

Testimony of Peter Tyack, Biology Department, Woods Hole Oceanographic Institution

To the Subcommittee on Ocean, Fisheries, and Coast Guard of the Senate Committee on Commerce, Science and Transportation

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Madame Chair and distinguished members of the Committee, my name is Peter L. Tyack. I am a Senior Scientist and Walter A. and Hope Noyes Smith Chair in the Biology Department of the Woods Hole Oceanographic Institution in Woods Hole, Massachusetts. Thank you for the opportunity to provide my views on reauthorization of the Marine Mammal Protection Act (MMPA).

I have been fascinated since I was a child with the social behavior of marine mammals and how they use sound to communicate and explore their environment. I have spent much of the last 25 years following these animals at sea, listening to their sounds and watching their behavior. As I started my career in basic research it never occurred to me that chasing my personal interests would ever become central to such an important policy issue. In my testimony I address issues concerning regulation of harassment takes under the MMPA, especially those for scientific research and incidental takes resulting from exposure to manmade noise.

Introduction

Three committees of the National Research Council (NRC) of the National Academy of Sciences have reviewed issues concerning low frequency sound and marine mammals. Each of these NRC committees has published a report:

National Research Council (NRC). 1994. *Low-Frequency Sound and Marine Mammals: Current Knowledge and Research Needs*. National Academy Press, Washington, D.C.

National Research Council (NRC). 2000. *Marine Mammals and Low-Frequency Sound: Progress Since 1994*. National Academy Press, Washington, D.C.

National Research Council (NRC). 2003. *Ocean Noise and Marine Mammals*. National Academy Press, Washington, D.C.

I was a member of the first two committees and reviewed for the NRC the report produced by the third committee. I would like to take this opportunity not only to give my personal views, but also to reiterate some of the repeated suggestions of the NRC committees for changes to the MMPA.

Regulations to protect marine mammals need to be drawn to focus scarce regulatory resources on situations where “takes” are most likely to risk adverse impacts to marine mammals.

One of the most important suggestions of the NRC reports on marine mammals and ocean noise is to regulate harassment in the same way for all activities, allocating regulatory effort where harassment takes are most likely to risk adverse impacts to marine mammals. Currently we are far from this goal. For commercial fisheries, section 118 of the MMPA allows incidental taking of marine mammals as long as there is negligible impact from incidental mortality and serious injury. NMFS interprets this as an exemption for commercial fisheries from the prohibition of harassment. Harassment takes are also ignored for effects of propulsion noise from vessels, which accounts for more than 90% of the acoustic energy humans put into the sea. Many other users of sound in the sea, from the Navy to geophysical contractors to academic oceanographers, find themselves in a no-man’s land, where the appropriate regulatory process for incidental harassment takes is obscure. So far the solutions of the regulatory agencies have fared poorly in court.

Congress speaks through the MMPA to give commercial fisheries a special exemption with much more scope to harass marine mammals than other activities such as conservation research, naval exercises, or oil exploration. This is in effect a statement of national priorities, ranking activities for which the United States is most willing to risk the well being of marine mammals. I would ask all members of this Committee to stop and think whether commercial fishing should automatically rank as a higher national priority than scientific research, the search for domestic sources of petroleum, or the ability to protect our nation from enemy submarines.

During the past several years, there have been efforts to address the very real problems with the MMPA by developing new exemptions for specific activities such as military readiness. I do not think that complicating the Act by creating yet another special exemption is the best answer. I strongly urge Congress to respond to the problems highlighted by DOD by trying to fix the underlying flaws in the regulatory procedures of the MMPA before granting a special exemption that does nothing for marine mammal conservation and leaves many other producers of sound in the sea with no way to meet the regulatory requirements. If done correctly, the regulations might be able to include all activities in a streamlined regulatory approach that focuses attention on those situations that pose the most risk to marine mammal populations.

The dirty secret of the MMPA is that the prohibition on unintentional takes is ignored more often than it is regulated and enforced. For example, ships regularly collide with marine mammals and often kill them. So many highly endangered right whales are killed by vessel collision, that population models predict this additional mortality may drive the species to extinction. While fisheries are regulated for lethal takes under section 118 of the MMPA, no other activity is included in these regulations. If a fishing vessel casts nets that may entangle and kill marine mammals, the vessel is regulated. If the fishery takes enough marine mammals to threaten a population, the fishery may be shut down. Every

time a ship speeds through right whale habitat, there is a low but real chance the ship may strike and kill a whale, speeding the species to extinction. Yet there is no regulation of this risk, nor to my knowledge has any ship been prosecuted for striking a whale and killing it.

Regulation and enforcement of harassment takes is even worse than lethal takes. The senior enforcement attorney for one of the NMFS regions reported to the Marine Mammal Commission last year that his region will not prosecute cases of level B harassment for companies that take tourists to swim with wild dolphins. This growing industry based upon intentional harassment thus can count on freedom from prosecution of its violations of the MMPA, and indeed can openly advertise their business based upon illegal taking. On the other hand, marine mammal biologists are required to wait half a year or more for permits covering the slightest possibility that their research may disrupt the behavior of marine mammals. Once they receive a permit, the permitting process itself may trigger litigation that can block urgently needed conservation research.

The National Academy (2000) report on Marine Mammals and Low-frequency Noise disagreed with the strategy of special exemptions for specific activities that cannot operate under the current restrictions of the MMPA, but rather argued for creating a comprehensive regulatory structure for all activities that might take marine mammals.

