

MEMORANDUM FOR: F/PR - Laurie K. Allen

FROM: F/PR1 - Stephen L. Leathery

SUBJECT: Report on the Application for a Scientific Research Permit, submitted by Dr. Peter J. Stein, Scientific Solutions, Inc., Nashua, New Hampshire, [File No. 1048-1717-00]: Recommendation for Issuance

Abstract

Dr. Peter J. Stein, Scientific Solutions, Inc., Nashua, New Hampshire, requests a permit to expose gray whales (*Eschrichtius robustus*) migrating offshore of central California to low-powered high-frequency active sonar, henceforth referred to as "whale-finder sonar systems," while simultaneously recording any reactions of the animals to the sound. In addition to the target species, which is not listed under the ESA, the applicant also requests authorization for unintentional "takes" of other non-target marine mammal species that may be within the range of the whale-finder sonar systems, including endangered blue, fin, sei, sperm, and humpback whales, and threatened Steller sea lions and Guadalupe fur seals. The objectives of the proposed research are to gather data on the reflectivity of whales, determine the probability of detection out to one mile, and determine what, if any, reaction the animals may have to high frequency active sonars designed to detect marine mammals. The purpose of the proposed research is to validate and improve the ability of whale-finder sonar systems to detect marine mammals without adversely affecting them.

NOTE: During review of the application and preparation of an Environmental Assessment (EA), it was determined that the probability of blue, fin, sei, humpback or sperm whales being present in the study area at the time of the proposed research was too low to predict. It was also determined that, with the exception of sperm whales, these endangered whale species would not likely be able to hear the whale-finder sonars or otherwise be affected. Thus, NOAA Fisheries has chosen not to issue a permit for takes of these species since none are likely. Similarly, the probability of a Guadalupe fur seal or Steller sea lion being present in the study area at the time of the proposed study was determined to be too low to predict so no takes would be authorized for these threatened species.

Chronology

May 15, 2003	Date of application
May 15, 2003	Application received complete

November 5, 2003 Application published in the Federal Register
November 5, 2003 Application distributed
December 5, 2003 Close of public comment period
December 10, 2003 Marine Mammal Commission comments received
December 15, 2003 Concurrence from USFWS received
December 23, 2003 Concurrence from Endangered Species Division received
December 23, 2003 Finding of No Significant Impact signed

Comments

The Marine Mammal Commission (MMC) believes “the proposed research is important and will contribute to our knowledge concerning the efficacy of whale finding sonar and its effects on marine mammals.” MMC recommended approval of the application provided that:

- Research activities directed at a marine mammal be discontinued if the animal exhibits behaviors indicating a strong reaction or risk of injury during or after an acoustic experiment; and
- the Service ensure that activities to be conducted under the permit and those of other permit holders who might be carrying out research on the same species in the same areas are coordinated to avoid unnecessarily duplicative research and unnecessary disturbance of animals.

The MMC has suggest that the applicant collect information on the response of marine mammals to the ramp-up procedure whenever possible because “the empirically derived information concerning the effectiveness of ramp-up has not been developed and may vary with a range of factors.”

The MMC believes that the activities for which it has recommended approval are consistent with the purposes and policies of the Marine Mammal Protection Act (MMPA).

PR1 response: The permit contains conditions addressing the above issues. Specifically, Condition B.2.b states “If any marine mammal exhibits behaviors indicating a strong reaction to the whale-finder sonars, either during or immediately after exposure to the sounds, research activities directed at that animal must be discontinued.” Condition C.1 requires the Permit Holder to notify the Southwest Regional Administrator prior to initiation of the research and Condition C.3 requires the Permit Holder to coordinate research authorized in the permit with other researchers conducting the same or similar studies on the same species, in the same locations and at the same time.

Dr. Stein has stated that the observers will collect data on marine mammal behaviors during the study but notes that none are anticipated. In the case of the target species, NOAA Fisheries points out that, as discussed in the draft EA

provided to the MMC, most if not all of the sounds will be inaudible so no reaction is likely. For any other marine mammals that may be in the action area (i.e. small cetaceans, pinnipeds, and sea otters), no reaction is likely because the sounds from the whale-finder sonars will be so similar to the countless other high-frequency sonars (fish-finders and depth-sounders) to which they are already exposed and because the duration of exposure to whale-finder sonar sounds would be negligible compared to these existing sounds.

Public Comments: Written comments on the application and/or draft Environmental Assessment were received from the Natural Resources Defense Council (NRDC), the American Cetacean Society (ACS), the Whale and Dolphin Conservation Society (WDCS), and Mr. Lanny Sinkin. The WDCS comments were received after the close of the public comment period but NOAA Fisheries has chosen to consider them in making its decision on Dr. Stein's permit application. Copies of all comments are attached.

The NRDC did not comment on the substance of the application or draft EA but did express concern that NOAA Fisheries would apply the new definition of harassment (Pub. L. No. 108-136, §319(a) (2003)) to the proposed research.

PR1 response: The new definition of harassment became law during the public comment period for Dr. Stein's application. NOAA Fisheries is in the process of determining the implications of this new law for scientific research permits under section 104 of the MMPA. While the new definition may apply to the proposed action, given that the permit application was pending at the time of the change in the law, NOAA Fisheries is processing the application under the definition of harassment in the MMPA (16 U.S.C. 1362 3(18)(A)).

The ACS commented on the status of the gray whale population, noting that the draft EA did not use the latest population estimate, which is "now well below what it was when it was removed from the Endangered Species list in 1994."

PR1 response: NOAA Fisheries has updated the section in the EA on population abundance estimates to reflect the most recent point estimates for that population and has included a reference to a study in press (Rugh *et al.*, Estimates of abundance of the eastern North Pacific stock of gray whales 1997 to 2002) on the status of the population. A revised minimum abundance estimate¹, which is the number in the draft EA to which ACS refers, is not yet available. This study supports the statements in the draft EA regarding the likelihood that the gray whale population is at or near carrying capacity. However, as was stated in the draft EA, there is no scientific information to suggest that the proposed research will adversely affect the gray whale population, regardless of its size or status.

¹ Note that a "minimum population estimate" (N_{MIN}) is not the same as a point estimate derived from a stock survey. N_{MIN} is calculated using an equation in Wade and Angliss (1997) and represents a conservative population estimate. In other words, there is a high statistical probability that there are at least as many animals as N_{MIN} . With a point estimate, there is a roughly equal probability that there are fewer animals or more animals than estimated from the survey data.

The ACS expressed concern about the potential impacts of high-frequency sonar on gray whale calves and pregnant females. They suggested Dr. Stein consider conducting the study on the gray whales' summer feeding grounds "where the potential for disturbing nursing cow-calf pairs is virtually nil and a more equal number of adult males and females can be studied."

PR1 response: As was stated in the draft EA, it is not likely that the whale-finder sonars will have an effect on gray whales, whether they are adults, calves, pregnant females, etc. because most, if not all, of the sound will be inaudible to them, the duration of the sounds is brief, and the received level will be 180 dB or less. There is no potential for physical injury or even temporary threshold shift from the proposed study. Further, as was stated in Dr. Stein's application and the draft EA, the proposed study site was chosen for a number of reasons including the predictable passage of a large number of gray whales. The intent of the study is to validate the ability of the whale-finder sonars to detect marine mammals. For this, a predictably large enough sample size of whales passing at various angles is needed and the proposed study site is ideal for this. As stated above and analyzed in the draft EA, the likelihood that gray whales, including cow-calf pairs, will be disturbed by the whale-finder sonar sounds is extremely low given that most if not all of the sound will be inaudible to them. Further, since the proposed research is not a study of the gray whales themselves, the sex ratio of animals is irrelevant.

The ACS commented on a perceived discrepancy between the application and the draft EA in the number of gray whales that would be exposed during the study.

PR1 response: The difference in numbers between the application and the description of the proposed action in the draft EA was intentional. As the title of the table in the draft EA clearly explains, "for some species, maximum numbers of individuals that may be ensounded under the Proposed Action may not correspond to the numbers in Dr. Stein's application. Based on stock abundance and distribution information, as well as the season, duration, and probable sound propagation for the proposed action, NOAA Fisheries has modified the numbers for some species."

The ACS states that the number of gray whales that may be ensounded represents 7% rather than 5% of the population which "hardly constitutes a "small take" of any species, listed or not."

