

DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

[Docket No. 921233-2333]

Endangered Fish and Wildlife; Gray Whale

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

ACTION: Notice of determination.

SUMMARY: Under the Endangered Species Act (ESA), NMFS has determined that the eastern North Pacific (California) stock of gray whale should be removed from the List of Endangered and Threatened Wildlife (the List). This determination is based on evidence showing that this stock has recovered to near its estimated original population size and is neither in danger of extinction throughout all or a significant portion of its range, nor likely to again become endangered within the foreseeable future throughout all or a significant portion of its range. NMFS believes that the western Pacific gray whale stock, which is geographically isolated from the eastern stock, has not recovered and should remain listed as endangered. In accordance with section 4(a)(2)(B) of the ESA, NMFS is recommending that the Department of the Interior implement this action by amending the List accordingly.

EFFECTIVE DATE: This determination is effective on January 7, 1993.

ADDRESSES: Copies of the references used in this document are available from: Office of Protected Resources, National Marine Fisheries Service, 1331 East-West Highway, Silver Spring, Maryland 20910.

FOR FURTHER INFORMATION CONTACT: Mr. Kenneth R. Hollingshead, Office of Protected Resources, NMFS, at (301) 713-2055.

SUPPLEMENTARY INFORMATION:**Background**

The Endangered Species Act of 1973 (ESA: 16 U.S.C. 1531 *et seq.*) is administered jointly by the U.S. Fish and Wildlife Service (FWS), Department of the Interior, and NMFS. NMFS has jurisdiction over most marine species and makes determinations under section 4(a) of the ESA as to whether the species should be listed as endangered or threatened. The FWS maintains and publishes the List of Endangered and Threatened Wildlife (the List) in 50 CFR part 17 for all species determined by NMFS or FWS to be endangered or threatened. A list of threatened and

endangered species under the jurisdiction of NMFS is contained also in 50 CFR 227.4 and 50 CFR 222.23(a), respectively.

Section 4(c)(2) of the ESA requires that, at least once every 5 years, a review of the species on the List be conducted to determine whether any species should be (1) removed from the List; (2) changed in status from an endangered species to a threatened species; or (3) changed in status from a threatened species to an endangered species. NMFS completed its first 5-year review on the status of endangered whales in 1984 (Breiwick and Brahm 1984). Based upon that status review, NMFS concluded that although no longer in danger of extinction, because of limited calving grounds and coastal habitat which is being subjected to increasing development, the eastern Pacific gray whale (*Eschrichtius robustus*) stock should not be delisted but should be upgraded to threatened (49 FR 44774, November 9, 1984). No further action was taken, however.

On January 3, 1990 (55 FR 164), NMFS announced that it was conducting status reviews on certain listed species (including the gray whale) under its jurisdiction, and solicited comments and biological information. That status review was completed and made available to the general public on June 27, 1991 (56 FR 29471). The **Federal Register** notice also stated that NMFS intended to publish a proposed determination that the listing status of the eastern North Pacific population of gray whale should be changed. That proposed determination and rule was completed and published in the **Federal Register** on November 22, 1991 (56 FR 58869).

In the proposed rule, NMFS gave notice that the comment period would close on January 21, 1992. However, as provided under section 4(b)(5)(E) of the ESA, NMFS received and accepted a request for a public hearing on the proposal (57 FR 3040, January 27, 1992). Public hearings were held in Silver Spring, Maryland, on February 14, 1992 and Long Beach, California on February 25, 1992. The comment period was extended until March 6, 1992 (57 FR 2247, January 21, 1992) in order to allow the public sufficient time to attend the hearings and complete their written comments.

Petition

Coincident with completion of the status review (but prior to its availability to the public), under section 4(c)(2) of the ESA and after work was initiated on the proposed determination and rule, the Secretary of Commerce

(Secretary) received, on March 7, 1991, a petition from the Northwest Indian Fisheries Commission and others, which requested, under section 4(b)(3)(A) of the ESA, the removal of the eastern stock of the North Pacific gray whale from the ESA. On March 27, 1991, the Under Secretary for Oceans and Atmosphere, NOAA, acknowledged the petition and NMFS began a review to determine whether the petition presented "substantial scientific or commercial information" that would support such an action.

NMFS completed that review and made a determination on December 10, 1991 (56 FR 64498), that the petition presented substantial information indicating that the requested action was warranted. The notice stated, however, that, because the status review had been completed, published, and made available to the general public, it had been determined that conducting another status review under section 4(b)(3)(A) would be duplicative and unnecessary. The notice concluded that the November 22, 1991, proposal could be accepted as the finding action required by section 4(b)(3)(B) for petitions found to contain substantial information.

Comments and Responses

During the 104-day comment period, NMFS received 103 letters and 612 photocopied form letters from the general public, all either opposing the delisting or recommending upgrading the status to threatened. Most of those commenting stated they opposed changing the status of the gray whale because of increased coastal pollution and development and boating activities. Oil and gas development, an increase in pressure to resume whaling, and "low genetic diversity" were other reasons given to oppose the proposed action.

In addition to the above, 30 letters were received within the comment period that substantially discussed the science upon which the proposal was based. Letters were received from the Governments of Canada, Russia and Mexico. Although all three governments chose not to comment on the internal decisions of another nation, the Government of Mexico submitted comments on behalf of its fisheries agency. These comments are addressed below. Comments and recommendations were received from the Marine Mammal Commission (MMC) on May 15, 1992. As provided by section 202(d) of the Marine Mammal Protection Act (MMPA) (16 U.S.C. 1361 *et seq.*), NMFS will respond in detail to the MMC's specific recommendations by a separate letter. However, their

comments and recommendations and the comments of others are discussed below.

General Comments: Population Estimates

Comment: Two commenters questioned the accuracy of the population estimates given in the proposed rule, in particular the difference in population estimates between the United States and those supplied by the Government of Mexico in its submitted comments.

Response: The Mexican estimate of 15,000 ($\pm 2,000$) was obtained through aerial surveys of Mexican waters and is contained in a document submitted to the International Whaling Commission (IWC) Scientific Committee on the Assessment of Gray Whales. As the Document analyzed only raw data, the IWC Committee concluded it was not valid for indexing either abundance or trends (IWC 1990). In addition, the Mexican surveys, while limited to the breeding grounds, did not include all breeding lagoons and offshore waters. There was general agreement among scientists at the IWC meeting that the shore censuses along the migratory route are at present the appropriate way to estimate absolute abundance for this stock (IWC 1990). Reilly (1984) provides a more detailed explanation of the methods, assumptions and biases encountered with both aerial surveys and shore censuses of gray whales.

Comment: Two commenters noted that the U.S. population estimate for the eastern Pacific stock of gray whales is over 4 years old. They recommended that no action should be taken until new population estimates are made.

Response: The population estimate used in the proposed rule (21,113 (± 688)) was made in 1987/88. Although a revision of the 1987/88 estimate was presented at the 1992 IWC meeting (i.e. 23,859, CV=0.0536, 95% CI 21,500–26,500), a stock size of 21,113 has been accepted by the IWC as the best estimate available (IWC 1990). That latter number is accepted also by NMFS as the best estimate available for the population size in 1987/88. Considering that previous population estimates indicated that the stock has been increasing at a rate of 3.2 percent (± 0.5 percent) annually between 1967 and 1988 (IWC 1990), it is considered neither necessary nor appropriate, to delay the action in order to accrue more data on the population. Monitoring required by section 4(g) of the ESA will include biennial surveys to continue the assessment of the stock and emergency provisions that could be imposed if the stock declined precipitously.

Comment: Several commenters questioned NMFS' estimate that carrying capacity was in the range of 24,000 animals. Three commenters cited Reilly (in press) indicating that the carrying capacity may be as high as 35,000 which would affect the NMFS calculation that the population was about 88 percent of carrying capacity.

Response: The recent paper by Reilly was not available prior to completion of the proposed rule. The status review in this final determination has been modified to address the carrying capacity issue.

General Comments: Consideration as a Species Under the ESA

Comment: One commenter questioned the accuracy of the statement that there are two stocks in the Pacific Ocean and stated that unless it can be demonstrated that the populations are separate, then the western stock remains vulnerable as recolonization is dependent upon the eastern stock. Therefore, protection of the eastern stock is required. The commenter recommended that NMFS conduct photo-identification and skin biopsy studies to determine "the degree of isolation and/or possible genetic exchange between these two stocks."

Response: Section 4 of the ESA provides for listing (and therefore delisting) at different evolutionary levels (i.e., species, subspecies, or "distinct population segment") on the basis of the best scientific and commercial data available. For the reasons detailed below, NMFS concludes that the best available scientific evidence supports the finding that the stocks are geographically and reproductively isolated (see for example, IWC 1990). The basis for determining stock discreteness for gray whales was fully addressed in the proposed rule and continued in this determination. However, it should be recognized that as the western stock of gray whales will remain listed under the ESA and as gray whales will remain protected also under the MMPA and the International Convention on the Regulation of Whaling, implementation of this action will not affect the ability of the eastern Pacific stock to repopulate the western Pacific if research later were to demonstrate that the two stocks are in fact a single stock. The research proposed by the commenter, while useful, is neither necessary prior to implementing this action, as populations do not need to be totally isolated genetically in order to be listed or delisted, nor assured of success considering the extremely low numbers of the western Pacific stock sighted in

recent years. However, NMFS scientists will strongly encourage their Russian counterparts at IWC to collect and analyze appropriate samples from gray whales stranded in and around the Sea of Okhotsk for comparison with whales in their harvest. U.S. scientists plan to collect skin biopsy samples as part of the marine mammal stranding program and these samples will be available for comparison with any biopsy samples taken by Russia.

Comment: One commenter at the Silver Spring, Maryland, hearing objected to removing the eastern stock of gray whales from the List until the stock outgrows its (food) resources enough to trigger an expansion into its former range (i.e., the western North Pacific and Atlantic Oceans).

Response: As the proposal indicated, there are three distinct stocks of gray whales. One is extinct, a second near extinction and the third, the eastern Pacific stock, has recovered and is close to carrying capacity. Physical barriers (e.g. summer ice limits) prevent the eastern Pacific stock of gray whales from recolonizing habitat of the extinct Atlantic Ocean stock. It is also possible that a physical oceanographic barrier along the Kamchatka coast discourages intermingling of eastern and western Pacific stocks. To wait, as the commenter suggests, until these barriers are breached before removing the eastern Pacific stock from the List is not practical and is not required by section 4 of the ESA, which provides for listing (and therefore delisting) at different evolutionary levels (i.e., species, subspecies, or "distinct population segment").

General Comments: Use of Personnel

Comment: Two commenters were concerned that NMFS was spending time on this proposal that would be better utilized in listing species and designating critical habitats.

Response: NMFS is required under section 4(c)(2) of the ESA, at least once every 5 years, to review the status of the species on the List to determine whether any species status warrants change. NMFS completed this review in 1991 and, based upon that status review, and as required by section 4(c)(2)(B) of the ESA, concluded that the gray whale stock had recovered to near its estimated original population size and is neither in danger of extinction throughout all or a significant portion of its range, nor likely to become endangered again within the foreseeable future throughout all or a significant portion of its range. Based on that review, NMFS determined that the status of the eastern gray whale stock

should be changed (56 FR 29471, June 27, 1991).