The Committee also suggests that activities that are currently unregulated, but which are major sources of sound in the ocean (e.g. commercial shipping) be brought into the regulatory framework of the MMPA. Such a change should increase protection of marine mammals by providing a comprehensive regulatory regime for acoustic impacts on marine mammals, eliminating what amounts to an exemption on regulation of commercial sound producers and the current and historic focus on marine mammal science, oceanography and Navy activities. (p. 72)

This change would be all the more effective if it was not limited to acoustic impacts, but included all sources of takes including harassment into an integrated workable regulatory structure.

I urge the Commerce Committee to resist adding special exemptions to the MMPA for specific activities, but instead to consider modifications that require all potential takes to be accounted for. These modifications should separate activities into those with remote likelihood, moderate, or high probability for incidental takes with a potential for adverse impacts to populations of marine mammals. This broadening of regulation would require a streamlined authorization procedure, with simple general authorizations for activities thought to have negligible impact, and more careful regulation of activities that threaten populations of marine mammals. Given the history of regulation under the MMPA, Congress may have to require the regulatory agencies to direct regulation and enforcement to those activities posing the highest risk, and to streamline regulation of those activities that pose lower risks.

Problems with permitting scientific research on marine mammals.

As a biologist personally concerned with protecting marine life, I believe that double standards in the MMPA have led to a particularly counterproductive situation for permitting scientific research designed to protect marine mammals. The permitting process was created to allow an exemption for scientific research from the MMPA prohibition on taking marine mammals. It is ironic that, far from exempting research from an effective prohibition, the permitting process restricts for researchers, activities that are unregulated for other users. For example, a scientist playing back the sounds of a tanker to monitor responses of whales requires a permit to cover any “takes” for animals whose behavior has changed, while the thousands of tankers entering US ports are unregulated. This is particularly ironic since the first warning about effects of noise on marine mammals concerned the risk that increased shipping noise might significantly reduce the range over which whales could communicate, a warning issued in 1972, the year the MMPA was enacted. Not only can the shipping industry ignore the likely disruption of behavior caused by noise, but even the lethal “impacts” caused when a vessel collides with a whale are completely unregulated. Nothing we have learned in the following decades has reduced scientific concern, yet in spite of three decades of warnings, NMFS has only just started to take the first steps to protect whales from the risks posed by vessel traffic.

As early as 1985, NMFS stated in its Annual Report on the MMPA that “one of the most extensive administrative programs in NMFS is the permit system that authorizes the taking of marine mammals for scientific research and public display.” I understand that today the NMFS Permit Office has 7 personnel devoted to research permits, but only two devoted to all other authorizations for incidental taking. From my perspective, this is backwards. Scarce regulatory resources should only be devoted to minor harassment takes for research after the much more significant takes of activities that do not benefit marine mammals are controlled by regulations that are effectively enforced.

It has been recognized for over a decade that the regulatory focus on research activities is interfering with research needed to obtain critical information to evaluate risk factors for noise exposure in the sea. As the 1994 National Academy report on Low-frequency Sound and Marine Mammals put it:

Scientists who propose to conduct research directed toward marine mammals are aware of the permitting requirements of the MMPA and of the Endangered Species Act (ESA) and the associated regulations. Most of their research can be conducted under the scientific permitting process. They routinely apply for and obtain such scientific research permits. However, the lengthy and unpredictable duration of this process can create serious difficulties for research.... In addition to permit delays, certain types of research that are considered “invasive” or “controversial” either are not allowed under the current permitting process or may require an Environmental Assessment or even an Environmental Impact Statement under the National Environmental Protection Act (NEPA). Such a regulatory burden actively discourages researchers from pursuing those lines of study. (p 29)

The committee strongly agrees with the objective of marine mammal conservation, but it believes that the present emphasis on regulation of research is unnecessarily restrictive. Not only is research hampered, but the process of training and employing scientists with suitable skills is impeded when research projects cannot go forward. Experienced researchers are the ultimate source for expanding our knowledge of marine mammals. A policy that interferes with the development of this resource appears to be self-defeating. (p 30)

Things were bad in 1994, but they have recently become much worse. The delays for permitting have become much longer, over 21 months in some cases. In addition, the judge in a recent court case regarding the permitting process ruled that all acoustic research on marine mammals is controversial. This led him to rule that a permit for acoustic research requires an accompanying Environmental Assessment or Environmental Impact Statement. This decision means that all of the research that can help resolve the marine mammal issues raised by the National Academy reports is subject to much more regulatory burden than before. Unless Congress changes the regulatory process or provides new funds to the NMFS Office of Protected Resources to conduct the analyses required under NEPA, the permitting process will not only discourage research, but may make it almost impossible to conduct some research that has negligible effects and is urgently needed for conservation biology.