PR1 response: As noted above, NOAA Fisheries has updated the EA with the most recent point estimates for the gray whale population. We reiterate that the actual number of gray whales in the population does not change the determination that most if not all of the sounds of the whale-finders will be inaudible to gray whales and that the proposed study is not likely to have a significant effect on the population or the environment. Since neither the application nor the draft EA

refer to “small take” the ACS reference to “small take” is apparently the result of some confusion about the difference between a scientific research permit issued under section 104 of the MMPA and “small take authorizations” issued pursuant to section 101(a)(5) (A-D) of the MMPA. Small take authorizations are for the incidental taking, but not intentional taking, of small numbers of marine mammals by U.S. citizens who engage in a specified activity (other than commercial fishing) within a specified geographic region. Scientific research permits issued under section 104 are for intentional taking and are not limited to small numbers.

The ACS notes that there is “a proposed Marine Protected Area -- Pt. Buchon State Marine Conservation Area -- that is scheduled to be submitted to the California Fish & Game Commission no later than January 1, 2005.” ACS states that the action area for Dr. Stein’s proposed study is adjacent to this proposed site and notes that “there is no mention of any contingency plans to move the study should this [State Marine Conservation Area] be created within the 5-year study period.”

PR1 response: The issue of a proposed or potential Marine Protected Area is beyond the scope of the scientific research permit process. However, should new information be presented that would affect the outcome of the analysis in the EA, NOAA Fisheries would re-evaluate its decision and amend the permit as appropriate.

The ACS state that “[w]hile the draft EA dismisses the possibility of impacts to ‘essential fish habitat’ and that the proposed action ‘may not elicit any response from any fish species,’ the scientific literature indicates otherwise.”

PR1 response: The ACS has not cited any specific scientific literature in support of this statement, nor is NOAA Fisheries aware of any. Thus, NOAA Fisheries maintains that the proposed study will not adversely impact essential fish habitat or fish species within the action area.

The ACS states that the literature “frequently shows fish freezing in place as a ‘fright response’ to unknown sound, thus keeping them in the ensonified area and subject to injury if not death.”

PR1 response: The ACS has not cited any specific literature in support of this statement thus it is not possible for NOAA Fisheries to evaluate the validity of this claim. However, as was stated in the draft EA, the sounds produced by the whale-finder sonar are not capable of causing injury or death. In addition, as referenced in the draft EA, some fish were observed to form tighter schools and moved away from playback of sounds from 110-140 kHz at levels above 160 dB re 1 μ Pa to 180 dB re 1 μ Pa.

The ACS refer to anecdotal evidence in a commercial publication about whale-watching in which “a spotter pilot for a commercial fishing boat” stated that he had “come to associate [a whale stopping swimming for no apparent reason and acting as if confused]

with the use of electronic depth sounding devices by boats within a half-mile of the whale.”

PR1 response: NOAA Fisheries analysis of the best available scientific information about gray whale auditory capabilities indicates that most if not all of the sounds produced by the whale finder sonars would be at or above the auditory threshold of gray whales and would, therefore be inaudible. Further, the sounds from the whale-finder sonar study would be brief and represent an insignificant amount of the total sound in the whales’ acoustic environment. In addition, even though it is neither likely nor expected that gray whales would be affected by the sonar sounds, the study would employ mitigation measures, as discussed in the application and draft EA, to ensure that there were no adverse impacts.

The ACS states that “[i]t is specious to imply that the only thing standing between whales and certain injury or death is a sonar that has the capability to inflict both.”

PR1 response: The ACS has apparently misunderstood or misinterpreted statements in the draft EA. By linking a generic statement about no action alternatives in the introduction to Chapter 2 of the draft EA to a specific statement about the No Action alternative in section 2.1 of the draft EA, ACS has assumed NOAA Fisheries was attempting to “coerce commenters with an implied threat.” The intent of the draft EA was to evaluate the potential impacts of the proposed study on the environment. NOAA Fisheries has not employed the document as a form of coercion or threat. Further, as was stated in the draft EA, analysis of the best available information on the propagation of sound in water and hearing and anatomy of marine animals indicates that the whale-finder sonars are not capable of inflicting injury or causing death.

The ACS states that “by supporting a ‘No Action’ alternative, we are not stating that further study on the effects of anthropogenic sound in the marine environment is not warranted. What we are stating is that this EA is inadequate for the purposes for which it was intended, does not address the District Court’s concerns, and that the inconsistencies in the data used, the lack of citation for any number of speculations, only a few of which we’ve enumerated here, and the targeting of pregnant and/or nursing migrating animals are grounds for NMFS rejecting this Permit Application.”

PR1 response: NOAA Fisheries believes the draft EA was an adequate evaluation of the potential environmental impacts of the proposed study and that none of the comments submitted by ACS prove otherwise. The draft EA has addressed all the relevant issues raised by the Court in its decision regarding amendments to Dr. Tyack’s Permit No. 981-1578. NOAA Fisheries has discussed what ACS considers inconsistencies in the data in the above responses. The draft EA does not make unsubstantiated speculations but does draw logical conclusions based on analysis of available credible scientific information. As was stated in the draft EA and discussed above, there is no evidence that the whale-finder

sonars will have an adverse effect on gray whales, including pregnant and/or nursing animals.

The WDCS states that use of the whale-finder sonar “has the potential to expand rapidly if it is determined to be a more effective mitigation device than currently available (and consisting primarily of visual observations and passive acoustics - both of which have their limitations). We appreciate the potential value of any new and innovative approach that can provide us with more certainty of the whereabouts of cetaceans within the immediate vicinity of activities involving intense noise pollution. However, we would like to explore the full implications of operation of such a device including its potential environmental impact.”

PR1 response: NOAA Fisheries cannot speculate on the degree of potential future use of the whale-finder sonars if the validation study is successful. We agree with ACS that there is a potential conservation benefit to development of the whale-finder sonars. The draft EA was an analysis of the potential environmental impacts of the proposed study.

The WDCS states that their “primary concern with the proposed use of the whale-finder sonar system is that it is clear from the permit application that [it] is intended to primarily be a mitigation sonar for military sonar systems.”

PR1 response: The military already has the High Frequency Marine Mammal Mitigation Sonar (HF/M3) for its use. The main purpose of the whale-finder sonars that are part of the proposed action would be as mitigation for other human activities such as operation of airgun arrays in seismic exploration, shock testing, and other underwater explosions. According to the Dr. Stein, the whale-finder sonars that are part of the proposed action are different from the HF/M3 in a number of ways. Both the MAST Mechanical System (a version of the HF/M3 system that is installed with SURTASS LFA) and the IMAPS system work by forming beams that look out in all directions. The manner in which they forms beams is different such that the HF/M3 works fine in deep water and for its particular application, but is not expected to work that well in shallow water. The HF/M3 system is used in areas where there will be very few other objects. The IMAPS system is meant to be used in areas where there are many other objects.

The WDCS state that the use of whale-finder sonars “involves introducing more noise into the marine environment, and potentially considerably more noise. In fact, such is the source level of the proposed mitigation device, that we note that it has its own mitigation procedures that must be applied before it can be used, including widely employed measures such as ‘ramp-up’.”

PR1 response: As discussed in the draft EA, the amount of additional noise resulting from the proposed study would be negligible compared to the existing baseline. In terms of future use of the whale-finder sonars as mitigation for activities such as seismic exploration and underwater explosions and whether

operation of a whale-finder sonar in conjunction with these activities would have a significant impact on the environment, NOAA Fisheries notes that those sort of activities require authorizations that are themselves subject to analysis under NEPA. Without knowing which, where, how many, how often, etc. these activities would employ whale-finder sonars, NOAA Fisheries cannot even speculate on how the whale-finder itself would or would not significantly contribute to the amount of noise resulting from these operations. However, use of the whale-finder sonar, which itself is not likely to result in injury, mortality or even temporary threshold shift, in conjunction with these activities could prevent serious injury and mortality of marine mammals from occurring. The mitigation measures for the proposed research permit are extremely conservative and their use does not imply that NOAA Fisheries anticipates significant adverse impacts from the study. Out of an abundance of caution, NOAA Fisheries has included these measures, including some suggested by the applicant, to ensure that there are no adverse effects of the research on marine mammals.

The WDCS notes that the potential applications of the whale-finder sonars are diverse and that the proposed study will “undoubtedly lead to others” and question why Dr. Stein has not requested to conduct additional studies, presumably in other locations.