Furthermore, on March 7, 1991, the Secretary was petitioned under section 4(b)(3)(A) of the ESA to remove the eastern stock of the North Pacific gray whale from the List. Thus, NMFS has a statutory obligation to review and take appropriate action on the status of listed species and also to take appropriate action upon receipt of a petition to amend the List.

General Comments: Monitoring

Comment: Several commenters expressed concern over NMFS' monitoring program and offered suggestions on the composition of the Task force, the types of research to be carried out and coordination with appropriate foreign governments. One organization recommended that the gray whale not be delisted unless their recommended extensive research and monitoring program can be conducted. Another suggested that the monitoring program be conducted but that the stock only be upgraded to threatened status.

Response: Because they will be advising the Assistant Administrator on grants and on internal NMFS research on gray whales, including budgetary actions, the gray whale task force will be composed of NMFS marine mammal scientists. The final determination has been modified to make this issue more clear. Also, some types of research suggested for NMFS to conduct, either alone or within a multilateral agreement, but as part of its monitoring program, are viewed by NMFS as not being within the scope of requirements for monitoring under section 4(g) of the ESA. For example, one commenter's suggested research would require long-term monitoring of the coastal environment of the Bering Sea (feeding grounds), central and southern California (migratory route) and Baja California (calving grounds). Such research would be prohibitively expensive, taking away funds needed elsewhere and, without establishing a control, would not likely be successful. While baseline data might prove useful in the future, a direct cause-and-effect link between environmental conditions and the health of the marine mammal stocks would be difficult to prove. NMFS believes that monitoring the eastern Pacific gray whale stock in compliance with section 4(g) of the ESA can be accomplished through biennial shore-side surveys along the California coast, and a cooperative research program with Mexico to monitor trends and abundances in the lagoons in Baja California. Additional research would be funded if, during (or after) the

mandated monitoring period, the stock indicates signs of environmental stress. Additional research proposed to be conducted on gray whales (i.e., photo-identification studies on isolated subpopulations, genetic diversity studies, analysis of tissue samples for contaminants from stranded animals, etc.) that is not considered part of the described monitoring program will be required to compete with other funding requirements for marine mammal research or could be funded by other sources (e.g., MMC, Minerals Management Service (MMS), or the National Science Foundation).

General Comments: Section 7 Consultations

Comment: One commenter recommended that NMFS provide a more complete review of those biological opinions which determined that the action could result in jeopardizing gray whales and an explanation on whether the findings of those biological opinions are no longer valid based upon new information or on a reevaluation of information originally considered in the opinions. Another commenter at the Silver Spring MD hearing recommended that NMFS reexamine the biological opinion(s) which contain(s) a jeopardy determination for gray whales and to remove that finding if the gray whale is delisted.

Response: NMFS has expanded the discussion on the impacts of oil and gas activities on gray whales. NMFS has also reexamined the findings in the earlier biological opinions, and concluded that, while the cumulative impacts from oil and gas activities may have the potential to affect adversely the eastern North Pacific gray whale stock, these impacts are not likely to jeopardize its continued existence. A copy of this reanalysis is available upon request (see ADDRESSES). See also the discussion of oil and gas development under Factor (A) below.

Comments on the Present or Threatened Destruction, Modification, or Curtailment of Its Habitat or Range

Comment: Several commenters were concerned that should the gray whale be delisted, habitat protection will be lost. On a closely related issue, several commenters were concerned about increasing development throughout the gray whales' range but particularly over tourist facilities and oil and gas development, in the coastal breeding lagoons. Two were concerned about the potential loss of benthic food sources by development in these coastal lagoons. Another was concerned about the

potential loss of food resources in the Bering Sea if an oil spill were to occur.

Response: The final determination has been modified and expanded to discuss, in greater detail, habitat concerns in the Bering Sea, along the Northwest Coast migration pathway and in the coastal lagoons in Baja California. However, as the benthic resources available to gray whales appear to be minimal in the coastal lagoons, and as the feeding which does occur (see Summary of Status Review) is probably opportunistic on pelagic organisms (Nerini 1984), coastal development does not appear to constitute a significant impact on gray whale food sources in the southern grounds at this time.

Comment: Several commenters expressed concern that the proposal did not adequately address the impact of general onshore development along the California coast, including the loss of wetlands, on the gray whales. One of these commenters was also concerned about the potential for intensive coastal development along the Washington/Oregon coast, especially in the Gray's Harbor area, should offshore oil development commence.

Response: The issue of onshore coastal development is not discussed in any depth since, other than in the breeding/calving lagoons in Baja, a direct relationship between the two is largely speculative. However, as impacts from agricultural and industrial runoff and sewage may have some impacts on that portion of the stock that enters the enclosed embayments along the Pacific coasts, this impact was discussed in the proposed rule and is continued in this final determination.

Comment: Several commenters were concerned that bioaccumulation of toxic compounds in gray whales may pose jeopardy to the continued existence of the gray whale. One commenter was particularly concerned about increased strandings in Puget Sound and related them to their feeding in the "chemical soup" of the Sound.

Response: Although the November 22, 1991 proposal addressed this concern in some detail, the final determination has been updated with more recent analyses. These commenters did not dispute NMFS' findings cited in the proposed rule, and did not provide data or references, other than anecdotal, contrary to NMFS' cited research results (NMFS 1990) that chlorinated hydrocarbon and heavy metal contamination did not appear to be significant enough to cause deleterious effects to gray whales (see also Factor C: Disease or Predation). For that reason, a finding different from the one presented in the proposal is not warranted.

Comment: Some commenters were of the opinion that NMFS seriously underplayed the potential impacts from oil and gas activities, including the extent of activities along the Pacific coasts of Mexico, Canada and Russia.

Response: Although there is a possibility of joint-venture oil and gas operations between Russia and international oil companies, especially as recently reported for the Navarin Basin, no specific information is available to NMFS on scheduling of offshore oil activities off Russia, Mexico, or Canada at this time. As the commenters did not submit data supporting their contention, this issue cannot be addressed in any greater detail than was supplied in the proposal. Discussion of future oil and gas activities within U.S. waters, which was mentioned under the section 7 consultation portion of the proposal, has been moved and expanded in this part of the final determination (see the discussion under Factor (A) below). A description of present-day oil and gas activities and anticipated future events has been added to this section.

Comments on Overutilization for Commercial, Recreational, Scientific or Educational Purposes

Comment: One commenter expressed concern that delisting could lead to an increase in subsistence use of gray whales including use by the Makah Tribe for subsistence or ceremonial purposes.

Response: Native Americans in Washington, Oregon and California currently do not intentionally take gray whales. Should Native Americans in these States wish to begin taking gray whales, it would be necessary for them to gain access to the IWC's quota for subsistence takes. The IWC quota for the eastern gray whale stock is 169, which is taken by Russia for its Chukchi Natives. There is no indication from Russia that there is a need for a higher subsistence quota, although one could be authorized if documented as necessary, since the current subsistence quota is less than sustained yield (IWC 1990). More detailed information on both issues can be found elsewhere in the preamble.

Comment: One commenter was concerned that whale-watching activities might drive gray whales from critical habitat.

Response: While critical habitat has not been formally designated for gray whales, consideration of breeding, feeding, and migratory areas as important components for gray whale survival is appropriate. Whale-watching activities on the breeding grounds and

along the migratory route, in addition to general recreational boating, are identified impacts on gray whales, which we readdressed in the November 22, 1991, proposal and in this action.

Comments on Disease or Predation

Comment: Two commenters were concerned that cumulative impacts from anthropogenic contaminants, biotoxins, noise, and disturbance could cause stress-induced immunosuppression resulting in non-natural mortality. One commenter was concerned that the proposed rule did not consider the potential future effects of biotoxins on gray whales.

Response: The proposed rule discussed these impacts in some detail. The conclusion was that individual and cumulative impacts, while they may have the potential to affect adversely the eastern North Pacific gray whale stock, are not likely to jeopardize its continued existence. Immunosuppression response in gray whales remains hypothetical at this time. There is no evidence outside of the captive environment that such a reaction occurs, although it is alleged to have occurred in certain odontocetes. Also, a link between biotoxins caused by phytoplankton and gray whales has not been shown to exist and at this time can be assumed to be unlikely (at least on primary feeding grounds) since gray whales, unlike previously identified impacted marine mammal species such as humpback whales and bottlenose dolphins on the U.S. East Coast, do not feed on those species of fish likely to contain the biotoxin. It bears watching whether that small portion of the population inhabiting Puget Sound becomes affected by the domoic acid outbreak in shellfish. A monk seal die-off in 1978/79 mentioned by the commenter was likely due to ciguatera and maitotoxin, both caused by ingesting reef fish, not a normal component of the gray whale diet.

Comments on Inadequacy of Existing Regulatory Mechanisms

Comment: Several commenters were concerned that changing the status of the gray whale could encourage other nations to request a change in the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) or for whaling nations or subsistence users to request the IWC to increase the quota. One commenter expressed concern that if the stock is delisted, other nations might ease their protective laws for gray whales and in this venue, NMFS should describe all applicable laws and assess their provisions.

Response: The issue of increasing the subsistence quota on gray whales has been discussed above and elsewhere in the preamble. Any actions taken under CITES or the IWC would be determined based upon the status of the gray whale stock, not by NMFS' delisting action. Under both international agreements, the status of the gray whale is subject to change depending upon a majority vote of their members independent of any action the United States takes under the ESA. The IWC, for example, establishes a gray whale quota based upon the status of the stock. The gray whale was changed from a "Protected Stock" to a "Sustained Management Stock" in 1978 on the basis that under a relatively constant harvest, the stock had apparently remained stable over a period of 11 years (IWC 1979). Recent exercises within the IWC to determine whether the stock should be reclassified as an "Initial Population Stock" (a step necessary in order for a commercial harvest quota to be established), have not been successful. The subsistence quota is set presently at 169 and there is no indication that a higher quota is warranted, although it is possible one could be authorized, since the current subsistence quota is less than sustained yield (IWC 1990). As mentioned later under the Factor, any increases in the subsistence take of the eastern stock of gray whales, by itself, is not likely to impact that stock significantly.

As stated in the proposed rule, existing national laws are considered adequate at this time and, under this Factor, it is existing regulatory measures that must be taken into account when determining impacts on a species.

While NMFS has determined that it is not necessary to publish a list of appropriate national laws and regulations and evaluate their effectiveness, the final determination has been expanded to more fully describe regulations pertaining to the protection of gray whales within their coastal lagoons.

Comment: Under this Factor, one commenter also wanted NMFS to "conduct and provide a more comprehensive assessment of present and foreseeable threats to the principal breeding lagoons, feeding grounds, and other areas of special biological importance to the species" prior to making a determination that laws are adequate to protect gray whales.

Response: Although NMFS does not consider it appropriate to provide a comprehensive assessment of threats to gray whales under this Factor, such an assessment was provided under Factor A.