Let me illustrate with an example from the research of Scott Kraus, a biologist at the New England Aquarium who has studied North Atlantic right whales for decades under a series of research permits from NMFS. In August of 2001, he applied for a new permit, as his old one was set to expire 31 December 2001. In November 2001, after the end of the public comment period, the Permit Division received a letter from a self-styled "environmental warrior" claiming, incorrectly in my belief, that the research would harm right whales. In early December 2001, operating under his old permit, Kraus started aerial surveys to keep ships from hitting whales, and he was told the biological opinion for the new permit was almost done. Kraus never received his permit by the time his old one expired, and on 24 January 2002, NMFS informed him that they would defer decisions on a permit until an Environmental Assessment was conducted following NEPA rules. This was a complete surprise for Kraus, who had to cancel a research program designed to develop whale-safe lines for fishing gear. During 2002, at least eight right whales entangled in fishing gear, and six were thought to have died. It is now May 2003. Kraus had to cancel another attempt to repeat the whale safe fishing line project in 2003, and he still has no prediction from the NMFS Permit Division as to when his permit will be issued. There may be a new determination of a need under NEPA for an Environmental Impact Statement for his permit, not just an Environmental Assessment.

Let me recap. The survival of right whales in the North Atlantic is threatened because so many are killed from entanglement in fishing gear and from vessel collision. Unlike any airline, as a scientist, Kraus needs a permit to fly over right whales, in case the whales might hear the plane and somehow be disturbed. Delays in permitting endanger his ability to fly surveys designed to warn ships of the presence of whales. The ships that regularly kill whales are subject to no regulation, and travel wherever they please at any speed through critical habitats of the most endangered whale in US waters. In spite of some fisheries regulations, whales are dying in fishing gear at alarming rates. Fishermen can

continue to place lethal fishing gear where it can kill whales, but Kraus cannot test new ideas for whale safe fishing gear, because the environmental paperwork for his research is not sufficient, even after 21 months of delay. Is there something wrong with this picture?

I have also personally had experience with the mad world in which Federal actions block the research needed to protect marine mammals from poorly regulated impacts of human activities. We cannot protect marine life from intense underwater noises until we get better at detecting when a marine mammal or sea turtle is in the danger zone. Recently, there have been promising developments for whalefinding sonars. These are high frequency sonars that work like fish finders to detect echoes from animals close enough to be harmed by unintentional exposure to intense sounds. When these whalefinding sonars reached the point in their design process where they were ready to be tested at sea, I submitted an application to amend my research permit to test how well a whalefinding sonar could detect migrating gray whales. We know how migrating gray whales respond to noise, and we expected little if any behavioral response to the whalefinding sonar. The study was designed with very sensitive methods to detect whether whales avoided the sound source by a hundred meters or so, and we requested permission to “take” the whales by harassment.

The Permit Division of NMFS issued the amendment to my permit in a timely fashion, but only after deciding that the amendment did not require a new environmental assessment. The environmental assessment conducted by NMFS for my original permit had already covered testing a whalefinding sonar on whales. The wording allowing “takes” of gray whales alarmed an animal rights advocate in Australia, who gathered a few small fringe groups in the U.S. to request an injunction against the research the day before the study was to begin. The study was delayed by a temporary restraining order and the entire field team and one of the research vessels in our national oceanographic fleet were tied up for most of the month planned for the research. In the end, the judge ruled that the amendment to my permit was invalid because the NMFS Permit Division had not prepared a new Environmental Assessment under NEPA not just for my original permit, but for each major amendment to the permit. Hundreds of thousands of taxpayer dollars were wasted and we are a year behind in developing more effective methods for monitoring marine mammals.

The NMFS Permit Division of the Office of Protected Resources has just nine personnel and is increasingly inundated. In 2001 they advised scientists applying for a permit to expect processing times of at least 90 days for most marine mammal permits with an additional 135 days for permits affecting endangered species. However, some permits have been subject to greater delays. NMFS currently advises scientists to allow at least 6 months for processing a permit, longer for research involving endangered species. In the cases of my and Kraus’ permits, it appears that last minute complaints by a fringe extremist could trigger a “public controversy” condition requiring exhaustive environmental assessments. Given these precedents, I consider that only permits backed by environmental analyses acceptable under NEPA are solid enough to protect research from nuisance lawsuits. My understanding is that it typically takes several months and \$50,000-\$100,000 to produce an Environmental Assessment, and \$500,000-\$1,000,000

and 1-2 years to produce an Environmental Impact Statement. Due to the increasing number of scientific research permits, and the renewed emphasis on NEPA analysis, some permit applications may be delayed much beyond 6 months, with dramatic increases in the burden on the Permit Division and on the applicants. I can personally attest to the heroic efforts of the staff of the Permit Division to cope with this disastrous situation, but the Division requires additional support and staff to keep the permitting process afloat.

Congress has in the past few years taken strong steps to fund research to help resolve urgent conservation problems such as declining populations of Steller sea lions, or the threat of extinction for the North Atlantic right whale, and I applaud these actions. Yet both of these research efforts were delayed by more than a year because of delays in the permitting process for scientific research. Recent litigation has highlighted the importance of adequate NEPA analysis in order to issue legally defensible permits. If Congress wants to support critically needed conservation research, it is not enough to fund the science. Congress will also have to authorize significant increases in funding to the Permit Division.