Applicant response: In an email of December 17, 2003, Dr. Stein has indicated that he will undoubtedly want to do testing in other areas with other species, as was indicated in his application. Dr. Stein stated: “its clear that each test location, and each species that we are directing the test against, will require additional modifications to the current permit. However, we are doing a first-of-a-kind test with a prototype system. We do not yet know exactly what will be gleaned from this test, what future systems will look like, and what other testing will need to be done. There are an infinite number of scenarios. We therefore could not put together an application that could be adequately reviewed by NMFS for future studies. We should also note that future IMAPS systems will likely have look-down capability to protect against animals coming straight up from under an operation.”

The WDCS states that they are concerned that “the device intended to mitigate the original impact may also have an impact on some species, and especially odontocetes. In particular, sperm whales and beaked whale species...may be the species that are most vulnerable to the impacts of noise pollution.”

PR1 response: As noted in the draft EA and discussed above, there is no evidence that the whale-finder sonars would cause injury or even result in temporary threshold shifts. Further, the draft EA acknowledges that the whale-finder sonar sounds are within the hearing range of toothed whales, but nothing more than short-term behavioral responses are likely from exposure. Even that is not probable given that the sounds of the whale finder sonar are similar to existing and ubiquitous fish-finder and depth sounders and because of the short duty cycle (10%) and brief duration of the experiment overall. Finally, it is not likely that

beaked whales or sperm whales would be present in the action area at the time of study. The issue of the impacts of “noise pollution” on these species is not within the scope of the draft EA. The scientific research permit process is not the appropriate mechanism for addressing the impacts of anthropogenic noise in the marine environment.

The WDCS states that the “argument [that sound levels the animals generate themselves would yield a tissue exposure greater than 180 dB re 1 μ Pa] is unsubstantiated and has been consistently refuted by experts in the field.

PR1 response: The statement that WDCS has quoted is not an argument. WDCS has misinterpreted the intent of the statement. Marine mammal vocalizations have, in fact, been recorded with a source level of over 180 dB. While there may be mechanisms in place to protect structures of the internal ear of the vocalizing animal from exposure to the full energy of the sound, there are no such protections for somatic tissues. In addition, whales can and do vocalize at this level in close proximity to conspecifics and there is no evidence of injury resulting from such exposures.

The WDCS state that “we do not know what energetic costs are associated with modification of [a cetacean’s] use of sound in order to compete with the whale-finder sonar system, as well as the original source of noise that the whale-finder sonar system is mitigating.”

PR1 response: The scope of the draft EA does not include the potential impacts of the use of the whale-finder sonars in conjunction with (*i.e.*, as mitigation for) other anthropogenic sounds. Without knowing which, where, how many, how often, etc. these activities would employ whale-finder sonars, NOAA Fisheries cannot speculate on how the whale-finder itself would or would not significantly contribute to the amount of noise resulting from these operations. Impacts of activities not covered by section 104 of the MMPA are beyond the scope of the scientific research permit process. The energetic costs of vocalization have been studied in some species but the issue is largely irrelevant to the proposed study. The brief duration of the individual sonar pings, combined with the brief duty cycle of the study make it unlikely that the proposed study would mask or otherwise interfere with cetacean vocalizations or otherwise require them to modify their calls or signals.

The WDCS has suggested that should testing of the whale finder sonar proceed in other geographic locations, “the relevant authorities in all these regions should be involved in the planning and coordination of such activities, including full and transparent consultation with the scientific and environmental communities.”

PR1 response: This comment is not relevant as the proposed action only involves a small and specific geographic area. However, NOAA Fisheries notes that any future studies proposed by Dr. Stein would be subject to the procedural and

substantive requirements of NEPA, MMPA and any other relevant statutes and regulations.

The WDCS states that they “are not aware of how these important biological concerns [stress, pain or suffering] might be monitored, as they may not be detectable through visual observations.”

PR1 response: There is no scientific evidence to suggest that the sounds from the whale-finder sonar would result in pain or suffering. Stress is also unlikely given the brief duty cycle and limited duration of the test. Thus, it is not clear why the study should involve attempts to monitor these factors, particularly since currently available means of directly measuring stress in marine mammals in real time involve intrusive procedures such as blood or tissue sampling. In the case of cetaceans, collection of blood would require capture and some sort of restraint, which can themselves result in stress, pain and suffering.

The WDCS states that they “are concerned that [the whale-finder sonars] may also increase ambient noise levels” and suggest that the “consequences of introducing considerably more noise into the marine environment should be considered.”

PR1 response: As explained in Footnote number 3 of the draft EA, the proposed study would not increase ambient noise in the study area as a whole. “Because of the logarithmic nature of decibel scales, the effect of the whale finder sonar on ambient noise levels would not be directly additive. That is, at most it would increase background noise levels by 3 dB. For example, if the ambient noise level at some distance from the sonar was 100 dB and the received level for the whale finder sonar was 100 dB, the total ambient noise level at the point would be 103 dB. When the difference between ambient levels and the sonar sounds are greater than 6 dB, their sum is within 1 dB of the higher of the two levels.” In the cumulative impacts section of the draft EA, NOAA Fisheries also notes that “Considering the brief period the proposed research will occur, the limited geographic scope (especially compared to the sizes of the ranges of the species that may be affected), the short acoustic transmissions that will be broadcast, the conservative maximum received levels set, the mitigation measures that will be employed, and that these sound sources are not novel to the marine environment, the proposed research will contribute a negligible increment over and above the effects of the baseline activities currently occurring in the marine environment where the proposed research would occur.” As discussed above, the potential impacts of the use of the whale-finder sonars in combination with (as mitigation for) other anthropogenic noises is not within the scope of the draft EA.

Mr. Sinkin submitted two sets of comments on the application and draft EA. In his first set of comments (dated November 28, 2003) he requested an extension of the public comment period and a public hearing. NOAA Fisheries evaluation of the information Mr. Sinkin submitted in support of this request is attached, as is our response to his

request. Mr. Sinkin's second set of comments, dated December 5, 2003, are summarized below.

Sinkin comments re: "Procedural Inadequacies and/or Violations"

Sinkin "Comment 1" (pages 2-4 of Sinkin comments dated 12/5/03) "The NMFS process improperly limited participation by the general public, individuals and organizations known to be concerned and a public agency previously having demonstrated interest."

Mr. Sinkin alleges that by withholding public notice of the application's receipt until preparation of a draft EA "NMFS has manipulated the process to minimize public scrutiny and participation," "NMFS put itself in a position where requests for extension of time in which to comment would be very difficult to accommodate," "NMFS has created a situation where opportunity for public and judicial review is limited."

PR1 Response: Mr. Sinkin's comments imply that NMFS somehow intentionally delayed making the application and draft EA available in order to prevent public comment. NMFS did not intentionally engage in any delays nor has the public been denied adequate opportunity to comment.

It takes time, usually many months, to research and prepare an EA. Given the limited staff available to process the large volume of permit applications received and associated environmental analyses, it took approximately five months to develop the draft EA prepared for Dr. Stein's proposed permit. This is not an extraordinary amount of time for preparing an EA. The fact that this put the close of the public comment period within weeks of the proposed start of Dr. Stein's research is purely coincidental. A review of previous applications and FR notices illustrates that it is not uncommon for comment periods to close near or even after the proposed start date of a research activity. This is simply a function of workload. While NOAA Fisheries makes every effort to accommodate proposed start dates of research activities that meet the issuance criteria of the MMPA and ESA, it has never intentionally structured the timing of a comment period to limit or otherwise hinder public participation or judicial review.

As with every permit application received, NOAA Fisheries held a 30-day comment period on Dr. Stein's application pursuant to Section 104 of the MMPA and 50 CFR 216.33. Mr. Sinkin has not demonstrated how this constitutes inadequate opportunity to comment. In fact Mr. Sinkin submitted 38 pages of comments on the application and draft EA by the close of the comment period.

Had NMFS received substantive comments warranting an extension of the public comment period or a public hearing, it would have done so, regardless of the proposed timing of the research.

Mr. Sinkin claims the California Coastal Commission (CCC) “demonstrated an interest in the earlier plan to test sonar on Gray Whales by requesting a briefing, which Dr. Tyack provided.”

PR1 Response: This is not correct. According to Mark Delaplaine, a representative of the CCC, the CCC did not request the briefing. In an email on December 11, 2003, Mr. Deleplaine stated that “Peter T. had volunteered the briefing we had last year. It was his idea. He appreciates the opportunity for public outreach that the CCC's process provides, and he knows the CCC members are very interested in acoustics/marine mammal issues. I intend to brief the Commissioners about the results of the research, once they are available, and Peter Stein has indicated that he would send me results and be supportive of our doing this.”