Comment: Several commenters were concerned that the regulatory mechanisms provided under CITES, IWC, and the MMPA could not prevent habitat degradation, or a resumption of whaling. In addition, concern was made by several reviewers over the loss of section 7 consultations if the stock was removed from the List.

Response: While section 7 consultations would cease for the gray whale if the eastern Pacific stock was removed from the List, other laws and activities would protect the coastal habitat. The final determination has been expanded to incorporate these concerns.

Comment: Several commenters recommended that if the species is delisted, NMFS establish an international conservation plan under the MMPA. One commenter recommended that this international research be conducted under multilateral treaties and agreements under the monitoring requirements of section 4 of the ESA. In addition, this commenter wanted NMFS to undertake, or cause to be undertaken, research recommended by the IWC in 1990.

Response: NMFS has included as part of its monitoring program a proposed cooperative research effort with the Government of Mexico. NMFS will also continue to conduct gray whale research under the aegis of the IWC. While cooperative research programs with other Pacific Rim nations would likely result in improved knowledge on the gray whale, implementation of an international conservation plan under the MMPA for a non-depleted species, independent of the IWC, is viewed as being neither likely to be successful, nor an efficient use of Agency resources, since other marine mammal species, including seriously depleted or endangered species, could benefit from this attention and funding. However, NMFS will continue, through participation in the IWC, to encourage other Pacific Rim nations to conduct research on gray whales, particularly the western Pacific gray whale stock, which will remain listed as endangered.

Comments on Other Natural or Man-made Factors Affecting Its Continued Existence

Comment: Several commenters were concerned that the species was reduced to such low levels early in the century that its genetic diversity is limited, which may impact the species' future viability, in particular making it more vulnerable to disease.

Response: There is no evidence that the eastern Pacific gray whale stock's genetic composition was compromised

by its reduction to approximately 4–5,000 in the mid-19th century. While an analysis of skin biopsy samples from gray whales taken in harvests or strandings, for the degree of heterozygosity would be informative, and may provide some insight into the degree of severity of the harvest reduction, it is not clear that it would provide much help in determining whether the eastern North Pacific gray whale is either in danger of extinction throughout all or a significant portion of its range, or likely to again become endangered within the foreseeable future throughout all or a significant portion of its range.

Comment: One commenter expressed concern that the proposal did not adequately address the impact of commercial fisheries on gray whales, including the deterrence of high penalties under the ESA in comparison to the MMPA, the reluctance of fishermen to report "takes" of endangered and threatened species, the low observer coverage in fisheries and the relationship between the ESA and state fishery regulations.

Response: While NMFS considers the discussion on the relationship between commercial fisheries and the eastern North Pacific stock of gray whales in the proposal to be adequate, the final determination has been expanded to address these additional concerns.

Comment: One commenter recommended that the discussion of this Factor address other issues in addition to commercial fishing, including vessel traffic, whale-watching, pollution, coastal development, and other activities that may affect gray whales and their habitat.

Response: The activities mentioned by the commenter were all addressed under Factors 1 through 4 in the proposed rule and in this document as Factors A through D and need not be repeated under this Factor. NMFS recognizes that categorizing an impact within a specific Factor is not always clear. However, in order to reduce repetition of text, NMFS has chosen to discuss a specific impact in its entirety under the first Factor wherein the impact is mentioned, for example, under Factor A, discussion of the impacts of oil spills on gray whale habitat is appropriate, therefore discussion of oil impacts on the gray whale as a individual, is also discussed under this Factor rather than delaying discussion until Factor E. This also facilitates comprehension and understanding of the impact.

Status Review

The gray whale is confined to the North Pacific Ocean. Two stocks occur in the North Pacific: the eastern North Pacific or "California" stock, which breeds along the west coast of North America, and the western Pacific or "Korean" stock which apparently breeds off the coast of eastern Asia (Rice 1981). Because it uses coastal habitats extensively, the gray whale was especially vulnerable to shore-based whaling operations and both stocks were severely depleted by the early 1900s. Under legal protection since 1946, the eastern North Pacific stock has recovered to its estimated original, pre-commercial exploitation population size (Rice *et al.* 1984), but apparently remains below the ecosystem's carrying capacity for that stock (Reilly 1992).

The estimated stock size in 1987/88 ($21,113 \pm 688$; Breiwick *et al.* 1989) is above Henderson's (1972, 1984) estimated initial (1846) stock size of 15,000–20,000, but below Reilly's (1981) estimate for carrying capacity of 24,000 gray whales. Between 1967 and 1988, the stock increased at a rate of 3.2 percent (± 0.5 percent) per year (IWC 1990; see Reilly *et al.* 1983 and Reilly 1987, for analysis of the 1967–1980 data; Rugh *et al.* 1990, for the 1985–1986 data; Breiwick *et al.* 1989, for the 1988 population estimate). Using Reilly's (1981) estimate with Breiwick *et al.*'s (1989) estimate of population size, it is likely that the gray whale population is within its optimum sustainable population (OSP) size or at about 88 percent of estimated historic carrying capacity ($21,113/24,000 = 88$ percent).

More recently however, Reilly (1992) stated that it is not entirely clear where the population is in relation to its current carrying capacity. He noted that if early aboriginal kills were 50 percent higher than documented, estimates of carrying capacity would range from 23,000 to about 35,000 and the population would be between 60 percent and about 90 percent of carrying capacity. However, Reilly (1992) noted also that the possible recent decline in pregnancy rates (see also IWC 1990) and possible signs of overexploitation of the benthic fauna upon which gray whales feed in the Bering and Chukchi Seas (see also Stoker 1990, IWC 1990), if verified, may be evidence that the stock is nearing the limits of its environment and therefore approaching carrying capacity. Another indication implying that the stock may be approaching carrying capacity is the increased observation of females with newborn calves in areas outside the calving

lagoons, especially during the southbound migration (Jones and Swartz 1989, Swartz 1990). Alternatively, the fact that the calving lagoons do not appear to be saturated (Swartz 1990) may indicate that gray whales continue to reoccupy their former range. However, since early calving has been observed previously (for example off Mission Bay California in 1963/64 by Gilmore and McIntyre where the birth was observed (McIntyre, pers. comm. 1991) and off Monterey California in 1974 (Sund 1975)), this may be a normal event and the calving lagoons are neither a factor limiting the increasing size of the gray whale population, nor, considering their geologically transient nature, as critical a component of the gray whale's habitat as previously assumed (see for example, Rice *et al.* 1984 and 49 FR 44774, November 8, 1984). However, data on the mortality rate of newborn calves outside the calving lagoon environment in comparison to mortality within the lagoons (approximately 5 percent) are needed to verify this hypothesis.

The eastern Pacific stock has increased in spite of increased human use of the coastal habitat (i.e., nearshore migration route where mating and calving occur), and a subsistence catch of 167 (± 3.5) whales per year by the former Soviet Union during the past 30 years (calculated from data in Ivashin in press).

Most of the eastern North Pacific stock spends the summer feeding in the northern Bering and southern Chukchi Seas (Rice and Wolman 1971, Rice *et al.* 1984). In the northwestern Bering Sea, they have been noted in recent years to be extending their range west of Cape Olyutorisk on the Chukhot Peninsula. Unless this is simply an artifact of increased observation effort, gray whales may be extending their range in search of additional food resources. In the Beaufort Sea, sightings have been made of individuals as far east as long. 130°W during August (Rugh and Fraker 1981) and in the East Siberian Sea, gray whales were found along the Siberian coast as far west as 174°08'E in late September (Marquette *et al.* 1982). Berzin (1984) believes these distributions are probably limited by pack ice in the summer. Although actual timing depends upon feeding conditions and patterns of ice formation, during October and November the stock begins leaving the Chukchi Sea (Braham 1984). Moving at about 125 km/day (Braham 1984), they exit the Bering Sea through Unimak Pass, Alaska, mainly in November and December (Rugh and Braham 1979, Braham 1984, Rugh 1984). The whales migrate near shore

along the coast of North America from Alaska all the way to central California (92 percent pass within 1.6 km of Cape Sarichef, Unimak Pass (Rugh 1984), and 94 percent pass within 1.6 km of the Monterey-Point Sur area of central California (Sund and O'Connor 1974)). After passing Point Conception, California, Rice *et al.* (1984) believed the majority of the animals took a more direct offshore route across the southern California Bight to northern Baja California. This route passes Santa Rosa and San Nicolas islands, the Tanner and Cortes banks and into Mexican waters (MMS 1992). Other routes include the nearshore route which follows the mainland coast of California, and the inshore route which passes through the northern Channel Island chain to Santa Catalina or San Clemente Island and on into Mexico. Bursk (1988) contends that gray whales have moved further offshore recently and Graham (1989) estimates that 14, 15, and 25 percent of the estimated population size passed west of San Clemente Island during the southbound migration in 1986/87, 1987/88 and 1988/89, respectively. Off California, southbound migrating gray whales swim at about 5.5–7.7 km/hour, and thus travel about 132–185 km per day with day and night speeds not statistically different (Pike 1962, Jones and Swartz 1987, Swartz *et al.* 1987).

Migrating gray whales are temporally segregated according to sex, age, and reproductive status (Rice and Wolman 1971). During the southward migration, the sequence of passage off California is as follows: Females in late pregnancy, followed by females that have recently ovulated, adult males, immature females, and then immature males (Rice *et al.* 1984). The earliest southbound migrants (mostly late-pregnant females) usually travel singly, whereas later migrants usually are in pods of two or more. The mean pod size through Unimak Pass is about two (Rugh 1984).

The eastern Pacific stock winters mainly along the west coast of Baja California. The pregnant females assemble in certain shallow, nearly landlocked lagoons and bays where, after a 418-day gestation period (Rice *et al.* 1981), the calves are born from early January to mid-February. The majority of gray whales in Baja California (including some cows with calves) spend the winter outside the major breeding/calving lagoons along the outer coast apparently from Bahia de Sebastian Vizcaino to Boca de las Animas. Recent research indicates that females with calves do not necessarily restrict themselves to a single lagoon, but may move between and among lagoons and the outer coast during the

winter (Jones and Swartz 1984). While calving was assumed to occur only rarely during the southbound migration north of Baja California (Rice and Wolman 1971), more recently, Swartz (IWC, 1990) noted that in the Channel Islands "calves of the season comprised 13.3% of all whales counted * * *." These observations suggest that calves may be born as far north as Washington State (Jones and Swartz 1987). A few calves are also born on the eastern side of the Gulf of California at Yavaros, Sonora, and Bahia Reforma, Sinaloa, Mexico (Gilmore 1960; Gilmore *et al.* 1967).