The time required to obtain a research permit has swelled from 3 months to 6 months to 21 months and counting. A very important change suggested by the NRC would be for Congress to specify a fixed maximum time for NMFS to process permits and authorizations. The 1994 NRC report suggested 10 days for initial processing, 30 days for the public comment period, and 10 days to issue or deny the permit. The Permit Division used to use a more liberal 30 days for initial review, 30 days for the public comment period and a concurrent 45 days for review by the Marine Mammal Commission, and 30 days to issue or deny the permit. This totals to 105 days. **I urge Congress to follow the recommendation of the NRC and set deadlines of 3-4 months for issuing a permit for scientific research.**

The failure of NMFS to prevail in recent challenges to their attempts to exempt the permitting process from further environmental review under NEPA suggests the need for Environmental Assessments or Environmental Impact Statements for each activity that may be permitted or authorized. I cannot imagine that even a newly invigorated Permit Office could perform these analyses for every project, although there is considerable overlap between the permitting process under MMPA and the environmental analyses under NEPA. Given how similar the two processes are, perhaps Congress could specify the categorical exclusion of these permits under the MMPA. Otherwise, the MMPA or regulations might specify programmatic environmental analyses of specific research procedures, such as aerial or vessel survey, tagging, biopsy sampling, sound playback, etc. As I discuss later in my testimony, these kinds of programmatic environmental analyses are urgently needed for setting regulatory priorities not just for research, but for all incidental harassment.

The only way for the permitting process to proceed in a timely fashion given the requirements for environmental analyses under NEPA will be for the Permit Division to conduct programmatic environmental analyses for most typical research activities well

before applicants request a permit. This additional workload must be achieved while the ongoing flow of permit applications is expedited. If NMFS is to issue timely and legally defensible permits, the permit division and other supporting divisions in the Office of Protected Resources will need additional program staff, with specialists in many areas such as environmental law, NEPA, marine mammal population biology, acoustics, animal health and welfare. Congress will also have to authorize significant increases in funding for the Office of Protected Resources to hire contract personnel or to outsource the analyses required under NEPA and the ESA.

Ironically, it appears that the more serious the conservation problem addressed by a research project, the more likely the project is to be attacked by extremists and delayed or cancelled. One side effect of the permit process is that it personalizes a project in the name of a scientist. When a ship hits and kills a whale, when dolphins die in fishing nets, when a sea turtle is killed in an underwater explosion, the impact is no-fault and impersonal. But when a scientist applies personally for a permit to help solve these problems, he or she is front and center in a very public process. This makes the scientist an all too easy target for uninformed emotional attacks against the bigger problem. The “Tyack permit” is the subject of misinformation in websites from Australia to the UK.

Some animal rights groups have specialized in attacking biological research; it has become all too easy for less scrupulous groups to move from attacking suffering and pain induced by experiments in captive animals, to raise funds by misrepresenting research directed at helping to protect wild animals from serious threats. Activists have actually tried to sabotage some conservation biology projects with threats of violence and destruction of property. It may reduce the attractiveness of these cynical *ad hominem* attacks if research institutions or consortia were to apply for general authorizations for different kinds of research, much as other activities that may “take” marine mammals are authorized.¹

One suggestion for reducing the regulatory burden on scientific research involves including scientific research under the definition of harassment for military readiness. This is not helpful for research on marine mammals, and could create new problems for marine mammalogists. The US Office of Naval Research is the primary funding agency for basic marine mammal research in the US. In spite of the excellent reputation of ONR as a science agency, the location of this agency in the Navy has led to controversy about whether the Navy biases the research effort or compromises the integrity of the scientists

¹ A problem with the language of the MMPA involves the use of the word “take” to cover the potential for an activity to cause slight and temporary changes in behavior. In this age of the internet, it is quite easy for people all over the world to hear of a permit allowing thousands of “takes” of marine mammals. It is difficult for people from many countries to find it credible that the U.S. would regulate the potential for any change in behavior, so it can easily appear that this permit allows “taking” in the normal English sense, which sounds quite drastic. I urge the language of the permitting process be changed to use “take” for lethal take, “injury” for level A harassment, and “disrupt” or “disruption” for level B harassment.

it funds. Fringe groups have even tried to drum up support by conjuring up conspiracy theories claiming that critical conservation biology projects are secret Navy projects to target marine mammals. If Congress were to change the wording of the MMPA to lump scientific research under military activities, this would increase concern about the relationship between the military and marine mammal research, and could accelerate the attacks by anti-research animal rights groups.

I must emphasize that many of the most serious problems with marine mammal research permits have not been MMPA problems as much as NEPA problems. Changing the definition of harassment will not affect the need for marine mammal researchers to obtain permits for their scientific research. Whatever the definition of harassment, I would apply for a permit for my research on marine mammals. Most scientific journals require permits as a condition of publication. The problems I face as a scientist involve the uncertain delays of the permitting process, and the vulnerability of the permits to procedural challenges. As I mentioned above, the Office of Protected Resources will require a considerable injection of funds and highly skilled personnel to be able to issue permits in a timely fashion while overseeing the timely production of the NEPA documentation required to back up research permits.

Suggested unified procedure for authorizing incidental takes under the MMPA

Congress today is attempting to fix demonstrated problems with authorization under the MMPA of incidental takes, especially harassment takes. One way to deal with this problem is to tailor special exemptions for each special interest powerful enough to get the attention of Congress. This process has created a complex tangle of different authorizations for taking marine mammals under the MMPA. The basic goals of the Act clearly have not been well served by such different standards for regulating takes for different activities. As the NRC said in 1994, "it is difficult to understand applying different, and less stringent, rules to activities that kill marine mammals than to activities that are known to benefit them or to have negligible effects on them." Furthermore, if Congress restricts this year's solution to military readiness, next year they will be likely to have to respond to similar needs of some other group such as the seismic or shipping industries. I believe that it would be much better if Congress rejects the special exemption approach, and instead corrects the deficiencies in the MMPA so that one or two simple regulatory processes for authorizing incidental takes could be applied evenly to all seafaring activities. These processes should be designed to focus regulatory effort on situations of potential adverse impacts while minimizing the regulatory burden for activities with negligible effect. If a streamlined and more inclusive authorization process were accompanied by better monitoring and reporting requirements, then we would be in a much better position to identify and devote scarce regulatory resources to situations where marine mammals are most at risk from human activities.

