
Troxel	3/6/88: Private boat within 50 yards of humpbacks - Maui	NOVA issued for $250
Turner	1/24/88: Kayak within 25-30 yards of humpbacks in 300 yard zone - Maui	NOVA issued for $250; settled for $187

* Penalties for these cases were assessed at one-half the normal amount because 1988 was the first year of the distance regulations.

1986 Hawaii Humpback Whale Cases

RESPONDENT(S)	FACTS	ACTION TAKEN
[a person]	2/2/86: Operated sea kayak within approx. 100 feet of humpback whale in Maalaea Bay, Maui. No evidence of harassment.	Dismissed
[a person]	2/1/86: Operator of commercial whale watch vessel made several approaches to humpbacks in Maalaea Bay, at times within 80 years. No evidence of harassment.	Dismissed
[a person]	1/19/86: Master of the cruise ship S.S. INDEPENDENCE changed course to observe humpback whales off Maui. Approached whales but no evidence of harassment.	Dismissed
[a person]	2/9/86: Boat operator approached to within approx. 50 feet of 6-7 humpbacks in Maalaea Bay. No evidence of harassment.	Dismissed
[a person]	1/19/86: Pilot of sightseeing helicopter hovered over a humpback whale at altitude of 100-500 feet, off Maui. No evidence of harassment.	Dismissed

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1977-1985 Hawaii Humpback Whale Cases

RESPONDENTS	FACTS	ACTION TAKEN
[a person]	2/9/85: Two men in sea kayaks approached within 30 yds. of several whales off Maui, attempting to photograph them. No evidence of harassment.	Dismissed
[a person]	2/3/85: Private boat followed 5 whales off Maui for 30 minutes, approaching within 20-80 yds. No evidence of harassment.	Dismissed

[a person]	3/27/84: Sailboat approached within 20 yds of 2 adults off of Diamond Head. No evidence of harassment.	Dismissed
[a person]	2/5/84: Private boat approached one adult very closely. No evidence of harassment.	Dismissed
Cremer	1/22/84: Private boat approached within 20 yds. of 2 adults and a calf in Maalaea Bay; harassment observed.	Warning issued
Brown	1/18/84: Private boat circled within 30-40 yds of adult and calf off Maui; harassment observed.	$400 penalty assessed; case settled for $300
[a person]	2/23/83: Sailboat approached close to adult and calf in Maalaea Bay. Observed from about 1 mile away through spotting scope. No evidence of harassment.	Dismissed
[a person]	2/16/83: Commercial whale watch vessel followed within 60-70 yds. of 2 adults for 10 minutes. No evidence of harassment.	Dismissed
[a person]	2/8/83: Small skiff approached within 70-80 yds of several whales off of Lahaina. No evidence of harassment.	Dismissed
[a person]	4/21/82: Sailboat closely followed adult and calf in Maalaea Bay. No evidence of harassment.	Dismissed
Lee Kenai Air	3/8/82: One adult humpback whale harassed by low-flying helicopter off Hana, Maui.	$400 assessed against pilot and company; each settled for $100
Bechtel	3/13/81: Commercial whale watch vessel approached humpbacks off Lahaina; harassment observed.	Warning issued

Baldwin	3/8/81: Scuba instructor swam out from dive boat toward an adult and calf in Maalaea Bay. Left area a short time later.	Warning issued
[a person]	2/26/80: Sailboat approached close to 6-8 whales in Auau Channel, off Maui.	$400 assessed; case dismissed
Seskevics	4/11/79: Hobie cat sailed around 2 whales in Maalaea Bay. Harassment observed.	$100 assessed; case settled for $50
Sweaney Western Helibirds	12/1/77: Low flying helicopter harassed an adult and calf in Maalaea Bay.	$1600 assessed; case settled for $800
Hudnall	1/14/77: Two persons in a Zodiac chase and cut off pod of 5-6 whales and approach within 80 yds. in Maalaea Bay.	$1000 assessed; case settled for $150

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1985 Hawaii Dolphin Cases

RESPONDENT	FACTS	ACTION TAKEN
Stewart	9/11/85: Jet skier chased approx. 50 dolphins near Kaui.	NOVA issued for $400; settled for $300
Taylor	8/12/85: Operator of commercial whale watch vessel chased approx. 50-60 dolphins near Lanai.	NOVA issued for $500; settled for $375