The northbound migration begins in mid-February and continues through May with the earliest northbound migrants passing San Diego before the last of the southbound migrants (Rice *et al.* 1981). By April, the early migrating whales begin showing up in the southern Bering Sea, which they enter through Unimak Pass. This migration is completely coastal, at least to the east of central Bering Sea (Nunivak Island). Most of the animals in Alaska travel within one km of the coast, avoiding embayments, especially in the southeastern Bering Sea, and at least some apparently feed during migration (Braham 1984). However, because suitable feeding habitat is relatively uncommon south of the Bering Sea, few gray whales remain south of Unimak Pass to spend the summer along the west coast of North America in apparently isolated locations as far south as Baja California, Mexico (Nerini 1984). During the northward migration, the sequence, in two phases, is as follows: Newly pregnant females, followed by other mature females, adult males, and immature males and females. Cows with calves are the last animals to leave the lagoons, and most migrate after the other whales (Rice *et al.* 1984) with a more protracted period of migration (Swartz 1990). The cow/calf phase of the spring migration generally peaks 7 to 9 weeks after the peak of the first migration phase (Poole 1984). On the northern grounds, primary feeding locations appear to be in the Chirikov Basin, the north side of the Chukchi Peninsula, nearshore waters of the western Bering Sea, and the southern capes of St. Lawrence Island (Nerini 1984). These benthic foraging areas are all underlain by dense infaunal communities of crustaceans (Nerini 1984).

The western Pacific stock formerly occupied the northern Sea of Okhotsk in the summer, as far north as Penzhinskaya Bay, and south to Akademii and Sakhalinskiy Gulfs on the west and the Kikhchik River on the east

Southern whales migrated along the coast of eastern Asia from Tatarskiy Strait to South Korea (Rice and Wolman 1971) to winter breeding/calving grounds, which probably lie along the coast of southern China in Gwangxi and Gwangdong provinces, and around Hainan Island (Wang 1984). Until the turn of this century, another migration route led down the eastern side of Japan to winter grounds in the Seto Inland Sea, Japan (Omura 1974). The status of the western Pacific stock of gray whales is uncertain (Brownell and Chun 1977). Sightings of 24 animals in the Okhotsk Sea and nine off the tip of Kamchatka in 1983 (Blakhin *et al.* 1985, Votrogov and Bogoslovskaya 1986), and 34 in 1989 in the Okhotsk Sea (Berzin in press) suggest that the stock is small. There is no evidence that it has reoccupied its entire former range (Omura 1984) and initial stock size may have been only a few thousand (Omura 1988). Although Rice *et al.* (1984) concluded that it is likely that the stock is below a critical population size sufficient for recovery and may be almost extinct, Berzin (in press) suggests that the stock is increasing slowly.

The gray whale formerly occurred in the North Atlantic, but has been extinct there for several centuries (Mead and Mitchell 1984).

Consideration as a Species Under the ESA

The ESA defines "species" to include any subspecies of fish, wildlife, or plants, and any distinct population segment of any species or vertebrate fish or wildlife which interbreeds when mature.

Two stocks of gray whales remain extant, both in the North Pacific Ocean: (1) The western stock, which migrates between feeding grounds in the Sea of Okhotsk and breeding/calving grounds along the South China Coast; and (2) the eastern stock, which migrates between breeding/calving grounds along the West Coast of Mexico and feeding grounds in the Bering and Chukchi Seas (Rice and Wolman 1971). These stocks appear to be significantly isolated both geographically and reproductively from each other. Recent strandings of gray whales on the Commander Islands are believed to be from the eastern stock, while gray whales reported along the Kamchatka coast are believed to be from the Okhotsk-South China population (IWC 1990). Alternatively, all strandings may be from the Korea stock (Rice 1981, IWC 1986). Since gray whales mate during their autumnal southward migration, rare vagrants would make interbreeding between the California and western Pacific population possible.

However, that possibility would be greatly reduced if, as Rice (1981) believes likely, most vagrants are immature animals. The absence of sightings between the Okhotsk Sea and the Commander Islands suggests the stocks are separate (IWC 1990). Mitchell suggests that an absence of aboriginal whale hunting records along the Pacific coast of the Kamchatka Peninsula may indicate a lack of abundance of gray whales in the area and a hiatus in distribution between eastern and western stocks (IWC 1990). In addition, Yablokov and Bogoslovskaya (1984) after reanalyzing data collected by earlier investigators, found that, in addition to differences in cranial measurements indicating the Okhotsk-Korea stock to be statistically larger in size than the Chukotka-California stock, the latter stock had fewer throat grooves and a smaller number of baleen plates. These authors believe that these differences may indicate the existence of two distinct groups which may allow them to be designated as subspecies. After reviewing the data available to it, the IWC Scientific Committee on the Assessment of Gray Whales (IWC 1990) agreed that the eastern and western populations of gray whales probably represent geographically isolated stocks, although recognizing that the existing data are not conclusive.

Based on the above discussion, NMFS believes that the best scientific and commercial data available supports the determination that there are two separate stocks of gray whales in the North Pacific Ocean and that the eastern North Pacific gray whale stock can be considered a distinct population and hence a species under the ESA.

Summary of Factors Affecting the Species

Section 4(a)(1) of the ESA and the NMFS' listing regulations (50 CFR part 424) set forth procedures for listing, reclassifying or removing species. The Secretary of either the Interior or Commerce, depending upon the species involved, must determine if any species is endangered or threatened based upon any one or a combination of the following factors: (A) The present or threatened destruction, modification, or curtailment of its habitat or range; (B) overutilization, scientific or educational purposes; (C) disease or predation; (D) inadequacy of existing regulatory mechanisms; or (E) other natural or man-made factors affecting its continued existence. Under section 4(a)(2) of the ESA, if the Secretary of Commerce determines that a species under her jurisdiction should be

removed from the List or changed in status from endangered to threatened, the Secretary then recommends such action to the Secretary of the Interior. If the Secretary of the Interior concurs with the action, he must implement the action by amending the List. However, if a species is removed from the List, the Secretary, under section 4(g) of the ESA, must implement a system in cooperation with the states to monitor effectively, for a period not less than 5 years, the status of the species and must use the emergency authority provisions under paragraph (b)(7) of section 4 to prevent a significant risk to the well-being of any recovered species. These factors and subsequent consultation with the Department of the Interior are discussed below.

Factor (A)—The Present or Threatened Destruction, Modification or Curtailment of Its Habitat or Range.

Two potential threats to the eastern North Pacific gray whale population are increasing vessel traffic (including whale watching activities), and industrial development (including oil and gas exploration and development), in the breeding/calving lagoons, feeding grounds, and along the migration route.

Commercial vessel traffic may result in the death of gray whales through collision or by harassment when both vessel and whale are confined to narrow passages. Heyning and Dahlheim (in press) documented 7 cases of gray whale/ship collisions; 5 in southern California, one each in Alaska and Washington. They surmised that gray whales may be unable to detect large ships in time to avoid collisions due to the size and speed of the vessels. However, because large vessels are restricted to certain travel lanes while in inshore waters (where gray whales are predominantly located) and the low period of vulnerability to large commercial vessels due to the whale's migratory nature, NMFS believes that few gray whales are killed annually by collisions with vessels.

Activities of commercial cruise boats and small pleasure craft may result in harassment of gray whales, especially in the breeding/calving lagoons in Baja California and along their migration route off California. As whale-watching activities increase rapidly in southern California and on the Baja Peninsula, harassment occurrences are increasing proportionally, particularly on weekends and holidays. Whale watching by recreational and commercial craft may negatively impact migrating gray whales by interrupting swimming patterns, altering migratory routes, and displacing cow/calf pairs from inshore waters, thereby increasing

every consumption (CMC/NMFS 1988, IWC 1990). Bursk (1988) contends that gray whales have moved further offshore recently due to whale-watching activities in southern California. Graham (1989) has noted a similar decrease in nearshore gray whales but attributed it to sea surface temperature anomalies in late 1988/early 1989. Others, such as Rice (1965), and Gilmore (1978), noted this offshore migration route earlier and Rice and Wolman (1971) considered the offshore passage to be a normal migratory route.

Vessels in the breeding/calving lagoons may cause short-term flight reactions by gray whales when the vessel is moving at high speeds or erratically, but gray whales will show little response to slow moving or anchored vessels. Gray whales have been reported to avoid vessels at ranges of roughly 0.5 km and less, with no documented responses at further distances (IWC 1990). However, Jones and Swartz (1984), in a study of gray whales in Bahía San Ignacio, found that data suggest that gray whales possess sufficient resiliency to tolerate the physical presence and activities of whale-watching vessels and skiffs and the noise produced by this level of activity without major disruption. This finding was supported by a noted increase in usage of the lagoons by gray whales, especially females with calves. Jones and Swartz (1984) believe a key factor responsible for maintaining a stable population within their study lagoon (*i.e.*, San Ignacio) was: (1) The establishment of the gray whale refuge, which provided an area free of all vessel activity to which whales could retreat and (2) the behavior of commercial whale watch operators to minimize disturbance.

Under the MMPA, gray whale harassment is considered a "take" and is prohibited. NMFS has established guidelines for whale watching in order to avoid harassment of gray whales on their migration path in U.S. waters and may implement regulations to limit approaches to marine mammals in 1993. In this regard, a proposed rule was published on August 3, 1992 (57 FR 34101) with a comment period due to expire on December 31, 1992. These regulations, if implemented, would be effective within waters under U.S. jurisdiction and for U.S. citizens except when within waters under the jurisdiction of another nation (*e.g.*, Canada and Mexico). These regulations would, if implemented as proposed, establish minimum approach distances for large cetaceans (100 yards) and will require procedures to avoid disrupting the normal movement or behavior of

marine mammals. It is anticipated that these regulations would strengthen protective measures for gray whales principally during migratory periods. Enforcement of these regulations will be accomplished through onboard monitoring of activities, citizen complaints and aerial and shipboard reconnaissance.

The main gray whale calving grounds in Mexico are Laguna Ojo de Liebre (Scammon's Lagoon with 53 percent of calves), Estero Soledad (12 percent), Laguna San Ignacio (11 percent) and Laguna Guerrero Negro (9 percent) in Mexico (Rice *et al.* 1984). However, the number of whales present at any one time is subject to fluctuations due to the interchange of whales between the lagoons (Jones and Swartz 1984). Minor calving areas, each with less than 6 percent of the calves, are San Juanico Bight, Bahía Magdalena, Bahía Almejas, and Bahía Santa Marina (Rice *et al.* 1981, 1984). A few calves are also born on the eastern side of the Gulf of California at Yavaros, Sonora, and Bahía Reforma, Sinola, Mexico (Gilmore 1960, Rice *et al.* 1984). Between 1972 and 1979, the Mexican Government designated three (Laguna Ojo de Liebre, Laguna Guerrero Negro, and Laguna San Ignacio) of the four major calving lagoons in Baja California as gray whale refuges. These are the lagoons that most of the U.S. tour boats and private tourists visit. The number of vessels allowed in these lagoons at any one time is limited by the Mexican Government by permit, which all commercial vessels are required to obtain, and entry into certain areas, such as the upper lagoon in Laguna Ojo de Liebre and the middle and upper lagoons in Laguna San Ignacio (Jones and Swartz 1984), is forbidden. Apparently, because of Mexico's policy of revoking permits if there are any transgressions, this system is generally self-policed effectively (Stinson 1988). However, Jones and Swartz (1984) found that in Laguna San Ignacio, where regulations limit the number of vessels to two at any one time, 3 or 4 vessels may occupy the lower lagoon for about 1/2 day when departing vessels overlap with arriving vessels.