Please allow me to sketch an outline of such an approach based upon suggestions from the 1994 and 2000 NRC reports on Marine Mammals and Low-frequency Sound. These

reports approve of the amendments to the MMPA that were adopted in 1994 regarding taking of marine mammals incidental to commercial fishing. The incidental take provisions of the MMPA for commercial fisheries require determination of whether the incidental mortality and serious injury from commercial fisheries will or will not have a negligible impact on marine mammal stocks. Fisheries are categorized as to whether they have frequent, occasional, or remote likelihood of causing mortality or serious injury, and each fishery receives an authorization for incidental takes subject to conditions. As long as a fisher registers with this authorization process, complies with the conditions, and reports any takes, s/he is exempt from the prohibition against taking.

This regime for regulating fishery takes that may kill animals has been quite successful in highlighting situations where populations are threatened by fishing. Fishers in low impact fisheries have a simple and streamlined regulatory process that protects them from prosecution in case of an unlikely accident, and regulation ramps up corresponding to the threat, up to closing down fisheries that threaten the survival of marine mammal populations. The 1994 National Academy Report on Low-frequency Sound and Marine Mammals approves of the way this regime sets priorities for regulation:

The proposed regime is designed to redirect regulation to focus on human activities with the largest impact on marine mammal populations, scaling the extent of regulation to the risk the activity poses to populations. (p 35)

However, the reports highlight two flaws in this approach: the regime ignores effects of harassment, and is not systematically organized to include takes such as vessel collision, explosions, etc.

The effect of MMPA section 118 has been to exempt fisheries from the prohibition on harassing marine mammals. The solution to this problem and to the imbalance in regulation of harassment is to develop a process to tier all sea-faring activities into categories for potential harassment takes of negligible impact, possible impact, and high probability of impact. Each kind of sea-faring activity that might take marine mammals by harassment should be required to consult with NMFS to perform an environmental assessment to evaluate the potential for impact. This kind of environmental assessment is already required under NEPA and many recent court cases have shown that NMFS and sea-faring activities must conduct additional environmental assessments. I believe that in the current climate, even harmless activities are vulnerable to legal challenge unless covered by this kind of NEPA analysis and MMPA authorization. There should be a simple streamlined process for authorizing low impact activities, with increased regulation scaling with increased probability of impact. A general authorization process is essential for activities that may affect the behavior of marine mammals, but that would have negligible impacts. Activities that are not eligible for this general authorization would need to go through an incidental take authorization process on a case-by-case basis. I urge Congress to require a consultation process to allow NMFS to tier activities by expected impact with a streamlined process for general authorization of activities with negligible impact and a requirement for regulatory effort to be directed to cases with the highest expected adverse impact.

The regime for regulating lethal takes or serious injury under section 118 of the MMPA has a flaw that may prove fatal to marine mammal populations, like right whales, where significant incidental mortality stems from activities other than fishing. The solution to this problem suggested by the NRC 2000 report is to broaden this regime to include other activities that might kill or seriously injure marine mammals. Obvious examples include vessel collision, underwater explosions, and spills of toxic compounds. Section 118 of the MMPA includes a comprehensive program to monitor takes from fisheries, but there is no such program to guarantee that stock assessments accurately estimate mortality from non-fishery activities. If mortality caused by these non-fishing activities is not included in the PBR regime, then the regime will not work properly to protect marine mammal populations.

The MMPA as currently written specifies a process to reduce takes from fisheries whose lethal take exceeds PBR, but it is silent as to how to regulate incidental lethal takes from activities other than fishing. If vessels strike and kill a whale for example, should this be subtracted from the PBR? Or should these non-fishing activities be incorporated into a process for allocating takes? A similar situation may hold with beaked whales. About 10 beaked whales were regularly killed off the US Atlantic EEZ in a pelagic drift gill net fishery. This was listed as a strategic stock because of uncertainty about the stock size relative to fishery-related mortality. This fishery has now been permanently closed. However, a correlation has recently been found between beaked whale strandings and naval maneuvers involving active sonars. The 2002 NMFS Stock Assessment for these beaked whales states “This is a strategic stock because of uncertainty regarding stock size and evidence of human induced mortality and serious injury associated with acoustic activities.” If there are situations where non-fishery takes may be as significant as takes by fisheries, the MMPA must be modified to clarify how to regulate all lethal takes and serious injury, whether from fisheries or other sources.