Mr. Sinkin asserts that the timing of the public comment period “made participation in the process by the CCC very difficult and forced the CCC to choose between no involvement or requesting full review, rather than having options of more limited involvement.”

PR1 Response: The CCC has not been denied an opportunity for involvement in review of the proposed research. The CCC chose not to request permission from NOAA’s Office of Ocean and Coastal Resource Management to review the application. Their decision not to request review was not a function of the timing of the Federal Register Notice. In addition, NOAA Fisheries was in communication with Mr. Delaplaine throughout the comment period. Mr. Delaplaine indicated that thus far the CCC has not chosen to exert jurisdiction over the type of activity proposed by Dr. Stein. According to Mr. Delaplaine: “To require a permit (under state law), we need to find that the research is ‘development’ as defined in our law. Noise is not development unless we establish that it would ‘change the intensity of use of water’ (among other sub-definitions). We have postulated that seismic surveys could be development, as they have shown to be loud enough to disperse fish and to cause damage to mammals or disruption in marine mammal behavior. It's not at all clear that this research would rise to that level of impact.” (Email, December 11, 2003)

Mr. Sinkin claims that “the very limited time frame available for public comment, the holding of a public hearing far from the individuals and organizations known to be concerned, and the very brief notice provided for even that one public meeting are all indicia of an agency determined to avoid a finding that the controversial nature of the proposal is insufficient to require an EIS.”

PR1 Response: As stated above, NMFS followed the provisions of the MMPA and its implementing regulations in holding a 30-day public comment period. Mr. Sinkin has not demonstrated how this was inadequate opportunity to comment. At the close of the comment period, NMFS had not been presented with compelling reason for an extension of this period or for holding a public hearing.

As the attorney representing the plaintiffs in prior litigation about whale-finder sonars, Mr. Sinkin was provided a copy of the application and draft EA at the start of the comment period. Mr. Sinkin's written comments state that they are on behalf of these individuals/groups.

Because of the prior litigation and records on file in support of the plaintiff's position, NMFS was already aware of the concerns of the individuals on whose behalf Mr. Sinkin says he has submitted his comments. The only other West Coast group to submit comments was the American Cetacean Society, whose comments and concerns were similar to those previously and currently expressed by Mr. Sinkin.

There are a number of non-profit organizations whose focus is the marine environment, animal welfare, etc. located on the East Coast, including the headquarters of The Ocean Conservancy, The Humane Society of the United States, World Wildlife Fund, the Fund for Animals, and the Animal Welfare Institute, all of which are located in the Washington, D.C. metro area. Representatives of the Fund for Animals and the Animal Welfare Institute attended the public meeting but did not submit comments on the application or draft EA either at the meeting or in writing. By holding the public meeting in the Washington, D.C. area, NMFS provided a forum for receiving comments from those groups and individuals who may not have been aware of the proposed research or previously commented on Dr. Tyack's research of a similar nature.

Sinkin "Comment 2" (pages 4-5 of Sinkin comments dated 12/5/03): "The failure to incorporate into the EA scoping process a discussion of the issues raised in the prior litigation and identified by the court as appropriately considered by such an EA violates APA/NEPA."

PR1 Response: The draft EA has addressed all the relevant issues raised by the court in its decision regarding Dr. Tyack's permit amendments. The court found that a violation of NEPA (invoking a categorical exclusion, in that case) is a harm to the environment. NOAA Fisheries has not proposed that issuance of a permit to Dr. Stein is categorically excluded from the need to prepare further environmental analyses. NOAA Fisheries has, in fact, prepared a draft EA and made it available for public comment. The court also found that there would likely be harm, in the form of pain and/or injury, from issuance of the permit amendment that increased the received level "of airgun sounds from 160 dB to 180 dB." (Line 9, Page 22) The court goes on to state that the concern for injury to gray whales involves an overlap in frequency in the assumed hearing range of gray whales and the whale-finder sonar and "evidence in the record that the total population of gray whales is...significantly below the population of gray whales...in 1984..." (Line 6, page 24) The study proposed by Dr. Stein does not involve playbacks of airgun sounds, which have very different acoustic properties

than the whale-finder sonars.² The draft EA does not analyze the effects of airgun sounds because they are not part of the proposed action. As has been stated in the draft EA and discussed above in response to various of Mr. Sinkin's comments, there is no credible scientific evidence that the whale-finder sonar sounds are likely to injure marine mammals or even result in temporary threshold shift. The draft EA presents information in support of NOAA Fisheries determination that (1) most if not all of the sound from the sonars would be inaudible to gray whales and (2) there is little if any overlap in the frequency of the whale-finder sonar and gray whale communication. Finally, as discussed in the draft EA and in response to "Comment 10" (the one that should have been numbered 11 in Sinkin's comments) below, there is no credible evidence that the gray whale population is crashing or otherwise in trouble at this time.

Mr. Sinkin states that "[i]n presenting a draft EA without a determination of whether there is significant impact and withholding the Biological Opinions, NMFS denies public comment on the ultimate determination and access to one of the key documents on which that determination will be made."

PR1 Response: First, NMFS has not withheld any Biological Opinions. As is clearly stated in the draft EA, and consistent with agency policy, NMFS does not conclude consultation under Section 7 of the ESA until the close of the comment period. The federal action under consultation is issuance of the permit, not receipt of an application. To ensure that any comments received can be considered in drafting the terms and conditions of the permit, and that such terms and conditions are part of the consultation process, it would be counterproductive to conclude consultation and prepare a BO in advance of the close of the comment period.

Second, Mr. Sinkin fails to demonstrate how having made the draft EA available for comment concurrent with the application has resulted in harm. If NMFS had published a Federal Register notice announcing receipt of an application and availability of a final EA and FONSI, the public would have had 30-days to comment on the adequacy of the analysis in the final EA. If no substantive comments were received to support a conclusion that a FONSI was inappropriate and an EIS was necessary, or that the activity proposed did not comply with permit issuance criteria, NMFS would issue the permit. At that point, anyone objecting to NMFS' decision on the permit or under NEPA could seek judicial review.

By making a draft EA available for comment concurrent with the application, NMFS intended to provide an opportunity for public input at an earlier stage in the NEPA process than is required by NMFS or CEQ regulations. Similar to the above scenario, if no substantive comments were received to support a conclusion that an EA was not the appropriate level of NEPA analysis, or that the activity

² For example, the duration (and thus exposure) of the airgun sounds is much greater than that of the whale-finder sonars; the frequency range is much lower so the propagation is different; and airgun arrays operate at substantially greater power output than the whale-finder sonars.

proposed did not comply with permit issuance criteria, NMFS would finalize the EA, prepare a FONSI, and issue the permit. At that point, anyone objecting to NMFS decision on the permit or under NEPA could seek judicial review, as Mr. Sinkin has previously done.

Sinkin “Comment 3” (pages 5-6 of Sinkin comments dated 12/5/03): “The incomplete NEPA analysis resulting from the draft nature off [sic] the EA and the withholding of the Biological Opinions violates APA/NEPA requirement to submit agency determinations for public comment.”

PR1 Response: Although technically a “draft” document, the EA was not incomplete. It contained all the sections required by CEQ regulations and provided an assessment of the potential environmental consequences of the proposed action.

Although the draft EA was not accompanied by a draft Finding of No Significant Impact, Section 4.8 of the draft EA “Consideration of Significant Criteria” clearly states NOAA Fisheries preliminary assessment of the context and intensity of the impacts. Clearly, these nine criteria would form the basis of a FONSI determination. In fact, on page 20 of his written comments, Mr. Sinkin himself acknowledges that “[w]hile the draft EA does not contain a final determination of significance, the specific elements discussed indicate that none of the elements resulted in finding significant impact.”

As stated in response to Comment 1 above, NMFS has not withheld any Biological Opinions.

Sinkin comments re: “Applicant Qualifications”

Sinkin “Comment 4” (page 6): “The application should be denied based on the Principal Investigator having an irreconcilable conflict of interest.”