To provide additional protection of gray whales within Mexican waters, the Government of Mexico is in the process of implementing its own standards for governing whale watching activities.

A second potential threat to the eastern North Pacific gray whale stock and its habitat is oil and gas exploration and development and related activities along its migration route, in the breeding/calving lagoons in Baja and in or near its feeding grounds in the Bering

and southern Chukchi Seas. Oil and gas exploration, which may result in a short-term loss of habitat for gray whales through displacement by seismic and other activities, is contemplated or under way on the outer continental shelf (OCS) from California to the Beaufort Sea, and west into Russian waters of the Bering Sea throughout the migration range of this species. (In addition, other types of mineral resource development (*e.g.*, gold mining) are under consideration within possible gray whale feeding areas in the Bering Sea). Annually, the gray whale population migrates by or through at least eight oil lease areas within U.S. waters (Rice *et al.* 1984).

Between 1964 and January 1, 1990, over 358 exploration and 692 development wells, have been drilled on the Pacific Region OCS (MMS 1992). All of the development wells and all but 31 of the exploration wells were in the Southern California Bight. In Southern California, 21 platforms have been installed and approximately 135 miles of pipeline have been laid in Federal waters. There are no platforms or pipelines in the Central California, Northern California, and Washington-Oregon OCS.

Nominal exploration and development work will continue in southern California as the number of leases has dropped dramatically to only 116 as of July 1990 (MMS 1991). MMS (1992), for its baseline studies, anticipates that in southern California, approximately 3-4 exploratory and/or delineation wells could be drilled annually, for a total of 25 wells over an eight year period. Approximately 7 development platforms (and pipelines) would be built under this scenario. It appears that only two large and ongoing development projects, the Point Arguello Field and the Santa Ynez units will be placed into production within the next 5 years (MMS 1991). Oil and gas development activities will likely result in a long-term, but considering the small amount of ocean bottom utilized by platforms and pipelines an insignificant, loss of habitat for gray whales.

In Alaska, 87 wells have been drilled, including 2 ongoing wells in the Chukchi Sea and 14 test wells. Thirty-three wells were drilled in the Gulf of Alaska, 30 in the Bering Sea, and 24 in the Arctic. None of these wells resulted in the discovery of hydrocarbons in commercially producible amounts. However, while subeconomic, eight wells demonstrated the positive hydrocarbon bearing potential of the Beaufort Sea area (MMS 1991).

At this time there does not appear to be a high degree of industry interest in the Gulf of Alaska/Cook Inlet area and unless new leases are issued, there will be little operational activity in that area in the next 5- to 10-year period (MMS 1991). Past drilling activity in the St. George, Norton and Navarin Basins has not resulted in any announced discoveries of oil or gas and leases in the North Aleutian Basin have been suspended pending completion of congressionally mandated studies. Although there may be some scattered exploratory activity on existing leases in the St. George, Norton and Navarin Basins, any production is at least 10 to 15 years away, even if a major field were to be discovered (MMS 1991). If a major field is not discovered, little activity would be expected because of the high costs involved and the unproven geologic potential of the area.

In the Chukchi Sea, it is likely that 2 to 3 exploration wells will be drilled each year for the next 5- to 10-year period contingent on results of early wells. One or more major discoveries might accelerate activity while few or no discoveries will curtail activity. While there are some significant discoveries of oil and gas in the Beaufort Sea, whether or not they are developed further may well depend on new discoveries to support the enormous costs of infrastructure to produce and transport oil and gas from Alaska (MMS 1992).

No new lease sales are proposed for Washington, Oregon, or central and northern California before 1997. In southern California no lease sales are contemplated until at least 1996, when 86 blocks in the Santa Maria Basin and Santa Barbara Channel will be considered (MMS 1991). In Alaska, two lease sales in the Beaufort Sea (1993 and 1996), two for the Chukchi Sea (1994 and 1997), two in the Bering Sea (1995 and 1996) and one each in Cook Inlet (1994) and Gulf of Alaska (1995) are proposed, although several additional sales are possible (MMS 1991).

On the winter breeding/calving grounds, oil and gas exploratory areas include sites within and adjacent to present calving and nursery areas, such as the offshore waters of Sebastian Vizcaino Bay, where seismic exploration for gas deposits took place during 1981. To date, no development activities are known to be underway but may take place in the future.

Potential impacts from oil and gas exploration and development include noise disturbance, contact with spilled oil, habitat degradation and possible loss or destruction of benthic prey

populations upon which gray whales depend.

Noise disturbance to gray whales has been studied during their migrations along the California coast (Malme *et al.* 1983 and 1984) and on their breeding/calving grounds in Baja California Sur, Mexico (Dahlheim 1983, 1984; Dahlheim *et al.* 1984). Reactions of gray whales to recordings of industrial noise and to a seismic airgun source during migration have shown that avoidance behavior occurs only at relatively close ranges at decibels greater than 120 dB for continuous noise and 160-170 dB for pulsed sounds such as from airguns (Tyack 1988). Malme *et al.* (1984) for example, found a 50 percent probability of an avoidance response of 2.5 km off central California for a seismic airgun array, 1.1 km for a drillship, and 400 m for a single airgun. However, because noise from oil and gas activities occurs at frequencies that overlap gray whale calling (and assumed hearing) frequencies, they may also influence other behavior causing, for example, interference with socialization, reproductive behavior and communication. For oil and gas activities subject to U.S. jurisdiction, NOAA requires companies under an MMPA 101(a)(5) Small Take Letter of Authorization to take specified precautions to avoid disturbing whales including grays.

Reactions to industrial noises by gray whales studied in their breeding/calving grounds were more pronounced than those found off central California, including vacating the study area during the projection of industrial noises (Jones *et al.* 1991), and changes in the acoustical and observed surface behavior and distribution (Dahlheim 1988). Dahlheim (1988) found that gray whales responded to vessels and to playbacks of vessel noise by: (1) An increase in calling rates; (2) an increase in received levels of sounds; (3) an increase in frequency modulation, number of pulses per series, and repetition rates; and (4) a distinct change in movement, both away from and toward the sound source. In response to a 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. Dahlheim (1988) hypothesized that gray whales engaged in acoustical communication circumvented noise in the acoustical channel by the structure and timing of their calls.

Gray whales may also be sensitive to noise disturbance on their feeding

grounds and might temporarily abandon productive feeding areas if excessively disturbed. MMS (1992) estimates that seismic exploration activities off Alaska would take place from June to September, the same time period gray whales occupy their northern feeding grounds. Reliance on less-productive areas could leave the animals with insufficient body reserves for their successful migration and reproduction. However, because of the gray whale's abundance and range, (and the apparent abundance and range (one million km²) of its primary food source in the Bering Sea), the present gray whale population could likely tolerate without significant effects the short-term and non-recurring local impacts brought on by seismic exploration (NMFS Biological Opinion for Lease Sale 100, dated December 21, 1984).

Another potential threat is the possibility of a major oil spill that would affect a large portion of the gray whale population and/or its habitat; although the temporal and spatial segregation of the stock would tend to expose different segments of the population to oil at any given time. Assuming an oil spill, caused either by a tanker accident, pipeline break, or an oil well blowout, were to occur and contact gray whales, the worst adverse impacts to whales from contact would include death or illness caused by ingestion or inhalation of oil, irritation of skin and eyes, fouling of feeding mechanisms, and reduction of food supplies through contamination or losses of food organisms. Although no data exist at this time, likely direct adverse impacts include: (1) Conjunctivitis and corneal eye inflammation leading to reduced vision and possible blindness; (2) development of skin ulcerations from existing eroded areas on the skin surface with subsequent possibility of infection; (3) compromising of tactile hairs as sensory structures; and (4) development of bronchitis or pneumonia as a result of inhaled irritants (Albert 1981). In general, however, the results of Geraci and St. Aubin (1982, 1985) and Geraci (1990) indicate that whales are likely to suffer only minor impacts if they contact oil spills, and that they are likely to recover from these effects. It is recognized that natural oil seeps have long been a part of the ecosystem that gray whales inhabit. In southern California for example, there are 54 natural seeps, with an approximate discharge of 30,000 tons (7.03x10⁶ gal.) released annually in the Santa Barbara Channel alone (Fischer 1978 as cited in Neff 1990a). Studies on gray whales in

these seeps (Evans 1982), and on bottlenose dolphins in an experimental setting (Geraci 1990), although inconclusive, tend to indicate that cetaceans can detect oil on the surface. When entering oil-contaminated environs, gray whales tend to spend less time on the surface, blowing less frequently, but faster, which may be interpreted as an avoidance behavior, although more testing would be necessary to verify the observation (Geraci 1990). The inhalation of the hydrocarbon products at the water surface is believed unlikely because the breathing mechanism of the whale which prevents inhalation of water would likely also prevent inhalation of oil (Geraci and St. Aubin 1980). However, if the whales enter the immediate vicinity of a recent spill, toxic fumes could be inhaled (Dahlheim n.d.), although 50 percent of the aromatic hydrocarbons (e.g. toluene and benzene) evaporate within a few days of the discharge (Neff 1990a), greatly reducing the toxicity in the spill area.

Because the probable effects on whales from contacting oil include temporary fouling of baleen and toxic effects from ingestion of oil, oil spills may pose a greater problem for the gray whale on its feeding grounds than during its migration. In a laboratory study on bowhead whales (*Balaena mysticetus*), baleen plates fouled by oil had decreased filtering efficiency for at least 30 days, but 85 percent of the efficiency was restored within 8 hours (Braithwaite *et al.* 1983). Due to its coarser and shorter baleen, Geraci and St. Aubin (1982, 1985) demonstrated similar, but somewhat faster, recovery rates for gray whales. Although the toxic effects of ingesting oil remain generally unknown, Geraci and St. Aubin (1990) believe that marine mammals have the liver enzymes required to metabolize and excrete hydrocarbon compounds. This ability limits the accumulation of residues in body tissues and minimizes the probability of residual harm following a spill.

A recent computer model simulating an oil spill projected that gray whales would not contact oil in the Navarin Basin, but would contact oil in the Beaufort Sea ($\leq 0.2\%$ of the population), the St. George Basin ($\leq 1.5\%$) and Chukchi Sea ($\leq 0.8\%$). In the St. George Basin, gray whales would contact oil while navigating to and from their feeding grounds in the spring and fall, while in the Chukchi Sea, they would contact oil during summer feeding months. No more than 1.5 percent of the whales passing through Unimak Pass would contact oil. In general there was a 6.3 percent chance

that at least one gray whale would encounter oil in the Bering Sea during the 30- to 40-year lifespan of an individual oil field (Neff 1990b). MMS (1992) projects the probability of one or more oil spills of 10,000 barrels or greater occurring in the gray whale areas to range from 14 percent in southern California, 21-27 percent in the Bering Sea, 18-34 percent in the Gulf of Alaska to 96 percent in the Chukchi Sea, provided commercially producible amounts of hydrocarbons are discovered and developed.