The process for general authorizations of user groups could be similar for harassment or lethal takes. I suggest that different user groups that may take marine mammals could either voluntarily form together or be designated by NMFS. The list of user groups must include all activities that may take marine mammals. Either the user groups or NMFS should be required to prepare a Programmatic Environmental Impact Statement, an Environmental Assessment, or some simpler form of analysis depending upon NEPA criteria, including whether takes, including harassment takes, were anticipated to be frequent, occasional, or occur with a remote likelihood. After this stage, some activities might be judged so low risk that they could apply under a general authorization with simple reporting requirements. For activities where the takes are judged to have the potential for higher impact, each user group could apply for incidental take authorization similar to those currently in the MMPA, or to that used now by commercial fisheries, but including takes by harassment. Each user in a high impact activity would be required to evaluate the potential impact of each use, taking into account the animals in the specific areas and seasons of operation. All users should be required to report any takes, including level A or B harassment takes, with strict requirements for prompt and complete reporting. For activities that might cause harassment takes beyond the range of detection

of the vessel, a monitoring program could be established to study animals at different ranges from the activity in order to better estimate the number of harassment takes.

The PBR process limits lethal takes to a number small enough not to threaten the population. It is more difficult to set a limit on harassment takes, since these may vary greatly in impact, and since the effect on population growth may be difficult to predict. Ultimately, the significance to the population of any take is the effect on the demography of the population, the ability of the population to grow or remain a healthy size. I strongly encourage Congress to adopt wording requiring NMFS to account for harassment takes conservatively in terms of demographic effects on growth, survival or reproduction. This is currently a challenging scientific problem, but the correct wording would stimulate the appropriate science, while focusing attention on the critical issue of keeping marine mammal populations healthy. The criteria do need to acknowledge our ignorance of the scope of harassment, and our ignorance of many of the effects harassment may have on individuals and populations. If we wait until the population has measurable declines, it is too late. Therefore it is important to include indicators of adverse impact in the criteria. These indicators may be physiological, behavioral, or ecological, but must be linked to potential to affect demography.

As I discuss more fully in the last section of my testimony, the best way to do this is to define harassment in terms of biological significance of the take. For the purposes of initiating a regime to regulate harassment takes before we know the precise effect of an activity on the population, NMFS could start by requiring complete and accurate reporting of all potential takes, including any disruption of behavior. The inclusion of any disruption of behavior should not be interpreted to signify that all of these constitute "takes" under the MMPA. Rather, accurate reporting of behavioral disruption could be used to help identify what exposures pose a risk of adverse impact.

Ultimately a demographic accounting of harassment takes would require population modeling that relates the dosage of exposure to harassment to population parameters. There has been great progress in this kind of population modeling in the past decade. However, right now the critical analyses could not be performed for harassment takes because we know so little about exposures of marine mammals to harassment. Some mechanism to improve the accuracy of reporting and estimating harassment takes must be added to the regime. The PBR process has forced NMFS to sharpen its stock assessments for marine mammals, including summarizing all known lethal takes. A critical aspect of the PBR regime is that it exempts registered fishers from the prohibition on taking as long as they accurately and fully report any takes. A similar clause for all vessels that may be involved in harassment would ultimately give scientists the data needed to regulate harassment in terms of biological significance of impacts to populations. As in the terms of permits for scientific research, the user should report any observed disruption of behavior, but the regulations should be clear that not all of these will ultimately be considered "takes" by harassment. A timely reporting requirement may also make it easier to prosecute cases of intentional harassment, as failure to report would violate the terms of the authorization.

This kind of program would allow NMFS to identify situations where

- A stock was at risk from a particularly high number of takes.
- An area or activity caused a high number of takes for a variety of species.
- There were particular hot spots of takes.
- The cumulative takes pose a risk to the population

Where the sum of takes, lethal, injury, or harassment, pose a risk to a population, this regime should require something like the take reduction plans used to reduce the problem of fisheries takes. This kind of regulatory regime would reduce the burden on activities that pose little risk, while focusing attention on species, areas, or activities that pose the greatest risk to the most endangered populations.

Some may be concerned that the regulatory process I sketch out would lead to reduced protection. It would certainly streamline the regulatory process and make it more predictable for most activities, but I agree with the National Academy (2000) report on Marine Mammals and Low-frequency Noise that such a change would, if done correctly, increase protection from the status quo. The current MMPA has unbalanced criteria for authorization, allowing some fisheries to kill animals with no requirement beyond reporting, while having no procedure available to other activities to authorize more than a small number of insignificant harassment takes. This does not meet the conservation goals of the Act.

Suggested rewording of incidental take authorization for effects of noise.

While I believe there is an opportunity to improve the MMPA by reducing the maze of take authorizations, this may not be possible to achieve this year. If Congress cannot achieve a common mechanism for authorizing incidental takes, I would advocate simple changes to the existing incidental take authorizations in sections 101.a.5.A and 101.a.5.D that I believe would make them appropriate for regulating acoustic impacts. When the MMPA was first written, it emphasized takes in commercial fisheries. Certainly no one at that time was thinking about whether the regulatory process would work for issues such as incidental harassment takes resulting from unintentional exposure to noise. Nor was there much experience with issues under NEPA of whether the impacts of entire activities needed to be evaluated together, or whether it was better to authorize each time a “take” was possible.