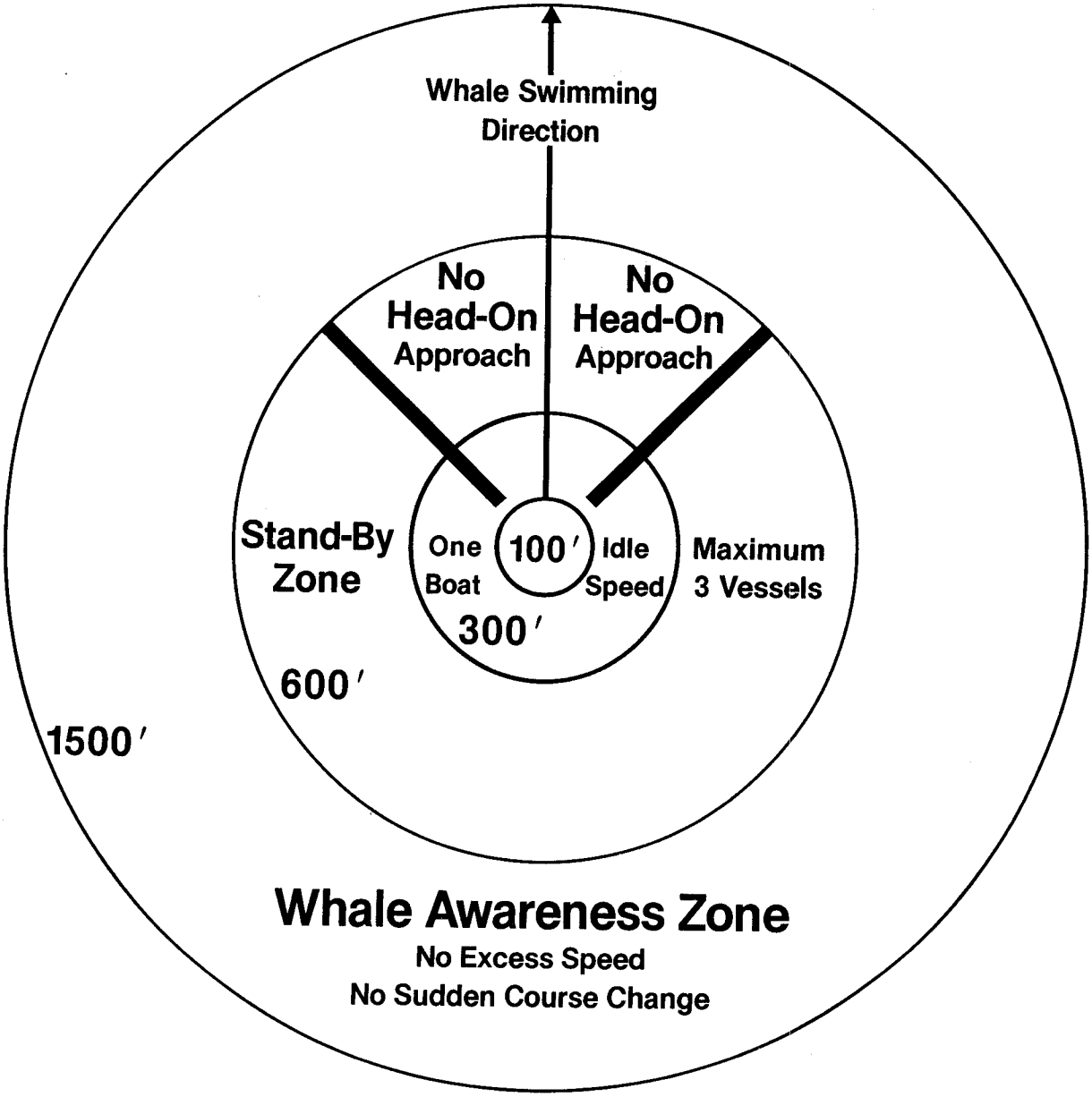

Diagram of New England Whale Watching Guidelines

APPENDIX E

Interim Rule on Approaching Humpback Whales in Hawaiian Waters

DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

50 CFR Part 222

[Docket No. 61096-7191]

Endangered Fish and Wildlife; Approaching Humpback Whales in Hawaiian Waters

AGENCY: National Marine Fisheries Service (NMFS), NOAA, Commerce.