MMS (1992) gives the probabilities of one or more pipeline or platform spills of 1,000 bbl and greater, and 10,000 bbl and greater as a result of activity in the Chukchi Sea as 92 and 57 percent respectively. In addition, because Chukchi Sea oil will be transported by tanker, there is a 93 and 81 percent probability of one or more spills of 1,000 bbl or greater and one or more spills of 10,000 bbls or greater respectively occurring; although tanker spills would occur outside the Chukchi Sea area since all transport within the area will be by pipeline (MMS 1992). In areas such as the Norton, Navarin and St. George Basins, oil will be transported by tanker to shore facilities in Alaska or other West Coast states. For its base case projections, MMS (1992) predicts one tanker spill for each of these areas developed (over the 30- to 40-year life span of an oil field) but no platform or pipeline spills.

In southern California, MMS (1992) projects a single pipeline spill of 7,000 bbl will result from exploration and development activities in the Santa Maria Basin or the Santa Barbara Channel. In addition, as a result of oil and gas activities in Alaska, 3 tanker oil spills of 30,000 bbl each are projected to occur along the tanker route on the Pacific coast over the 30- to 40-year life span of an oil field: One off Washington, one off northern California and one off southern California. A northern California spill is projected by MMS to occur 80 km or more from the coast with no shore contact.

MMS (1992) anticipates that an oil spill of 10,000 bbl or greater could result in the death of a few individuals and the displacement of gray whales from areas of up to 1,500 km² in the Chukchi and Bering Sea feeding grounds for all or part of a season. (For comparison purposes, the Chirikov Basin is approximately 3.7x10⁴ km²).

MMS (1991) reports that out of a total of 6.2 billion barrels of OCS oil produced from 1971 through 1988, only 900 barrels were spilled from blowouts. However, this statistic excludes the Union Oil spill in Santa Barbara in

January 1969. That spill resulted in a loss of about 3 million gal of oil which eventually covered 800 mi². Surveys conducted as a result of that spill discovered 6 gray whales stranded between January 28 and March 31, 1969. Although these counts were higher than normal, it is unclear whether this was due to the spill or to the increased survey effort (Brownell 1971).

Based upon data resulting from the exploratory wells drilled in recent years in the Bering Sea, MMS (1992) has reevaluated and lowered its estimate of the potential for discovering an exploitable field in the Bering Sea. Based upon MMS' reanalysis, NMFS has determined that the expectation of an oil well blowout occurring and impacting gray whales is low. Essentially, in order for gray whales to be seriously impacted by an oil spill due to oil and gas exploration and development activities, the following events need to occur: (1) A lease sale takes place; (2) exploratory activities determine that economically exploitable quantities of oil can be recovered; (3) development occurs which (4) results in a blowout with a significant loss of oil and (5) the spilled oil intercepts a significant portion of the gray whale population or its food source.

Oil spills, the chemicals used to break up and sink surface oil, and other anthropogenic materials from either oil platforms, (such as drilling muds, discharged materials and produced water), or shore-side discharges from industrial, residential or agricultural point and non-point sources, could also harm gray whales by reducing or contaminating their food resources. Gray whales are opportunistic feeders on a wide variety of benthic amphipod amphipods and other bottom dwelling organisms (Nerini 1984). Most feeding takes place between May and September in the northern waters of the Bering and Chukchi seas, especially in the Chirikov Basin. Some food consumption also occurs during migration and a small portion of the population remains south of Unimak Pass, Alaska, to exploit that resource. Little is believed consumed on the calving grounds (Nerini 1984).

The feeding strategy of gray whales could lead to ingestion of oil from oil-contaminated food, if the prey organisms accumulate petroleum hydrocarbons in their tissue, or from contaminated sediments associated with food sources. The effect of pollutants on the benthic organisms on which these whales feed is relatively unknown, but may result in either direct mortality or sublethal effects that inhibit growth, longevity and reproduction. Benthic organisms could ingest either heavy

metals or hydrocarbons which could bioaccumulate up through the food web. According to sources cited in Neff (1990a), benthic crustaceans have a well-developed mixed-function oxidase (MFO) system to eliminate petroleum hydrocarbons. If amphipods have the ability to detoxify hydrocarbons, these hydrocarbons are less likely to persist and biomagnify in the gray whale food web. Another factor inhibiting bioaccumulation may be the short life span of the amphipods (i.e. <2 years). Therefore, while gray whales probably have a low risk of ingesting petroleum hydrocarbons from their source (see also the earlier discussion on baleen fouling from sediment contamination), benthic amphipods have proven to be quite sensitive to spilled oil and are among the first animals killed after an oil spill (Neff 1990a), which could in turn affect that portion of the gray whale stock feeding in the contaminated area. If they are unable to locate alternative areas with sufficient food resources, they may have insufficient reserves to make the 8,000 km migration to southern grounds, overwintering there and returning the following spring. These animals likely would either remain in waters north of Baja California or succumb from the effects.

Because discharges of drilling muds from offshore platforms may contain heavy metals and other contaminants, all discharges from platforms are regulated by EPA under section 402 of the Clean Water Act. EPA's proposed regulations recommend zero discharges of drilling muds and cuttings and filtration of produced waters. Drilling muds, however, are relatively non-toxic and the metals associated with drilling muds are virtually unavailable for bioaccumulation by marine organisms (Neff 1987). The National Research Council (1985) concluded that the risks to most OCS benthic communities from exploratory drilling discharges are small and result primarily from physical benthic effects. Since ampeliscid amphipods predominate in disturbed bottoms (Nerini and Oliver 1983, Nerini 1984, Oliver *et al.* 1985), are highly motile, and good colonizers, and amphipod recovery is likely to take place within 1 year (Oliver *et al.* 1985), NMFS believes that the gray whale's food source is unlikely to be impacted seriously by the establishment of platforms and pipelines in the OCS.

Preliminary results from the study by NMFS (1990) on contaminants found in gray whales stranded near Puget Sound indicated that heavy metal levels appear to be too low to cause any deleterious effects. In addition, the concentrations of PCBs and DDT were very low

compared to levels in other whales and are below levels known to cause impairment (NMFS 1990). More recent analyses (Varanasi *et al.* in prep.) of 22 gray whales stranded at various locations along the U.S. West Coast, which included those mentioned above, showed no apparent significant differences, between stranding sites, for chlorinated hydrocarbons in the blubber and liver. Analyses of 16 elements in liver, kidney and stomach contents of gray whales were generally low. However, high concentrations of aluminum ($1,700 \pm 450$ ppm), iron (320 ± 250 ppm), manganese (23 ± 15 ppm), and chromium (3.4 ± 1.3 ppm), were discovered in stomachs, although no significant differences were observed between whales stranded in Puget Sound compared to whales stranded at more pristine sites. Varanasi *et al.* (in prep.) noted that the relative proportions of these 4 elements in stranded whales were similar to the relative proportions in sediments, which is consistent with a geological source of these elements from the ingestion of sediment during feeding. The results of their study suggest that the concentrations of anthropogenic chemicals in stranded gray whales show little relation to the level of pollution at the stranding site, and further, showed that the concentrations of potentially toxic chemicals were relatively low when compared to the concentrations in marine mammals feeding on higher trophic level species, such as fish. They noted, however, the lack of data from apparently healthy gray whales limits the understanding of the susceptibility or hardness of this species with respect to levels of anthropogenic contaminants found in tissues.

According to Brownell and O'Shea (in press), levels of organochlorine pollutants that may cause reproductive problems in other mammals are higher than those reported in baleen whales. In addition, the vast majority of the eastern Pacific gray whale stock feeds mostly in colder waters that have been less exposed to organochlorine pollutants (IWC 1990).

Coastal development and coastal and offshore industrial activities may also result in some impacts to the gray whale and its habitat. For example, in the calving lagoon of Guerrero Negro, daily dredging and vessel traffic between 1957 and 1967 for a salt extraction plant reportedly caused the whales to abandon the area. In 1967, the plant was closed and moved to Laguna Ojo de Liebre (Bryant *et al.* 1984). Six years after the dredging and barge activity in Guerrero Negro ceased, gray whales began to return to the lagoon (Gard

1974, Bryant and Lafferty 1980). Since the salt works at Laguna Ojo de Liebre appear to be an environmentally clean industry, with no adverse impacts on the biota of the lagoon (Rice *et al.* 1981), and since the whales appear to tolerate the daily salt-barge traffic and have not abandoned Laguna Ojo de Liebre, daily dredging in the confined Guerrero Negro is more likely the cause of abandonment than the vessel traffic. In addition, exploitation of phosphorus (Cordoba 1981) and the development of a large resort in and near the minor calving lagoons of Bahia Almejas and Bahia Magdalena, if constructed, may be cause for concern. Because of the scarcity of suitable isolated calving and nursery areas for gray whales and the whales' specialized feeding habits, gray whales need to be monitored to determine the effects of future coastal or shallow-water development on any critical stages of the gray whale's life cycle.

The recovery of the gray whale population has occurred concurrent with extensive OCS geophysical exploration off the California coast and other activities throughout its range, and these levels of activity are unlikely to increase significantly in the near future. NMFS, therefore, concludes that current and anticipated levels of human activities do not pose a danger of extinction to this species now or in the foreseeable future. NMFS does not rule out the possibility that parts or all of this stock and certain components of its habitat have been and/or are being stressed or that the effects will not be manifested over time as changes in productivity, mortality or distribution.

Factor (B)—Overutilization for Commercial, Recreational, Scientific or Educational Purposes

As a result of commercial whaling operations, the gray whale was severely depleted by the early 1900's. After 1946, commercial harvesting of gray whales was banned by the International Convention for the Regulation of Whaling. Between 1959 and 1969, a total of 316 gray whales were killed under Special Scientific Permits off California. (A significant amount of gray whale life history data came from these animals (see for example, Rice and Wolman 1971).)

Eskimos living on the shores of the northern Bering Sea and the Chukchi Sea have hunted whales for perhaps several thousand years. Estimated aboriginal takes of the eastern Pacific stock prior to depletion of gray whales ranged from about 156 per year (years 1600–1750) to 186 per year (years 1850–1860) with a period high of 263 per year (years 1751–1850). Subsequent declines

after 1850 were due to reductions in native populations, loss of traditional native cultures under the influence of Western society and reduction of the gray whale stock due to commercial whaling (Mitchell and Reeves 1990, IWC 1990).

In Alaska recently, the catch consists mostly of bowhead whales, with few gray whales being intentionally taken (Marquette and Braham 1992). However, on the Chukotka coast of Russia, the catch has consisted almost entirely of gray whales. Since 1969, when the aboriginal hunt ceased as a result of a large number of "struck-and-lost" whales (Yablokov *et al.* 1984), gray whales have been taken by the Russian Government for the Chukchi Eskimos using one modern catcher boat. The total aboriginal catch in Russia has averaged about 165 gray whales per year since 1967. The current catch limit set by the IWC is 179 per year, 10 of which the United States informed the IWC at the 1991 plenary session that "... it is not requesting and will not in future years request an allocation or use of 10 gray whales" (IWC 1992). In 1990, the Soviet Union requested a three year extension of their quota indicating that this level would satisfy local needs (IWC 1992). This authorized subsistence catch of gray whales is believed to be well below the sustainable yield estimated to be approximately 670 (95 percent confidence: 490-850; IWC 1990) and therefore is not likely to be significantly impacting the stock.