PR1 Response: Mr. Sinkin asserts that “proving the effectiveness and safety of his equipment is important to [Scientific Solutions, Inc.]’s finances.” Whether or not Dr. Stein or his company have a financial interest in the proposed study is not relevant; the proposed study complies with the MMPA provisions for a permit and with issuance criteria in NOAA Fisheries implementing regulations, including meeting the *bona fide*³ standard. There is nothing in the MMPA or its implementing regulations that prohibits researchers or permit holders from experiencing financial gain as a result of their permitted activities. In fact, Dr. Stein would not be the first or only permit holder who might profit from a research activity related to development of a new technique or technology.

³ Under the MMPA, *bona fide scientific research* is defined as “scientific research on marine mammals conducted by qualified personnel, the results of which: (i) Likely would be accepted for publication in a refereed scientific journal; (ii) Are likely to contribute to the basic knowledge of marine mammal biology or ecology; or (iii) Are likely to identify, evaluate, or resolve conservation problems.” 50 CFR 216.3

Mr. Sinkin claims that Dr. Stein is attempting to “avoid the obvious conflict by saying that he will appoint a lead observer and give that person ‘ultimate control as to whether it is safe to conduct or continue the testing.’ Application at 21.”

PR1 Response: Mr. Sinkin has misinterpreted a statement in Dr. Stein’s application. The application states that “[a] lead observer will be appointed and will have ultimate control as to whether it is safe to conduct or continue the testing.” Having such an observer is a very conservative mitigation measure to ensure that the research is not having a significant adverse impact on marine mammals. It is also necessary to appoint an observer as Dr. Stein himself will be aboard the ship, potentially inside observing the sonar screens, and not on-shore where most of the observers are located. This sort of protocol, in which more than one person is involved because there are numerous roles to fill, is not uncommon in research studies. In accordance with NMFS regulations, Dr. Stein – as the Permit Holder and Principal Investigator – will maintain overall responsibility for the research activities.

Sinkin “Comment 5” (pages 6-7): “The application should be denied based on the Principal Investigator demonstrating a profound bias regarding the nature and potential impacts of his experiment.”

PR1 Response: Neither the MMPA nor NOAA Fisheries’ implementing regulations governing permit issuance require that a Principal Investigator be unbiased. NOAA Fisheries’ initial review of Dr. Stein’s application indicates that it complies with permit issuance criteria in the MMPA and NOAA Fisheries’ implementing regulations.

Sinkin “Comment 6” (page 8): “The application should be denied on the basis that the application demonstrates that the Principle Investigator lacks the necessary expertise to perform the marine mammal protection aspects of the proposal.”

PR1 Response: NOAA Fisheries review of Dr. Stein’s background finds that his qualifications are consistent with permit issuance criteria at 50 CFR §216.34. Specifically, his expertise, facilities, and resources are adequate to accomplish successfully the objectives and activities stated in the application. Given that the primary objective of the proposed study is to validate the ability of the whale-finder sonars to detect marine mammals, Dr. Stein’s background in engineering and marine acoustics makes him qualified to be the principal investigator for this study and oversee the technical aspects of the project. Dr. Stein’s co-investigators (CI), Dr. Christopher Clark and Dr. Adam Frankel, are equally well qualified to serve this role, which meets the regulatory definition of a CI. In addition, Dr. Frankel and Dr. Clark have years of experience observing and interpreting cetacean behavior.

Sinkin comments re: “The application and draft EA”

Sinkin “Comment 7” (pages 9-11): “The failure of the applicant to acknowledge the presence of a substantial number of newborn calves in the southward migration meant the application was incomplete and did not provide sufficient information to enable the preparation of an environmental assessment. The application should have been returned. When NMFS proceeded to process the application anyway and then either denied or inappropriately minimized the presence of baby Gray Whales in the action area, NMFS violated federal regulations and NEPA’s requirement to present the best available information to the public for comment.

PR1 Response: Whether or not the application acknowledges the potential presence of newborn gray whale calves in the action area is not sufficient reason for considering the application incomplete. Dr. Stein’s application contained sufficient information on the location, timing, duration and protocols of the proposed study to allow NOAA Fisheries to conduct the necessary environmental analyses under NEPA and ESA. Therefore, pursuant to 50 CFR §216.33, the application was complete.

The potential presence of newborn gray whales in the action area was not minimized in the draft EA. The draft EA notes that calves, including newborns, may be present, but that they are likely to be a small percentage of the total number of gray whales in the southbound migration and that the whale-finder sonars are not expected to result in injury or mortality of calves. The general discussion about the potential effects of the whale-finder sonars also indicates that not even temporary threshold shift is likely from the proposed study for any animal, including calves. The draft EA further notes that while gray whale calves may be able to detect the whale-finder sonars, the sounds are not likely to interfere with calf communication with their mothers.

Because the whale-finder sonars are not likely to harm gray whale calves or interfere with calf communication with their mothers, the actual number of calves present during the study is, in effect, irrelevant.

Sinkin “Comment 8” (pages 11-12): “The failure of the application to mention, let alone discuss, the presence of newborn calves in the action area means the application is incomplete and should be returned to the applicant. 50 CFR §216.33(c)(4).”

- “The failure of the applicant to provide a discussion of potential impacts of the proposed activity on newborn calves means that sufficient information was not provided to the Office Director to permit preparation of an informed environmental assessment. 50 CFR §216.33(c)(2)(B).”
- “The omission or minimization of newborn presence produced a failure on the part of NMFS to provide any meaningful discussion of potential environmental impacts to newborns.”
- “Absent the return of the application to the applicant, the Environmental Assessment should be supplemented with an additional assessment to address the

issue of potential sonar impacts on baby Gray Whales. That analysis should include the possible impacts on Gray Whales in the midst of the birthing process and their offspring.”

- “If the EA is supplemented with such an assessment, that assessment should be subject to a public comment period.”

PR1 Response: As discussed above in response to Comment 7, NOAA Fisheries determined that the application contained all the information requested in the application instructions, including sufficient information on the location, timing, duration and protocols of the proposed study to allow NOAA Fisheries to conduct the necessary environmental analyses under NEPA and ESA. Whether or not the application specifically discussed the potential presence of gray whale calves or the potential effects of the proposed study on calves did not prevent NOAA Fisheries from determining that some calves may be present during the southbound migration or from analyzing the potential impacts of the proposed action on calves.

Also as was discussed above in response to Comment 7, NOAA Fisheries did not omit or minimize the potential impacts of the proposed action on newborn gray whales. Our review and analysis of the best available information on propagation of sounds in the ocean and gray whale hearing indicates that any gray whale calves that may be present in the action area during the time of the study would experience, at most, short-term behavioral responses such as avoidance. Even this is unlikely considering the existing ambient noise levels in the action area and elsewhere in the migratory path, including numerous other high-frequency sonars in the form of fish finders and depth sounders. As the draft EA concludes, the whale-finder sonar sounds would represent an insignificant addition to the gray whale calves’ acoustic environment.

As discussed in the draft EA, there are a number of factors that support a conclusion that the whale-finder sonars would not interfere with calf communication calls with their mothers. First, the draft EA states that the duration of the sonar signal is less than a second. Although not specifically stated in the draft EA, this is shorter than the duration of marine mammal vocalizations so masking is not likely even if there were frequency overlap, which would be minimal at most in this study. Second, the draft EA states that adult gray whales, like other baleen whales, vocalize and are predicted to hear best at frequencies well below the frequency range of the whale-finder sonars. Although the draft EA does not contain an in depth explanation of “best frequency”⁴ and “hearing threshold”⁵ and the implications for hearing other frequencies, there is a glossary in an appendix of the draft EA that defines these and other acoustic terms. From those definitions, it should be clear that, as a sound deviates further and further

⁴ The best frequency is the frequency with the lowest hearing threshold for a particular species, that is, the best sensitivity.

⁵ The hearing threshold is the level of sound that is barely audible in the absence of significant ambient noise.

from an animal's "best frequency" it needs to be increasingly louder to be audible. The draft EA therefore correctly states that most if not all of the sound from the whale-finder sonars would be inaudible to gray whales. This would also apply to other high-frequency sounds at or near the predicted limits of hearing sensitivity of gray whales. It is therefore not logical to assume that gray whale calves would use high-frequency vocalizations at or above 20 kHz to communicate with their mothers. Thus, as was concluded in the draft EA, the whale-finder sonars would not interfere with mother-calf communication.