ACTION: Interim rule with request for comment.

SUMMARY: NOAA is issuing an interim rule that prohibits aircraft from approaching closer than 1,000 feet from a humpback whale, and prohibits vessels or people from approaching closer than 100 yards from a whale except in cow/calf areas where the approach limit for persons and vessels is 300 yards. Because additional restrictions on cow/calf areas have been added in response to comments received on the proposed rule, NOAA is requesting further comment. This rule applies to all persons and vessels operating within 200 miles of the Hawaiian Islands. This action is necessary to reduce the level of disturbance experienced by humpback whales from vessel traffic.

DATES: The interim rule becomes effective on December 23, 1987. The public comment period on the addition of restrictions in areas designated as cow/calf waters will end on January 22, 1988.

ADDRESS: E.C. Fullerton, Regional Director, Southwest Region, National Marine Fisheries Service, 300 South Ferry Street, Terminal Island, CA 90731, Telephone: (213) 514-6201.

FOR FURTHER INFORMATION CONTACT: Doyle E. Gates, Administrator, Western Pacific Program Office, Southwest Region, National Marine Fisheries Service, 2570 Dole Street, Honolulu, Hawaii 96822, Telephone: (808) 955-8831; H.E. Witham, Senior Resident Agent, Enforcement Division, Southwest Region, National Marine Fisheries Service, P.O. Box 50246, Honolulu, Hawaii 96850, Telephone: (808) 541-2727; or James H. Lecky, Wildlife Biologist, Southwest Region, National Marine Fisheries Service, 300 South Ferry Street, Terminal Island, California 90731, Telephone: (213) 514-6664.

SUPPLEMENTARY INFORMATION:

Background

In 1970, the humpback whale was designated as endangered under the Endangered Species and Conservation Act of 1969 (since superseded by the Endangered Species Act of 1973 (ESA)). In 1979, NMFS published a "Notice of Interpretation" (NOI) to inform the public of activities that could be interpreted as harassment of whales. The NOI contained guidelines for approaching whales and proper conduct of vessel operators when following or watching whales. The guidelines were not effective because vessel operators frequently approached nearer than the prescribed distance to view whales.

Since guidelines do not have the same legal standing as regulations, NMFS has had difficulty prosecuting violators. Before NMFS can prosecute an individual who fails to adhere to the guidelines, it must be demonstrated that an approach closer than the prescribed distance resulted in a take as defined under the ESA (i.e., harassment). Demonstrating conclusively that a close approach resulted in harassment of a whale is difficult. Consequently, most who fail to adhere to the guidelines are not prosecuted, even though collectively their actions are contributing to the displacement of whales from nearshore habitat.

To provide better protection of the whales and to minimize the effects of increasing vessel traffic on the whales, NMFS has determined that a need for regulations exists. On November 24, 1986, NMFS published a proposed rule governing approach to humpback whales in Hawaiian waters (51 FR 42271). This proposal prohibited vessels or people from approaching whales closer than 100 yards and aircraft from approaching within 1,000 feet of any humpback whale.

The proposed rule differed from the guidelines since it did not contain cow/calf areas (also called calving/breeding areas). Several commentors, including the Marine Mammal Commission, viewed this approach as relaxing the protective standards established by the guidelines. In response, NMFS reviewed available information on the effects of vessel traffic on whales and on the distribution of whales in Hawaiian waters and, based on results of this review, decided to incorporate cow/calf areas in the rule.

Although Forestell (1985) did not find distinct cow/calf areas during aerial surveys of humpback whale distribution, he did find evidence that humpback whales were being displaced by increased vessel traffic. During aerial surveys of humpback whales in 1976/77, Herman et al. (1980) noticed few whale sightings in the vicinity of Lahaina.