The question has arisen whether non-Alaskan natives would, in the near future, pursue traditional whaling and sealing activities. To date, only the Makah Tribe has expressed such an interest, but it is unclear at this time whether they would be interested in pursuing open-boat whaling or could satisfy subsistence and/or cultural needs by other means. For any Native American group to begin harvesting large whales, they would need to demonstrate a subsistence need and request (through the Bureau of Indian Affairs) the U.S. Commissioner to the IWC to petition that body for a portion of the subsistence quota for gray whales. Such a scenario is considered unlikely at this time.

The question of whether commercial whaling on gray whales would resume in the near future has also been raised. In order for commercial whaling to resume, the IWC would need to reclassify the gray whale as an "initial population stock" (see discussion elsewhere in the preamble), and terminate its whaling moratorium. NMFS concludes that current and anticipated uses for commercial,

recreational, scientific or educational purposes do not pose a danger of extinction to this species now or in the foreseeable future.

Factor (C)—Disease or Predation

The natural mortality rate of the gray whale is low, approximately 0.056 for adults and 0.132 for juveniles (Reilly 1981). There is no information indicating that disease or predation constitutes a threat to the continued welfare of the species.

The killer whale (*Orcinus orca*) appears to be the only non-human predator on gray whales. Evidence from the necropsy of 39 gray whales that stranded on St. Lawrence Island indicated that 16 had been killed by killer whales (Fay *et al.* 1978). The mortality rate from killer whale attacks is unknown. However, the frequency of tooth scars on gray whale carcasses indicates that killer whale attacks are often not fatal.

Moderate numbers of gray whale calves strand in and near the nursery lagoons and along the southern California coast (Swartz and Jones 1983). In addition, a few adults strand every year throughout their range, but the numbers appear low compared with the size of the population (Rice *et al.* 1984). While mortality rates due to stranding cannot be calculated (Rice *et al.* 1984) stranding data may provide insights whether strandings are due to natural or anthropogenic factors.

In 1989, 29 (three possible recounts) gray whales were reported stranded in Alaska from the area from Prince William Sound to the Alaskan Peninsula and into Bristol Bay around the time of the Exxon Valdez oil spill; nine (two possible recounts) of those animals were reported stranded near the southern end of Kodiak Island, southwest and down-current of the oil spill area. While this number was significantly greater than earlier years when only six were documented between Kayak Island and Unimak Pass (Zimmerman 1989), this may be attributed to the timing of the search effort coinciding with the northern migration of gray whales augmented by the increased search effort in the oil spill area (Loughlin, in prep.). In 1990, 26 gray whales were counted off the southern end of Kodiak Island. Surveys of the other areas were not conducted that year. Although some gray whales were reported in 1989 to have oil on their baleen, apparently none had oil in the digestive tract (Moore and Clark as reported in IWC 1990). This is not unexpected considering that dead whales at sea generally float with the ventral surface up and the mouth open.

The relationship between these strandings to the oil spill remains conjectural at this time.

Recent strandings reported along the Washington/Oregon coast have also been higher than the mean for the past 2 years, but as indicated in Table 1 below, not higher than historic records (AFSC stranding data). The majority of the animals stranding in Washington waters in 1990 and 1991 apparently died outside Puget Sound and were carried by currents to the outer coast of Washington and the Straits of Juan de Fuca.

NMFS concludes that disease or predation do not pose a danger of extinction to this species now or in the foreseeable future.

TABLE 1. RECENT STRANDING ALONG THE WASHINGTON/OREGON COAST

Year	Number	Year	Number	Year	Number
1983	8	1984	15	1985	2
1986	2	1987	9	1988	10
1989	4	1990	15	1991	12
1992	*3				

* To date.

Factor (D)—Inadequacy of Existing Regulatory Mechanisms

Existing laws and regulations are considered adequate for the conservation of the gray whale. Under the protection of the IWC, the MMPA and the ESA, the eastern North Pacific gray whale stock has recovered to near or above its estimated pre-commercial exploitation population size. Most of the protective measures for the gray whale would remain even without listing under the ESA. The gray whale would remain protected in the United States under the MMPA and the Whaling Convention Act, internationally under the International Convention for the Regulation of Whaling, as well as under national legislation in Canada, Mexico, and Russia, although the effectiveness of this legislation is not fully known.

Mexico has particularly detailed legislation protecting the calving lagoons from disturbance (Klinowska 1991). In 1972, 1975, and 1979 respectively, the Mexican Government designated the major calving lagoons of Laguna Ojo de Liebre, Laguna Guerrero Negro, and Laguna San Ignacio in Baja California as gray whale refuges. These refuges account for approximately 73 percent of calf productivity and are the lagoons that most of the U.S. tour boats and private tourists visit. The number of vessels allowed in these lagoons at any one time is limited by permit to two vessels at a time, and entry into the middle and upper (Ojo de Liebre and

San Ignacio) and upper (Guerrero Negro) lagoon areas is forbidden from December 15 to March 15, although as documented by Jones and Swartz (1984) at Laguna San Ignacio, compliance is not absolute. Mexico issues individual permits to each vessel which specify the number of days a vessel may remain within the lagoon, the number of passengers it may carry, the number of skiffs it may launch and the kinds of activities permitted, such as whale watching, shore exploration, etc. (Jones and Swartz 1984). Violation of the permit requirements leads to a revocation of the permit. In order to provide additional protection for gray whales within Mexico waters, the Government of Mexico is in the process of implementing its own standards for governing whale watching activities. However, the level of enforcement in the Mexican lagoons is not fully known at this time.

Although unclassified in the "Red Book" (i.e. not listed as threatened) by the International Union for the Conservation of Nature (see Klinowska 1991), additional protection is afforded internationally under the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). CITES was created to prevent species from becoming threatened through international trade (Wells and Barzdo, 1991) and prohibits commercial trade in seriously threatened species, which are listed in CITES Appendix I. Trade in Appendix I species, such as the gray whale, may be authorized only in exceptional circumstances (e.g., scientific research), and provided the import is not for commercial purposes. All international shipments must be covered by an export permit from the country of origin and an import permit from the country of destination. There is no indication that any change in the gray whale's status under CITES is contemplated by any of its members and any change in status would require a majority vote of the member nations.

In the United States, irrespective of the outcome of this action, activities that take marine mammals are prohibited unless authorized or exempted under the MMPA. The incidental take of marine mammals may be authorized in limited circumstances under an MMPA small take exemption. Oil and gas exploration activities, for example, are eligible to apply for a small take exemption under section 101(a)(5) of the MMPA. Under a Small Take Exemption, NMFS requires the oil and gas industry to take appropriate measures to minimize impacts to gray whales and to conduct exploration activities in such a way as to reduce the

likelihood of adversely affecting the gray whale. The Letters of Authorization also include requirements for monitoring and reporting. For the 1991/92 exploration season, NMFS issued five Letters of Authorization (50 FR 47742, Sept. 20, 1991) but only one for the 1992/93 season. NMFS annually reviews the conditions under which these Letters are issued to ensure that gray whales, other marine mammals and their habitats remain adequately protected.

While section 7 consultations under the ESA would cease for the gray whale once the eastern stock is delisted, coastal habitat critical for the continued well-being of the gray whale would be protected within waters under the jurisdiction of the United States through other laws such as the National Environmental Policy Act, the Clean Water Act, MARPOL (the Anti-Dumping Act), the Marine Protection, Research and Sanctuaries Act, (ocean dumping), sections 10 and 404 of the Rivers and Harbors Act of 1899 and the Oil Pollution Act of 1990 which will require, among other things, double-hulled tankers within U.S. waters by 2015. Consultations will also continue under the Outer Continental Shelf Lands Act Amendments.

NMFS concludes that the anticipated regulatory mechanisms are adequate for the conservation of this species.

Factor (E)—Other Natural or Man-made Factors Affecting its Continued Existence

In addition to those man-made factors affecting the gray whale's continued existence which were discussed under Factors A and C above, gray whales are also impacted by incidental take in commercial fishing operations.

The fact that gray whales migrate in a narrow, nearshore corridor where commercial fishing activities are concentrated leads to encounters and entanglement in gear from several commercial fisheries. Norris and Prescott (1961) document entanglement in gillnets since the late 1950s. Data from the NMFS-administered stranding networks document that commercial gillnet fisheries take gray whales incidental to fishing. NMFS' Southwest Region has maintained records of reported gray whale entanglements in California gillnet fisheries since the 1984/85 migration. The number of entanglements has varied from a low of seven entanglements and no mortality during the 1985/86 migration to a high of 15 entanglements and three mortalities during the 1986/87 migration. The number of entanglements and deaths declined

during the 1987/88 migration to seven entanglements and one mortality. This reduction in entanglements may have been due to regulations implemented by the State of California in the fall of 1987 that require fishermen to construct their nets so that whales can break through them and that prohibit fishing near major whale concentrations. However, no study was conducted to quantify the effectiveness of these regulations and the decline in entanglement could be due to natural variation. In 1990 and 1991, no gray whales were reported entangled in gillnet fisheries in California (Perkins and Barlow 1992).

It should be recognized that under the MMPA, the incidental taking of endangered, threatened or depleted species was illegal until 1989, making the fisherman subject to penalty. It is presumed that the potential for prosecution may lead to underreporting of incidental takings. In 1988, amendments to the MMPA authorized the incidental (but not intentional) taking of depleted species during commercial fishing operations under section 114 of the MMPA until October 1, 1993. However, under the ESA, takings of endangered species incidental to commercial fishing operations cannot be authorized under section 7 of the ESA, leaving the issue unresolved. The NMFS legislative proposal to Congress to govern fisheries after October 1, 1993 (see 56 FR 23958, May 24, 1991) proposes to authorize a limited incidental take of depleted, threatened or endangered species and to amend the MMPA to authorize takes incidental to commercial fishing activities under section 101(a)(5). Under that proposal, all provisions of the ESA would apply as well. That proposal, if implemented by law, however, would not likely result in an increase in gray whale mortality, since commercial fisheries would be regulated through seasonal, area or gear restrictions to reduce marine mammal mortality to insignificant levels approaching a zero rate. In addition, observers could be placed onboard vessels operating in any fishery that takes marine mammals and quotas would be enforced through fishery restrictions based upon observer reports.

The California Department of Fish and Game (CDF&G) observed one entangled balaenopterid (probably a minke whale) during 177 observer days spent monitoring the shark and swordfish drift net fishery in 1980. CDF&G's southern California set-net monitoring program monitored about 5 percent of the fishing effort from 1983 through 1986 and observed no gray whale entanglements (Collins *et al.* 1984, 1985, 1986; Vojkovich *et al.* 1987).