As a further note, Mr. Sinkin has incorrectly interpreted the scientific literature on gray whale calf vocalizations. There is no indication that they do in fact use frequencies at or above 20 kHz for their vocalizations. According to Dr. Tyack⁶, a recognized expert in the field of marine mammal acoustics:

[the reference] to clicks of gray whale calves having energy from 100 Hz to 20 kHz comes from Table 7.1 of Richardson et al (1995) Marine Mammals and Noise. One of the two refs for this entry (Fish et al 1974) summarizes data on gray whale sounds, emphasizing frequencies below 3 kHz. It then mentions recordings of clicks with peak energy well below 1 kHz, but with detectable energy up to 10 kHz. The other ref is Norris et al. (1977), a paper on the behavior of gray whales in southern Baja. Norris and co-workers put a noose around gray whale calves, pulled them onto the shore, and attached harnesses with radio tags, before releasing the calf to the waiting mother. While two of the calves were involuntarily stranded half out of the water, they made very intense broadband clicks. All broadband clicks have high frequency energy. The 20 kHz limit reported by Norris et al for the intense clicks of gray whale calves stems from the bandwidth of the recording system, not from the click itself: "a very intense broadband signal is portrayed, perhaps of frequency range extending well above the flat response band of our instrumental system (0.1-20 kHz)." The existence of high frequency energy in a broadband click is a consequence of the rapid rise of the click; in this case it may also be an artifact of overloading. The overwhelming predominance of energy in the click lies below 10 kHz and there no suggestion was made that the high frequency element of the signal was important for communication."

Dr. Tyack further states that "The sounds of gray whales on the migration have been extensively studied and no reports of sounds from migrating gray whales indicate energy at frequencies this high. All other reports document whale calls from several hundred to several thousand Hz."

Sinkin "Comment 9" (pages 12-13): "The applicant's failure to mention the presence of newborns in the southbound migration produced a concomitant failure to discuss potential interference in newborn communications with their mothers. This omission made the application incomplete. The application should have been returned. 50 CFR §216.33(c)(4)."

⁶ Dr. Peter Tyack, pers. comm., December 12, 2003

- “The NMFS discussion of the calf-mother communication omits calf vocalizations. Absent a decision to return the application, a supplemental Environmental Assessment should be prepared for this issue.”
- “If such a supplement is prepared, the supplement should be made available for public comment prior to a decision being reached on issuance of the permit.”

PR1 Response: As explained above in response to Comment 7-9, NOAA Fisheries determined that the application contained all the information requested in the application instructions, including sufficient information on the location, timing, duration and protocols of the proposed study to allow NOAA Fisheries to conduct the necessary environmental analyses under NEPA and ESA. Whether or not the application specifically discussed the potential presence of newborn gray whale calves or the potential effects of the proposed study on newborn calves did not prevent NOAA Fisheries from determining that some calves may be present during the southbound migration or from analyzing the potential impacts of the proposed action.

Also as discussed above in response to Comment 8, there is no scientifically credible information to suggest that the whale-finder sonars would interfere with communication between gray whale calves and their mothers.

Sinkin “Comment 10” (Pages 13-15): “The failure of the applicant to acknowledge the presence of newborns in the southbound migration and the resulting failure to discuss the potential impact resulting from broadcasts within the hearing range of the newborns means that the application is incomplete and should be returned. 50 CFR §216.33(c)(4).”

- “The minimal discussion in the EA of potential impact on mother-calf relationships omits and discussion of differential responses by the mothers and calves to the broadcasts. This issue should be discussed in a supplemental environmental assessment.”
- “If a supplemental environmental assessment is prepared, that supplement should be made available for public comment prior to a decision being reached on issuance of the permit.”

PR1 Response: As explained above in response to Comment 7-9, NOAA Fisheries determined that the application contained all the information requested in the application instructions, including sufficient information on the location, timing, duration and protocols of the proposed study to allow NOAA Fisheries to conduct the necessary environmental analyses under NEPA and ESA. Whether or not the application specifically discussed the potential presence of newborn gray whale calves or the potential effects of the proposed study on such calves did not prevent NOAA Fisheries from determining that some calves may be present during the southbound migration or from analyzing the potential impacts of the proposed action.

The draft EA does not discuss “differential responses by the mothers and calves to the broadcasts” because there is no scientifically credible information to suggest

that calves are any more or less likely to be affected by the whale-finder sonars than their mothers.

Sinkin “Comment 11” (page 16): “The safeguards in the application are inadequate to ensure protection of newborn Gray Whales. The reliance on shore and ship observers to detect responses is arbitrary.”

PR1 Response: Given that the best available information indicates that neither physical injury nor even temporary hearing threshold shift is likely from the proposed study, and that the whale-finder sonars are not likely to interfere with mother-calf communication for the reasons discussed above in response to Comments 7 and 8, there is no reason to believe newborn calves will be affected. Nevertheless, out of an abundance of caution, both Dr. Stein and NOAA Fisheries have proposed mitigation measures to ensure that exposure to the whale-finder sonars will not result in significant adverse impacts on the environment.

As to Mr. Sinkin’s comments on observers, Mr. Sinkin has incorrectly interpreted the role of observers. The observers will be focused on tracking marine mammals. Although no behavioral responses are anticipated because most if not all of the whale-finder sonar sounds will be inaudible to gray whales, a secondary role of the observers will be observing any behavioral changes during the study. There will be different personnel on the research vessel whose role is to monitor the sonar screen for echoes. Thus, the observers would not be “dual-tasked” as Mr. Sinkin has implied. It is not clear why Mr. Sinkin finds the use of both shore and ship based observers arbitrary since he has not suggested an alternative means of detecting marine mammals in the action area. In addition, as was discussed in the application and draft EA, the IMAPS system also involves the use of passive acoustics to detect marine mammals. Further, while previous surveys (conducted for NOAA Fisheries stock assessments) have suggested that a high percentage of calves compared to adults may not be detected by observers, adult animals are visible, particularly within the 100 m that would be used as the distance from the research vessel at which the sonar would be shut down. Given that the whale-finder sonars are not likely to be audible to gray whales, and that newborn calves would be accompanied by adults (unless abandoned, in which case they would not survive long regardless of the study), it is not clear why it matters whether or not observers can see newborn calves during the proposed study.

NOTE: From this point forward, there was an error in Mr. Sinkin’s numbering of his comments. NOAA Fisheries has preserved the original order and numbering scheme should anyone need to compare our responses directly with Mr. Sinkin’s actual letter.

Sinkin “Comment 10 [sic]” (page 16-19): “The application should be returned or denied based on the failure to consider the population crash that took place in the 1998-2002

period and possible implications of that crash as a context for any interference in the migration.”

- “Alternatively, the EA should be supplemented with an additional assessment to address the issue of potential impacts of the experiment in the context of a recent population crash.”
- “If the EA is supplemented with such an assessment, that assessment should be subject to a public comment period.”

PR1 Response: Mr. Sinkin’s suggestion that the application be returned because Dr. Stein’s application did not acknowledge Mr. Sinkin’s unsubstantiated position on the gray whale population status is not convincing.

First, the gray whale population has not crashed, as Mr. Sinkin suggests. Mr. Sinkin has mischaracterized the unusual mortality event (UME) that occurred during 1999 and 2000, and was resolved by 2001, as a “significant drop in Gray Whale population in the 1998-2002 period.” There were a higher than average number of stranded gray whales sighted in 1999 and 2000 along the west coast of North America (273 in ’99 and 355 in ’00 compared to an average of 38 in previous years). However, analysis of stranding data suggest this was an UME that ended by 2001. Only 21 gray whale strandings were reported in 2001, which is close to the average of 38 per year for the period of 1995-1998. During the 1999 and 2000 UME, whales were visibly thin. Whales observed during surveys since 2001 have been visibly rotund. In addition, the number of stranded animals has been lower than average since 2001 and calf counts have been high. As was discussed in the draft EA, this UME is believed to be linked to a temporary food shortage resulting from a climatic event. A UME is an acute event, rather than a chronic trend and is not a “population crash” as Mr. Sinkin has called it.

Second, there have only been three surveys during the southbound migration between 1997 and 2002. The abundance in 1997/98 was the highest since surveys in 1967. The abundance estimates were 29, 758 whales in 1997/98, 18,784 (95% C.I. = 15, 566 to 22, 667) in 2000/01 and 17, 614 (95% C.I. = 14, 557 to 21, 314) in 2001/2002. There is some overlap in the 95 % confidence intervals for the last two surveys. The lower estimates in 2000/01 and 2001/02 are probably related to the UME in 1999/2000. It would be inappropriate to define a population trajectory based on three point estimates over five years for a long-lived, slow to mature species such as gray whales.