This was attributed to vessel traffic that was centered in Lahaina. In 1985, Forestell discovered that a similar situation had developed in Maaleae Bay near Keawakapu, Maui, and attributed the few sightings to increased vessel traffic in the area associated with the construction of a boat launching ramp at Keawakapu in 1983.

Researchers working from small boats off south and west Maui commonly note resting cows with calves (Glockner-Ferrari and Ferrari 1985, 1987). Resting behavior is presumed to occur in nearshore waters to provide calves with protection from offshore predators (large sharks and toothed cetaceans) and to minimize energy expenditure of postpartum, lactating females and nursing calves. Glockner-Ferrari and Ferrari (1985) reported a decreasing percentage of cow/calf pairs found near shore off west Maui. In early 1987, they reported that the trend was continuing.

NMFS believes that displacement of cow/calf pairs may result in both increased stress and increased susceptibility to predation. Although there is little information on the effects of stress on cetaceans, inferences may be drawn from information on other mammalian taxa. Adverse effects of stress demonstrated by some ungulate (hoofed animals) populations include weight loss, susceptibility to predation, and reduced reproduction (Geist 1971; Wallach and Boever 1983).

It is questionable whether all species of whales can avoid the effects of stress by becoming accustomed to the presence of increased vessel traffic.

Based on 25 years of observing whales in Cape Cod waters, Watkins (1986) believes that humpbacks have become accustomed to vessel traffic and now are attracted by vessel noise rather than repelled as they had been in the early years of his studies. Watkins also documents that other species have not become accustomed to vessel traffic over the same time period and are still repelled by vessel noise. Jones and Swartz (1984) indicate that gray whales are able to habituate to the physical presence, noise, and activities of whale watching vessels and skiffs in San Ignacio Lagoon, but gray whales abandoned Guerro Negro Lagoon during the years heavy barge traffic supported a salt production operation in that lagoon.

There are differing opinions concerning the effects of human activities on cetaceans. The evidence that whales are changing their distribution in Hawaii indicates that they are not habituating to disturbance associated with the increasing levels of vessel traffic. Because of the low population level of North Pacific humpback whales, the potential adverse effects of vessel traffic on the population and the apparent displacement of cow/calf pairs from nearshore habitat, NMFS has concluded that the appropriate management action is to require more restrictive approach limits in areas where cow/calf pairs are known to occur. Therefore, NMFS has added to the proposed rule the cow/calf areas that were originally designated in the NOI. The approach limit in these areas will be 1,000 feet for aircraft and 300 yards for vessels. Although the environmental community supported this change in comments on the proposed rule, the whale watching community and other users did not have an opportunity to comment on the designation of cow/calf areas. Therefore, NMFS is publishing this as an interim rule to give those groups, as well as other interested parties, an opportunity to comment.

Response to Comments on the Proposed Rule

Twenty-one organizations and individuals provided written comments on the proposed rule. Seven provided testimony at a public hearing held on December 15, 1986, in Lahaina, Maui, Hawaii. Of the twenty-eight comments and testimonies received, seven favored the proposed regulations as written. Ten commenters said that the proposed regulations required clarification on the issue of approach versus proximity to whales. Four commenters felt the proposed regulations were unnecessary. Seven stated that more rigorous conservation measures were required. The specific written and oral comments requiring a response are summarized below.

Comment: Seven commenters said that the proposed regulations required clarification on the issue of unintended approaches, i.e., whales approaching vessels closer than the prescribed limits.

Response: NMFS recognizes a difference between approach and proximity to humpback whales, and that whales may approach vessels. The proposed regulation clearly states that approach (moving toward) within the prescribed limits is prohibited. A vessel would not ordinarily violate the proposed regulation by inadvertently being inside the prescribed limits. NMFS Enforcement agents and NOAA General Counsel will assess both the actions of vessels and whales to determine if intentional approaches have occurred. If a motorized vessel is approached by whales while inside the prescribed limits, NMFS recommends that the vessel operator shift into neutral (and avoid revving the engine) until the whales are observed outside the prescribed limit. An operator of a sailing vessel who finds the vessel within the prescribed limits of a humpback whale should take immediate steps to place the vessel outside the prescribed limits.