Since the MMPA was passed, many studies have demonstrated that marine mammals respond to ships, dredging, icebreaking and construction, and sound sources such as pingers, air guns, and sonars. Most of these sound sources are currently unregulated simply because NMFS chooses not to enforce the prohibition against taking marine mammals by harassment. I doubt that many of these activities could find a regulatory procedure under the current wording of the Marine Mammal Protection Act that would allow activities with negligible impact while controlling those that might have an adverse

impact. As has been pointed out by each of the three National Academy reports on this topic, the dominant source of manmade noise in the ocean is the propulsion sounds from ships. Yet this has not been regulated by NMFS. As the National Academy 2000 report *Marine Mammals and Low-frequency Sound* put it:

If the current interpretation of the law for level B harassment (detectable changes in behavior) were applied to shipping as strenuously as it is applied to scientific and naval activities, the result would be crippling regulation of nearly every motorized vessel operating in U.S. waters. (p. 69)

One response to this conundrum is for each activity to seek special exemptions if their activities become targets of regulation. However, the National Academy 1994 report *Low-Frequency Sound and Marine Mammals* discouraged that approach:

“However, it seems unreasonable that an exemption from the “take” prohibitions of the MMPA should be available for some human activities, including some that kill marine mammals, without being available for other human activities whose goal may include the acquisition of information of potential value for the conservation of marine mammals.” (p 38)

The first two reports of the National Academy of Sciences on *Marine Mammals and Low Frequency Sound* specifically suggest a broader solution to this problem: removing the requirements for small numbers of takes, while retaining a criterion of negligible impact:

Reword the incidental take authorization to delete references to “small” numbers of marine mammals, provided the effects are negligible. (p. 39)

Low frequency Sound and Marine Mammals (1994)

In addition to making the suggested change in the level B harassment definition, it would be desirable to remove the phrase “of small number” from MMPA section 1371(a)(5)(D)(i). If such a change is not made, it is conceivable under the current MMPA language there would be two tests for determining takes by harassment, small numbers first, and if that test were met, negligible impact from that take of small numbers. The suggested change would prevent the denial of research permits that might insignificantly harass large numbers of animals and would leave the “negligible impact” test intact. (p. 71)

Marine Mammals and Low-frequency Sound (2000)

My understanding of the judge’s ruling in the legal challenge to operation of the SURTASS LFA sonar, *NRDC v Evans*, is that the judge ruled against the interpretation followed by NMFS that “small” can be interpreted in terms of population size, and exactly following the fears of the National Academy panel, ruled that the current MMPA language does require both negligible impact and small numbers, where the meaning of the word small could not be interpreted in terms of size and status of populations.

The restriction in the MMPA authorizations for incidental takes to “a specified geographical region” may also rule out this authorization process for most impacts of noise. If “specified geographical region” is taken to mean areas small enough to involve the same assemblage of species and oceanographic conditions, the requirements of the

incidental take authorizations would be incompatible with the NEPA requirement to consider all possible uses of a system. Many sound sources are on a large number of vessels, each of which may cross the ocean in weeks. Many marine mammals also migrate thousands of miles through very different habitats. This makes it difficult to specify a geographical region for a whale that may be in the Caribbean one day, and off New England a few weeks later. Different marine mammal populations have boundaries that differ according to the ecology and migratory patterns of the species. This makes it impossible to identify a unique region that is homogeneous for all marine mammals, much less other aspects of the marine ecosystem. If the wording specifying a geographical region is to be reconciled with the potential numbers and movements of both the animals and the noise sources, then the region must be specified in terms of the scope of the activity, not homogeneity of the ecosystem.

The propulsion sounds of ships elevate the ambient noise over the world's oceans, and this global impact is likely to reduce the ability of whales to detect calls at a distance. I see no process by which such takes could be authorized under the current wording of the MMPA. Depth sounders and fish finders have sounds that do not carry as far, but they are used by tens of thousands of vessels. These sounds have the potential to disturb marine mammals, and therefore may take animals by harassment, but did Congress intend to require authorization for each user? How far could a vessel go before its takes move out of the "specified geographical region?" Oceanographic research, much of which uses motorized vessels and uses sound as a tool to explore the ocean, also has a global scope, and may be difficult if not impossible to authorize under the current regulatory procedures.

I urge the Senate to change the wording of the incidental take provisions of the MMPA to remove the conditions of small numbers and specified geographical region. I believe that as long as a sharp focus is maintained on the issue of negligible impact, these changes would make the process work for effects of noise on marine mammals, while still protecting marine mammal populations from adverse impacts. Since millions of sound sources such as depth sounders and the propulsion noises of every motorized vessel could cause harassment takes under the current definition, I believe that it will be essential for the process to authorize general activities, rather than individual vessels or sound sources. This is incompatible with restricting the authorization to "small numbers," if this is taken literally to mean just a few individuals, or "specified geographical region," if this is taken to mean small areas.

Definition of harassment

The current definition of level B harassment in the MMPA is:

"has the potential to disturb a marine mammal or marine mammal stock in the wild by causing disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering."

The 1994 NRC report on Low Frequency Sound and Marine Mammals succinctly reviewed the problem of how harassment has been interpreted under the MMPA:

Logically, the term harassment would refer to a human action that causes an adverse effect on the well-being of an individual animal or (potentially) a population of animals. However, “the term ‘harass’ has been interpreted through practice to include any action that results in an observable change in the behavior of a marine mammal” (Swartz and Hofman, 1991). (p. 27)

The 1994 NRC report goes on to note that many minor and short-term behavioral responses of marine mammals to manmade stimuli are simply part of their normal behavioral repertoire. There is clearly a need for some standard of negligible effect, below which a change in behavior is not considered harassment.