Looking at the abundance surveys from 1967 to date, it appears this gray whale population is at or approaching the carrying capacity of its environment. If this is the case, it can be expected that subsequent surveys will show a trend toward a stable rather than increasing population abundance. This does not necessarily mean that counts will be the same each year. It would be expected for abundance surveys of a population at or near carrying capacity to show deviations both above and below an average value over time due to natural stochastic population factors as well as variations in survey methods, statistical inferences, etc. In addition,

depending on food and weather conditions, there may be years when many whales simply do not migrate as far south as they had in previous years. Depending on where the survey is conducted, these whales could be missed and go uncounted entirely. It is possible that in 2000/01 and 2001/02, a significant portion of the population did not migrate as far south as the census point. Unexpectedly low abundance estimates occurred in 1970/71, 1971/72, 1978/79 and 1992/93. However, in all but the first case, they were followed in subsequent seasons by much higher estimates.⁷ It is possible this was the case with the 2000/01 and 2001/02 surveys. It remains to be seen whether the point estimates from these years represent a slowing of the population growth or a stabilization at carrying capacity. However, based on the observed higher calf counts, lower strandings numbers and overall good physical appearance of whales during the southbound migration, there is no indication that the gray whale population is in decline.

Finally, regardless of the absolute number of gray whales, or the ultimate population trajectory, all credible scientific information indicates that there will be no significant adverse impacts on gray whales or any other marine species from the proposed action.

Sinkin “Comment 11 [sic]” (pages 19-20): “The application should be returned or denied based on the applicant’s failure to consider the implications of the precipitous decline in the Gray Whales population in the 1998-2002 period.”

- Alternatively, the Environmental Assessment should be supplemented with an additional assessment to address the issue of potential impacts of the experiment in the context of the implications to be drawn from the recent population crash.”
- “If the EA is supplemented with such an assessment, that assessment should be subject to a public comment period.”

PR1 Response: This comment is virtually the same as Comment 10 above (the one that should be numbered Comment 12). See response above.

Sinkin “Comment 12 [sic]” (page 20): “A final decision on the application should be deferred until NMFS follows the direction of the court and considers the issues identified by the court. Because following that direction would require supplementing the EA with additional analysis, the additional analysis should be subject to a public comment period.”

PR1 Response: This comment is virtually the same as a previous statement made under the heading of “Comment 2.” See response above.

Sinkin “Comment 13 [sic]” (pages 20-22): “The inappropriate omission of key issues during the scoping process lead to an inadequate analysis of environmental impacts and unreliable assessments of significance.”

⁷ Rugh et al. In Press. Estimates of abundance of the eastern North Pacific stock of gray whales 1997 to 2002. *J. Cetacean Res. Manage.* 1(1): 3-24.

PR1 Response: Mr. Sinkin appears to once again be referring to the issues of calves being present during the migration and the UME of 1999 and 2000. Mr. Sinkin poses what he finds are the relevant NEPA questions in the context of the presence of newborn gray whales and their communications with their mothers and the population abundance issue and then asserts that these issues make the proposed action “highly controversial.” These issues were addressed in the draft EA and, as discussed above, the best available information indicates that significant impacts are not likely from the proposed action. There is no scientific controversy surrounding the lack of potential for significant impacts on the environment. The public controversy does not rise to a level at which preparation of an EIS is warranted.

Sinkin “Comment 14 [sic]” (page 22):

NOTE: Unlike the other comments in his letter, Mr. Sinkin did not set aside a summary remark in bold for this section, entitled “Unintentional takes.” It is not clear what the intent of this section is, but NOAA Fisheries has assumed that, in keeping with the general structure of this letter, the final sentences represent his summary.

“The fact that the applicant selected the Gray Whales as the target species would seem to be irrelevant to the analysis of impacts on the non-target species. Whether an impact is intentional or unintentional, analysis of the impact is required by law.

PR1 Response: Mr. Sinkin is correct that an EA must assess both intentional and unintentional impact of a proposed action. As discussed in chapter 3 of the draft EA, the only marine mammal species likely to be present in the action area and able to hear the high-frequency whale-finder sonars are sea otters, pinnipeds, and toothed whales. The potential effects of exposure to these sounds on these species are discussed in the draft EA. Therefore, it is not clear to what Mr. Sinkin is objecting.

Sinkin “Comment 15 [sic]” (pages 22-23) “ESA Impacts”

NOTE: Unlike the other comments in his letter, Mr. Sinkin did not set aside a summary remark in bold for this section, entitled “ESA Impacts.” After review of the entire text, it would appear that Mr. Sinkin’s primary issue in this section is sea otters, although he also briefly mentions attenuation of the signal.

“The generic discussion of attenuation, EA at 16-17 does not provide sufficient information to determine the actual attenuation in the action area. The presence of sound ducts and other factors will limit attenuation.”

PR1 Response: The discussion in the draft EA is not generic. The draft EA refers to information provided in the application and by the applicant, an expert in acoustics, for determining the probable sound propagation. The discussion in the

application and draft EA specifically explains how the factors that influence propagation of high-frequency sounds were considered in modeling the size of the action area. In response to Mr. Sinkin's comment, Dr. Stein has conducted a second simulation of sound propagation that confirms the initial modeling results.⁸ Both simulations relied upon information about the actual seasonal and physical characteristics of the specific action area. Both models are also conservative in that they assume better sound propagation than is likely. Thus, the theoretical size of the action area is probably larger than the effective zone of audibility. The presence of sound ducts is highly unlikely in that location at that time of year.

“The minimal discussion related to sea otter impacts does not provide the level of information a Biological Opinion would provide.”

PR1 Response: The draft EA fully discusses the potential effects of the proposed study on southern sea otters. As discussed above in response to Comment 2, NOAA Fisheries does not conclude consultation under section 7 of the ESA until the close of the public comment period. As part of the consultation process, NOAA Fisheries provided a copy of the application and draft EA to the U.S. FWS, which has concurred with our determination that issuance of the permit is not likely to adversely affect southern sea otters.⁹

Mr. Sinkin's "Additional Comments" (pages 23-25)

“While the applicant's failure to specify a time period is a minor omission, this omission forms part of a pattern of failing to provide adequate information that supports a decision to return the application as incomplete.”

PR1 Response: Dr. Stein did not omit the time period for his research. On the contrary, Dr. Stein very clearly indicated that his proposed study would occur between mid-December 2003 and mid-February 2004 during the peak of the gray whales' southbound migration. Although the application mentions that future tests may take place in other locations and other times of year, the draft EA very clearly defined the proposed action as issuance of a five-year permit to conduct the study offshore of central California between December and February of each year that the permit is valid. Should Dr. Stein choose to conduct his study at other locations within U.S. or international waters, or at other times of year, he will have to request an amendment, which would be subject to the same issuance criteria, including review under NEPA, as the original application.

“Given the existence of sonars capable of detecting whales, there is no clear need for the research proposed.”

⁸ The results of this simulation, and an explanation of the results, are attached.

⁹ A copy of the response from USFWS is part of the administrative record for Dr. Stein's permit application.

PR1 Response: There are no sonars other than the HF/M3 used with the SURTASS LFA that can reliably detect whales. The draft EA states that the whale-finder sonars are analogous to fish-finders and depth-sounders in frequency and power. It does not state that they are the same thing. The HF/M3 is not a practical option for the uses that the IMAPS whale-finder sonar is intended. As was clearly stated in both the application and draft EA, there is a real conservation need for sonars that can reliably detect marine mammals without harming them. Potential applications of the whale-finder sonar include minimizing the potential for injury of marine mammals during seismic exploration and underwater explosions.

Contrary to Mr. Sinkin's opinion, this proposed study meets the regulatory definition of *bona fide*. As stated in the draft EA, the development of this technology is likely to help resolve marine mammal conservation problems for the reasons summarized in the paragraph above. Although not stated in the draft EA, the results of this study are likely to be accepted for publication in any number of refereed scientific journals, which is another criteria for *bona fide*. A review of Dr. Stein's, Dr. Clark's or Dr. Frankel's publication list will show that this type of study is precisely the sort of thing accepted for publication in refereed scientific journals such as Sea Technology, Reports of the International Whaling Commission, Journal of Ocean Engineering, Journal of the Acoustic Society of America, etc.

“Given the conflict of interest, bias, and lack of qualifications of the Principle Investigator, there is some question whether the results of the sonar tests would have the credibility to resolve anything.”