Comment: Several commenters expressed concern that the failure of recent studies to identify distinct and persistent calving and breeding areas may reflect changes in the distribution of whales brought about by vessel disturbance. Thus, NMFS' failure to include designated calving and breeding areas was perceived as inadequate protection of important habitat.

Response: NMFS has reviewed available information and agrees that protection of known or previously identified resting areas for cows with calves may be warranted. Therefore, NMFS has included in the interim rule cow/calf areas in which greater restrictions apply. Since designation of these areas was not discussed in the proposed rule (51 FR 42271), NMFS is allowing a 60-day comment period to provide the public with an opportunity to express its views.

Comment: One commenter stated that the number of harassment complaints has decreased in recent years despite an increase in registered vessels, and, therefore, the current NOI was adequate.

Response: The effectiveness of the NOI was not judged by the number of complaints received but by its apparent utility in protecting whales. Available information indicates that there have been some changes in the distribution of whales in Hawaii and that disturbance from vessel traffic may be a cause. NMFS believes that the information on changing distribution of whales indicates that the NOI has not been effective in protecting whales from increasing levels of disturbance.

Comment: One commenter questioned the different approach limits in Hawaii and New England, pointing out that NMFS' New England whale watching guidelines recommend a 100 foot approach limit.

Response: The Northwest Atlantic stock of humpback whales, part of which is subject to whale watching in New England during the summer feeding season, is estimated to be at or above its initial (pre-exploitation) population size, and available information indicates that humpback whales off Cape Cod have acclimated to the presence of vessels (Watkins 1986). The North Pacific stock of humpback whales, in contrast, is thought to be at just 8 to 10 percent of its initial size, and available information suggests they are being displaced from nearshore waters in Hawaii (Glockner-Ferrari and Ferrari 1985 and 1987, Forestell 1985). NMFS believes these more restrictive measures are justified in Hawaiian waters under the authority of the ESA.

Comment: One commenter recommended implementing restrictions similar or identical to those in effect for Glacier Bay, Alaska (a National Park Service National Monument). A permit system for all vessels was suggested, along with adoption of a 400 yard approach limit in recognized calving and breeding areas, and the prohibition of cruise ships transiting "* * * through major whale waters and nearshore off Lahaina".

Response: NMFS believes providing a buffer around the whales is a more workable solution than attempting to restrict the number of vessels statewide. The National Park Service requires a ¼ nautical mile separation from humpback whales in Glacier Bay. The available information shows that humpback whales respond to vessels at one to several kilometers. There is little information on behavioral changes at distances between 0 and 1 kilometer. NMFS believes that adding the force of regulations to the existing guidelines will provide adequate protection to humpback whales in Hawaiian waters. NMFS will continue to monitor the situation in Hawaii to determine if additional protective measures are necessary.

Currently NMFS does not perceive cruise ships to be a problem. Cruise ships transiting Hawaiian waters spend the majority of their time in waters deeper than 100 fathoms where encounters with whales are unlikely.

Comment: Several commenters questioned the ability of NMFS to "* * * monitor the effects of all activities occurring in close proximity to whales to determine if additional measures are necessary * * *."

Response: NMFS agrees that a comprehensive humpback whale management effort is needed. We are developing a recovery plan for humpback whales which will include programs to monitor the status of the population and identify management needs.

Comment: One commenter criticized NMFS for short-sightedness in stressing enforcement activities over public education and research.

Response: NMFS has conducted a public education program in Hawaii since 1979. The research information on changing distribution of whales indicates that the public education program has not been effective. NMFS will maintain its public education program and expects the regulations to supplement the education program. Coordination of permitted research activities by the Western Pacific Program Office will allow NMFS access to the most recent information collected in each whale season.

Comment: Two commenters noted the apparent disparity in findings by whale researchers in New England, Alaska, Hawaii, and Mexico.

Response: NMFS acknowledges the different conclusions of researchers. Information from the New England area suggests that some species of whales may be becoming accustomed to vessel traffic. Researchers in Mexico found that gray whales abandoned a major calving lagoon in response to increased commercial shipping and dredging activities, and returned when the activities ceased. In Southeast Alaska and Hawaii, researchers found significant short term behavioral changes in relation to vessel activity. This ambiguity in the data indicates that a conservative approach should be taken in Hawaii.