Likewise, CDF&G set-net observers in northern California reported no gray whale entanglements during monitoring of about 1 percent of the fishing effort from 1984 through 1987 (Wild 1985, 1986).

In the Pacific Northwest, gray whales have been observed entangled in salmon set-nets off northern Washington and in crab pot lines off Oregon. These entanglements are infrequent, occurring once every 1 to 3 years in the set-net fishery and once every 3 to 5 years in the crab fishery (NMFS 1991).

Heyning and Dahlheim (in press) reported on strandings and incidental takes of gray whales from Alaska to Mexico for the years 1975-1988. Gray whale strandings were examined carefully to document whether the animal had been entangled in fishing gear. Some known fishery kills of gray whales bore no evidence of entanglement after stranding, despite thorough examination (Heyning and Lewis 1990). Data from the Heyning and Lewis study suggested that (1) sexually immature animals represented 90 percent of all strandings; and (2) gray whale mortality related to fisheries interactions is likely insignificant relative to the present population size.

Minimal estimates of fisheries-related mortality for stranded gray whales ranged from 8.7 to 25.8 percent (Heyning and Dahlheim in press). None of the 20 animals documented in that report from Alaskan feeding grounds had indications of entanglement in fishing gear. In the Gulf of Alaska and Alaskan Peninsula area, four animals out of 29 (13.8 percent) that stranded were involved in fishing gear. Baird *et al.* (1990) reviewed the available information for British Columbia and found four animals out of 39 strandings (11.1 percent) were involved in fishing gear. They noted that if they included only the 15 strandings that were carefully examined, then 26.7 percent of mortalities were fisheries related.

The fisheries related mortality for Washington, Oregon and northern California are eight out of 50 (16 percent), two out of 23 (8.7 percent), and six out of 47 (12.8 percent), respectively. In southern California, more carcasses have been examined thoroughly and 25 out of 92 (25.8 percent) were mortalities related to fishing operations. Heyning and Lewis (1990) have reviewed baleen whale entanglements in this region and found that the majority of gray whale entanglements involved immature animals but not calves. Almost two-thirds of these entanglements occurred during the northbound migration.

Based upon the information acquired to date, but recognizing the scarcity of that information, NMFS concludes that gray whale mortality related to fisheries interactions is likely insignificant relative to the present population size.

NMFS concludes that there are no known or anticipated other natural or man-made factors that pose a danger of extinction to this species either now or in the foreseeable future.

Consultations under Section 7 of the ESA

A chronology of consultations with MMS on oil and gas activities and NMFS' assessed impacts on gray whales was published in the proposed rule (56 FR 58869, November 22, 1991). Please refer to that document for further information on this subject. A copy of the reanalysis of the biological opinions on the impacts of oil and gas activities, which was based on information and data described in this final determination, is available upon request (see ADDRESSES). See also the discussion under Factor (A) above.

Discussion

An endangered species is any species that is in danger of extinction throughout all or a significant portion of its range; a threatened species is any species that is likely to become an endangered species within the foreseeable future. The ESA requires that any determination that a species is endangered or threatened be made solely on the basis of the best available scientific and commercial information concerning that species relative to the five factors discussed above.

The eastern North Pacific stock of the gray whale has recovered to near or above its estimated pre-commercial exploitation population size. It is estimated to be between 60 and 90 percent of its carrying capacity and will probably continue to increase until density dependent factors slow the rate of growth. NMFS therefore believes that this stock is not currently in danger of extinction throughout all or a significant portion of its range. Moreover, even though the eastern Pacific gray whale stock inhabits coastal waters that are increasingly impacted by human activities, the stock continues to increase and, therefore, is not likely to become an endangered species again within the foreseeable future throughout all or a significant portion of its range. Based upon the assessments discussed above, NMFS believes that individual and cumulative impacts, while they may have the potential to affect adversely the eastern North Pacific gray whale stock, are not likely to jeopardize

its continued existence. Therefore, NMFS believes the eastern North Pacific stock of the gray whale should be removed from the List of Endangered and Threatened Species under the ESA.

Some commenters contend that although the stock is not currently threatened, human activities have the potential to threaten the stock in the future. For the most part, they fear that the IWC may allow the resumption of commercial whaling; that oil and gas exploration either planned or under way along the continental shelf could seriously harm whales that use these coastal areas; and that potential cumulative impacts may, in the future, threaten the gray whale's survival. However, potential future threats, as opposed to actual, present-day threats, are neither sufficient to justify listing a species nor sufficient for retaining a recovered species on the List according to the factors that must be considered under the ESA. If they were, then, as noted by Brownell *et al.* (1989), " * * * the majority of the world's animals would have to be included on the List, as large numbers of species are potentially threatened by the growth of human populations, current rates of habitat destruction, and other harmful activities." NMFS believes that the increasing abundance of this stock, in close proximity to human coastal development, industrial activity and vessel traffic, suggests that this stock has the resiliency to adjust to human activities with few apparent adverse effects.

However, because the gray whale is exposed frequently to human activities, and cumulative impacts may result in some indirect effects, long-term monitoring of the status of the gray whale stock will be conducted (see Monitoring below).

Removing the eastern North Pacific gray whale stock from the List will not result in a major reduction in protection. While the protections and prohibitions of the ESA, including the consultation requirements of section 7, will cease to apply, the gray whale will remain subject to prohibitions against taking under the MMPA. Habitat concerns will continue to be addressed under several other laws. In addition, because the species also remains protected under the U.S. Whaling Convention Act and the International Convention for the Regulation of Whaling, the number of gray whales authorized to be taken for subsistence purposes will continue to be limited by the IWC.

NMFS also believes that the western Pacific gray whale stock, which is geographically isolated from the eastern

stock, has not recovered and should remain listed as endangered.

Coordination

In accordance with section 4(a)(2) of the ESA, NMFS requested the concurrence of the Department of the Interior on this proposal when it was published on November 22, 1991. Concurrence on the proposal was received in a letter dated March 4, 1992. As the FWS maintains and publishes the List in 50 CFR part 17 for all species determined by NMFS or FWS to be endangered or threatened, the FWS is encouraged to promulgate a rule amending the List by removing the "gray whale" and replacing it with the "Western Pacific (Korean) gray whale." Upon completion, NMFS will implement a rule to remove the gray whale from the list of species found in 50 CFR 222.23. NMFS encourages the FWS to take timely action on this request and will assist the FWS to the greatest extent possible.

Monitoring

Section 4(g) of the ESA requires that whenever a species is removed from the List, the Secretary must implement a system, in cooperation with the states, to monitor effectively the status of any species that has recovered to the point where the protective measures provided under the ESA are no longer necessary. This monitoring program will continue for at least 5 years and, if at any time during that period the Secretary finds that the species' well-being is at significant risk, the ESA (section 4(b)(7)) provides that emergency protective regulations must be issued to ensure the conservation of any recovered species.

As part of its monitoring program, NMFS intends to create an internal Task Group responsible for monitoring activities potentially impacting gray whales. This Task Group will consist of NMFS marine mammal scientists familiar with either gray whale biology or related subject matter and will be expected to coordinate internal research on gray whales, encourage independent research in areas not currently funded or investigated by NMFS, and serve as a quick response advisory team in the event of any catastrophic event impacting gray whales. The Task Group will also recommend to the Assistant Administrator for Fisheries, NOAA (Assistant Administrator) appropriate steps, necessary to mitigate any catastrophic event, including the reimposition of emergency protective measures. Finally, within 6 months following the conclusion of the first 5-year monitoring program, the Task Group will conduct a comprehensive

"status review" of the gray whale that will be forwarded to the Assistant Administrator for approval and release to the general public for review and comment. The Task Group will review and address the comments in drafting a final report. Included in that report will be a recommendation on whether (1) to continue the monitoring program for an additional 5 years; (2) terminate the monitoring program; or (3) reconsider the status of the gray whale under the ESA. In the intervening year between the conclusion of the first 5-year monitoring program and release of the final report, NMFS will continue with its monitoring program.

Although recognizing current budgetary restraints, NMFS encourages the MMS and other Federal agencies to continue studies on gray whale distribution, abundance, and habitat use in the Bering, Chukchi, and Beaufort Seas and on the impacts of seismic exploration, offshore drilling activities, oil spills, and vessel traffic. In addition to research on gray whales conducted in the United States through independently funded sources and in Mexico by the Government of Mexico, NMFS plans to conduct the following as part of its monitoring program:

- (1) Monitor the status of the gray whale and habitats essential to its survival:
 - (a) Conduct a biennial population assessment to include:
 - (i) A census of the southbound migration for comparison with historical research;
 - (ii) Carry out research as needed to determine any potential biases in the estimation of procedures (e.g., offshore distribution, tails of the migration, night-time migration rates);
 - (iii) Estimate population productivity using data obtained from (i) and (ii) above, and from life history studies, as may be appropriate, such as calf production; and
 - (iv) A determination of the shape of the production curve of the population—that is, the "point" or series of estimates that suggest that the population has reached its carrying capacity.

(2) Continue monitoring the level and frequency of gray whale mortality through small take and commercial fishery exemptions, stranding programs and other activities.

(3) As part of the stranding network, monitor trends in the levels of contaminants, including hydrocarbons, organochlorines, heavy metals and DDT, in gray whales by conducting bioassays of all available stranded animals.

In addition to its required monitoring program, NMFS anticipates taking the

following actions to ensure the continued well-being of gray whales:

- (1) Implement whale watching regulations for U.S. citizens and others within the U.S. EEZ and promote with Mexico and Canada the use of similar standards for whale watching within their waters.
- (2) To the extent possible, encourage MMS to continue studies to determine the impacts of oil spills; vessel traffic, including noise; seismic exploration; and offshore drilling activities on gray whales and their benthic food resources.
- (3) To the extent possible, continue and promote increased cooperative studies with Mexico to monitor habitat use and the impacts of whale watching on the Mexican breeding/calving grounds; encourage the enforcement of gray whale sanctuary regulations in Mexico; and encourage operators of U.S. whale watch vessels to observe Mexican sanctuary regulations.
- (4) Continue participation in the IWC and its Subcommittee on Protected Species and Aboriginal Subsistence Whaling, in order (among other things), to coordinate research on gray whales by member nations, in particular surveys of western Pacific areas for estimating abundance of the Okhotsk stock, photo-identification studies, and DNA/carbon isotope work.

References

A copy of the references used in this document is available upon request (see ADDRESSES).

Determination

Based upon the assessments discussed above, NMFS has determined that the eastern North Pacific gray whale stock has recovered to near its estimated original population size and, while individual and cumulative impacts may have the potential to affect adversely the eastern stock, that stock is neither in danger of extinction throughout all or a significant portion of its range, nor likely to again become endangered within the foreseeable future throughout all or a significant portion of its range. Therefore, NMFS has determined that the eastern North Pacific stock of the gray whale should be removed from the List of Endangered and Threatened Species under the ESA. NMFS has also determined that the western Pacific gray whale stock, which is geographically isolated from the eastern stock, has not recovered and should remain listed as endangered.

Dated: December 30, 1992.

William W. Fox, Jr.,

Assistant Administrator for Fisheries.

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