PR1 Response: As has been discussed above, the Principle Investigator is qualified to hold a permit pursuant to section 104 of the MMPA and according to the criteria in NOAA Fisheries implementing regulations. The issues of bias and conflict of interest have also been discussed above. There is nothing about Dr. Stein's application or qualifications to call his credibility or ability to conduct the study into question. In science, nothing is certain and whether or not the results of the study ultimately satisfy the objectives of the proposed research is part of the trial and error of the scientific method. If a study does not provide the anticipated results, it is common practice to re-evaluate the study design and conduct another study. However, all the available information about the experience and expertise of Dr. Stein and his co-investigators, as well as data on acoustics indicates this study has a high probability of success and a negligible probability of adverse impacts.

“If...there is some characteristic of the so called whale-finder sonar that is unique when compared to fish finders...[t]hat characteristic may be precisely what causes the whale-finder sonar to have an environmental impact that would not be caused by the fish finders.”

PR1 Response: Mr. Sinkin has misunderstood or misinterpreted the draft EA. The draft EA states that the whale-finder sonars being tested by Dr. Stein are similar in frequency and output power to fish-finders, depth sounders, and side scan sonars. This means that the frequency of operation and the acoustic output power is similar. The MAST mechanical system operates between 30 and 40 kHz and has a maximum instantaneous output power around 1 kilowatt. The IMAPS system operates between 20 and 30 kHz and has a maximum power output of 3 kilowatts. As an example, Furuno/Raytheon (www.furuno.com) sells fish-finders that operate between 28 kHz and 235 kHz with a maximum instantaneous output power up to 3 kilowatts. There are many such fish-finders, depth sounders, and side scan sonars that operate between 3 kHz and 250 kHz with similar acoustic output powers.

The main difference between these commercially available devices and the "whale-finder" sonars is sophistication, not the loudness or potential for adverse effects of the sonar. The goal of the proposed study is to develop systems that detect whales out to 1 mile, which is well beyond the range of commercially available fish-finders. Also, fish-finders do not look in all directions, while the whale-finder systems are designed to look all around. The whale-finders being developed must also have a very high chance of detecting and identifying a marine mammal while also having a very low chance of mistaking another object for a marine mammal. If a fish-finder does not detect a single fish or mistakes some other object for a fish, there's no real harm. However, since the purpose of the whale-finder is to protect marine mammals from potentially harmful activities, one would not want to miss a single marine mammal. Conversely, it would not be acceptable to be constantly stopping an operation when an object that may not be a marine mammal is detected.

Another difference between the whale-finder and fish-finders is that the whale-finders are deployed well below the hull of the ship (as deep as 200 ft), while fish-finders are attached to the hull of the ship. In most cases, having the fish-finder attached to the ship's hull would prevent seeing any objects out to 1 mile. .

The whale-finder sonars that are part of the proposed action are also different from the HF/M3 in a number of ways. Both the Mast Mechanical System (a version of the HF/M3 system that is installed with SURTASS LFA) and the IMAPS system work by forming beams that look out in all directions. The manner in which they form beams is different such that the HF/M3 works fine in deep water and for its particular application, but is not expected to work well in shallow water. The HF/M3 system is used in areas where there will be very few other objects. The IMAPS system is meant to be used in areas where there are many other objects. It will reject these other objects through very complex signal processing that detects, classifies, and tracks the whales. But in order to fully develop IMAPS one needs to know what a whale "looks like" to the sonar, and in much more detail than has ever been collected. That is one of the main purposes of the proposed testing.

Other Applicable Regulations

Oceans Act of 1992: Research will not occur in or near a National Marine Sanctuary.

ESA Section 7 Consultation: NOAA Fisheries Permits, Conservation and Education Division (Permits Division) consulted with the U.S. Fish and Wildlife Service regarding its determination that issuance of the permit was not likely to adversely affect southern sea otters. The Permits Division also consulted with NOAA Fisheries Endangered Species Division on its determination that issuance of the permit was not likely to affect endangered blue, fin, sei, humpback, or sperm whales or threatened Guadalupe fur seals or Steller sea lions. Both the USFWS and the Endangered Species Division concurred with the Permits Division's determination. The consultations concluded that, based on the available information, the issuance of this Permit is not likely to adversely affect the continued existence of the threatened or endangered species or result in the destruction or adverse modification of designated critical habitat. A record of these consultations is part of the administrative record for File No. 1048-1717.

National Environmental Policy Act: Scientific research and enhancement permits are, in general, categorically excluded from the requirement to prepare an Environmental Assessment or Environmental Impact Statement (NOAA Administrative Order Series 216-6, May 20, 1999) since, as a class, they do not have a significant effect on the human environment.

In reviewing the permit request, NOAA Fisheries determined that public health and safety are not affected; no unique geographic area is affected; and the effects of this research are not highly uncertain, nor do they involve unique or unknown risks. Issuance of this permit will not set a precedent for future actions with significant effects, nor does it represent a decision in principle about a future consideration. There are no individually insignificant but cumulatively significant impacts associated with the proposed action, and there is no adverse effect on historic resources. No endangered or threatened species or their habitat are adversely affected. The Permit contains mitigating measures to minimize cumulative effects and to avoid unnecessary stress to the subject animals by halting research activities should the animals exhibit signs of stress, pain, or suffering. Given these findings, NOAA Fisheries could have issued the permit without preparation of further environmental analyses.

However, NOAA Fisheries previously categorically excluded issuance of a scientific research permit for a similar study. The permit was permanently enjoined by a Federal court prior to initiation of any research activities because the court found that NOAA Fisheries incorrectly invoked a categorical exclusion in issuing the permit (*Hawaii County Green Party vs. Evans*, C-03-0078-SC, U.S. District Court, Northern District of California). Therefore, NOAA Fisheries prepared a draft Environmental Assessment (EA) to examine whether significant environmental impacts could result from issuance of the proposed scientific research permit or any of the alternatives identified as reasonable.

The draft EA was made available to the public for review and comment concurrent with the application.

During the comment period, written comments were submitted on the draft EA and application, as summarized above (see also attached). As discussed above, none of the commenters presented any compelling evidence in support of the probability of significant adverse environmental impacts resulting from the study. Thus, for the reasons discussed in the draft EA, NOAA Fisheries determined that issuance of the permit, as identified in the Proposed Action and pursuant to the Marine Mammal Protection Act of 1972, as amended (MMPA; 16 U.S.C. 1361 *et seq.*), would not significantly affect the quality of the human environment. Therefore, preparation of an EIS on this action is not required by section 102(2) of the National Environmental Policy Act or its implementing regulations. NOAA Fisheries finalized the EA and a Finding of No Significant Impact was signed on December 23, 2003.

Recommendation

The research is consistent with the purposes and policies of the MMPA. It is believed that the research will further a *bona fide* scientific purpose and does not involve unnecessary duplication. No adverse impacts to the populations or to the ecosystem as a result of the authorized activities are anticipated. For these reasons, I recommend that you sign the Permit.

cc: Sloan

Attachment 1: Public comments on application and draft EA

Attachment 2: Dr. Stein's response re: PROPAGATION QUESTION

The EA used a propagation model that assumes spherical spreading plus absorption. This will be accurate both close to the source, within the first several hundred meters, and far from the source when absorption takes over. The EA uses this model to define an action area based on the attenuation at long range and to determine the range beyond which the level is guaranteed to be less than 180 dB re 1 μ Pa (100 m). This model is adequate to accurately determine these two parameters for this case. Granted, the levels will be different than actually observed between these limits. But the sound will never be louder than 180 dB re 1 μ Pa beyond 100 m. And since attenuation due to bottom loss and surface scattering was ignored in the model used, the overall long-range attenuation, and the action area estimate is very conservative. Note there are no sound ducts at this time of year (sound ducts rely on warming of the surface layer that generally does not occur off the central California coast at all because of the up-welling).

This is evident by the four figures shown below. They display the transmission loss at 20 kHz as a function of range using an advanced acoustic propagation model that uses the sound speed profile specific for the central California coast in winter. The location of the source and its depth is that planned for this January. Bottom scattering is now included. Shown are plots for along slope, up-slope, and down-slope. The transmission loss required for levels to be less than 180 dB re 1 μ Pa is 40 dB. The transmission loss is always greater than 40 dB beyond 100 m. The transmission loss at the far ranges is generally much greater than that assumed in the EA. The transmission loss at frequencies greater than 20 kHz was also calculated and is in general higher.