Comment: One commenter stated that there is little hard scientific evidence to indicate that users of Hawaiian waters are having a negative impact on the reproductive fitness of North Pacific humpback whales.

Response: NMFS acknowledges that long term studies in this area are needed. However, the absence of definitive long term research results does not preclude the adoption of protective measures. The ESA requires NMFS to use the best available information in managing protected species. In this case, the information reviewed by the NMFS indicates that whales are being displaced from a portion of their habitat. Although no information on reproductive fitness is available, habitat loss usually results in reduced fitness. Therefore, NMFS believes there is sufficient information available to support this action.

Comment: One commenter stated that the proposed regulations appear to "* * * target the whale watching industry as the culprits and primary reason for the creation of said regulations".

Response: NMFS discussed the benefits derived from whale watching in the preamble to the proposed rule and stated its intent to provide an opportunity for that industry to continue. NMFS also stated that the vast majority of vessel traffic in Hawaii is not engaged in commercial whale watching. The regulation will apply equally to all water users.

Comment: One commenter suggested that Federal activities, including military activity which may adversely affect humpback whales, be prohibited by regulation.

Response: NMFS routinely consults with Federal agencies in its Endangered Species Act section 7 consultation process to ensure that federally funded or permitted activities are not likely to jeopardize the continued existence of humpback whales.

Comment: The U.S. Navy stated that Naval ships on maneuvers may violate the proposed regulations unintentionally, and suggested prohibiting only "intentional" approaches within 100 yards.

Response: NMFS will consult with the Navy, as appropriate, to ensure that activities are not likely to jeopardize the continued existence of humpback whales. The proposed regulation recognizes that vessel traffic may have adverse effects on whales. Naval vessels will be subject to the regulation just as all other vessels will be. NMFS enforcement agents and NOAA attorneys will assess both the actions of vessels and whales in determining if violations have occurred and whether prosecution is warranted under the circumstances.

Comment: One commenter recommended prohibiting jet ski and parasail activity in areas where cow/calf pairs have been commonly observed.

Response: Jet skis, parasails, and all other types of water craft are bound by the regulation. NMFS is not aware of any studies that indicate parasail or jet ski activities result in greater adverse reaction by whales than other vessel traffic. It is possible that constant noise associated with high speed traffic could present an effective acoustic and visual barrier. NMFS believes that constant, high-speed surface activity is a potential problem, and will continue to work with state agencies and private operators to address this issue.

Comment: Two commenters questioned the effectiveness of the 1,000 foot approach limit for aircraft in preventing harassment of whales, and suggested that greater limits be established.

Response: Most aerial surveys of cetaceans are conducted between 500 and 1,000 feet. In most instances, passes at 1,000 feet do not result in noticeable behavior changes. Although continual hovering by a large, or unusually noisy helicopter at an altitude over 1,000 feet may result in an obvious behavior change in a whale, such an action is covered by section D(a)(4) of the interim regulation which prohibits the disruption of normal behavior.

Comment: One commenter stated that the proposed regulation reduces the horizontal distance limit for aircraft to 100 yards.

Response: The proposed regulation clearly states that it would be prohibited "* * * to operate any aircraft within 1,000 feet of any humpback whale". This, in effect, creates a 1,000 foot aerial dome over a whale.

References

Darling, J.D. 1986. Robson Bight Ecological Reserve management plan—An assessment of the impacts of human activities on the killer whales of Robson Bight Ecological Reserve with management guidelines. Contract report submitted to Ministry of Environment and Parks, Victoria, British Columbia, Canada. 83 pp.

Geist, V. 1971. A behavioural approach to the management of wild ungulates. In E. Duffey and A.S. Watt (eds.), the Scientific Management of Animal and Plant Communities for Conservation. Blackwells Scientific Publ., Oxford. pp. 413–424.

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Jones, M.L. and S.L. Swartz. 1984. Demography and phenology of gray whales and evaluation of whale watching activities in Laguna San Ignacio, Baja, California Sur Mexico. In M.L. Jones, S.L. Swartz and S. Leatherwood (eds.) The Gray Whale (*Escherichtius robustus*). Academic Press. Orlando, Florida.

Wallach, J.P. and Boever, W.J. 1983. Diseases of exotic animals. W.B. Saunders Co., Philadelphia.

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Classification: Applicability of Other Laws, Regulations and Requirements

NMFS has prepared an environmental assessment in which it determined that approval and implementation of the proposed rule would not significantly affect the quality of the human environment, and that the preparation of an environmental impact statement would not be required by section 102(2) of the National Environmental Policy Act or its implementing regulations.

The NOAA Administrator determined that this rule is not a "major rule" under Executive Order 12291 and that the proposed action will not result in (1) an annual effect on the economy of $100 million or more; (2) a major increase in cost or prices for consumers, individual industries, Federal, State or local government agencies, or geographic regions; or (3) significant adverse effects on competition, employment, investment, productivity, innovation, or the ability of U.S. based enterprise to compete in domestic or export markets.

The General Counsel of the Department of Commerce has certified to the Small Business Administration that this action will not have a significant impact on a substantial number of small entities, and there will not be a difference in degree of impact due to varying sizes of business affected.

This rule does not contain a collection of information requirement for purposes of the Paperwork Reduction Act.

List of Subjects in 50 CFR Part 222

Endangered and threatened wildlife, Administrative practice and procedure, Exports: Fish, Imports: Marine mammals.

Dated: November 17, 1987.

Bill A. Powell,

Executive Director, National Marine Fisheries Service.

For the reasons set forth in the preamble, Title 50, Chapter II, Part 222 of the Code of Federal Regulations is amended as set forth below.

PART 222—[AMENDED]

1. The authority citation for Part 222 continues to read as follows:

Authority: 16 U.S.C. 1531–1543.

2. Subpart D—*Incidental Capture of Endangered Sea Turtles*, consisting of § 222.41, is redesignated as Subpart E.

3. A new Subpart D consisting of § 222.31 is added, to read as follows:

Subpart D—Special Prohibitions

Sec.
222.31 Approaching humpback whales in Hawaii.

Subpart D—Special Prohibitions

§ 222.31 Approaching humpback whales in Hawaii.

(a) *General*: Except as provided in §§ 222.23 through 222.28 (Scientific permits) and paragraph (b) of this section it is unlawful for any person subject to the jurisdiction of the United States to commit, to attempt to commit, to solicit another to commit, or to cause to be committed, within 200 nautical miles of the Islands of Hawaii, any of the following acts with respect to humpback whales (*Megaptera novaeangliae*):

(1) Operate any aircraft within 1,000 feet of any humpback whale; or

(2) Approach by any means, within 100 yards of any humpback whale; or

(3) Cause a vessel or other object to approach within 100 yards of a humpback whale; or

(4) Disrupt the normal behavior or prior activity of a whale by any other act or omission. A disruption of normal behavior may be manifested by, among other actions on the part of the whale, a rapid change in direction or speed; escape tactics such as prolonged diving, underwater course changes, underwater exhalation or evasive swimming patterns; interruptions of breeding, nursing, or resting activities; attempts by a whale to shield a calf from a vessel or human observer by tail swishing or by other protective movements; or the abandonment of a previously frequented area.

(b) *Cow/calf waters*. Except as provided in §§ 222.23 through 222.28 (Scientific permits), it is unlawful for any person subject to the jurisdiction of the United States to commit, to solicit another to commit, to attempt to commit, to solicit another to commit, or to cause to be committed, while in waters designated as cow/calf waters, any of the following acts with respect to humpback whales (*Megaptera novaeangliae*):

(1) Approach by any means within 300 yards of any humpback whale; or

(2) Cause a vessel or other object to approach within 300 yards of a humpback whale; or

(3) Operate any aircraft within 1,000 feet of any humpback whale.

(c) The following areas are designated as cow/calf waters:

(1) Adjoining the island of Lanai—all waters within two miles of the mean high-water line along the north and east between lines extending perpendicular from the coast from Kaena Point to Kamaiki Point;

(2) Adjoining the island of Maui—all waters inshore of a straight line drawn between Hekili Point and Puu Olai.

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