The change in the definition of level B harassment proposed by the Administration and in HR 1835 is:

“disturbs or is likely to disturb a marine mammal or marine mammal stock in the wild by causing disruption of natural behavior patterns, including, but not limited to, migration, surfacing, nursing, breeding, feeding, or sheltering, to a point where such behavioral patterns are abandoned or significantly altered.”

As a biologist who has studied the behavior of marine mammals for more than 25 years, I find this wording confusing, and I do not see how it addresses the problem identified by the NRC. The last phrase added to the definition does add a criterion of significant alteration. However the point of the NRC reports was *biological* significance, a disruption that could have an adverse impact. My dictionary defines significant as “likely to have influence or effect.” The addition of the word “significant’ in the new definition therefore does not give the same standard as suggested by the NRC. As our techniques to study marine mammals have grown in sophistication and sensitivity, it is now possible to demonstrate statistically significant alerting or orienting responses that in my opinion fall well below the negligible impact standard.

I find the addition of the word “abandoned” particularly confusing in the new definition. It certainly makes sense to add a criterion for abandonment of critical habitat, but what does this wording mean for behavior patterns? A sperm whale or elephant seal can dive for an hour or more, but any marine mammal that abandons surfacing behavior cannot breathe. If it abandons surfacing for more than a few hours, it is certainly dead. If a sperm whale group is sheltering a young calf from a killer whale attack, even a momentary abandonment of the behavior could be lethal. Calves may be able to survive for days or weeks if their mother abandons nursing, and many whales could survive for years without feeding, but what is the time period implied by “abandon.” My understanding of “abandon” is that it means a permanent change. By this definition, the “abandonment” wording turns level B harassment into a lethal take. Far from distinguishing negligible from potentially significant effects, it muddies the waters further.

Another problem with the use of the term “abandon” is that I take it to mean “giving up” -- a 100% cessation of an activity. Yet since the definition of harassment also applies to stocks, this definition is not conservative enough for actions that may affect a large portion of a stock. For example, suppose an activity caused a 50% reduction in foraging rates in a majority of the population, or caused animals to be 50% as effective in finding a mate for breeding. Such reductions would not “alter” the form of the behavior, nor would they meet an abandonment criterion, but few populations could sustain such changes on a long term basis.

If the Senate chooses to base harassment on the Administration definition, I urge that the definition drop the confusing use of the term “abandon,” and that it define “significantly altered” in terms that parallel the usage of biological significance by the NRC.

I am also very concerned that the harassment definition proposed by the Administration retains the problematic old harassment definition for activities directed at marine mammals. This will retain the problematic definition for scientific research directed at marine mammals. While there is a process to permit such research, retaining the old definition for activities directed at marine mammals will hold scientific research that enhances the survival or recovery of species or stocks to a stricter standard than activities that harm marine mammals and do not help them. This does not make sense. The only case that in my opinion justifies a lower level of regulation involves takes for scientific research that enhances the survival or recovery of species or stocks. The proposed changes have the opposite effect.

NMFS has suggested retaining the old harassment definition for activities directed at marine mammals so that they can more easily prosecute cases against businesses such as those that charge people to take them to swim with wild dolphins. I believe that any of the proposed harassment definitions fit very well these cases where people intentionally pursue marine mammals and annoy them with clear disruption of behavioral patterns. It is particularly strange that NMFS suggests retaining the old broad definition, when a senior NMFS enforcement attorney stated to the 2002 Annual Meeting of the Marine Mammal Commission “the potential to disrupt behavioral patterns, at one level, it is a great definition because you go out, you know, we can get whatever we want because it is a very broad definition, but when you get down to the prosecution level, it is too broad.” The real problem with harassment in my opinion is that NMFS has not shown the will to enforce the prohibition against harassment and to prosecute cases against growing industries based upon harassing marine mammals in the wild. It would be a tragedy for scientific research to be excluded from corrections in the definition of harassment as cover for NMFS’ unwillingness to enforce the prohibition against harassment.

If there are problems with the definition of harassment, the solution is to reword the definition so that it can be used for all activities. I would like to take this opportunity to reiterate the suggestion of the National Academy of Sciences second report (2000) on Marine Mammals and Low Frequency Sound on the definition of level B harassment:

“NMFS should promulgate uniform regulations based on their potential for a biologically significant impact on marine mammals. Thus, level B harassment should be redefined as follows:

Level B – has the potential to disturb a marine mammal or marine mammal stock in the wild by causing meaningful disruption of biologically significant activities, including, but not limited to, migration, breeding, care of young, predator avoidance or defense, and feeding.

The Committee suggests limiting the definition to functional categories of activity likely to influence survival or reproduction. Thus, the term “sheltering” that is included in the existing definition is both too vague and unmeasurable to be considered with these other functional categories.” (p 69)

This definition was written by scientists and may require an additional definition of “meaningful disruption” to fit legal and legislative requirements. In particular, the definition of harassment must take into account our lack of knowledge about the ways in which behavioral changes may influence marine mammals. For example, prolonged or repeated harassment may lead to physiological changes that do not qualify as injury, but that may indicate the potential for adverse effects. Prolonged changes in behavior that are outside of the normal behavioral repertoire of a species may also trigger concern even if the effect on health is not immediately obvious. But if the definition of harassment is to be changed, it should be done so in a way that makes biological sense and that corrects the need for a negligible impact standard. I do not think that the changes proposed by the Administration and in HR 1835 for the definition of harassment succeed in this task. I urge the Senate to consider using the definition of harassment suggested by the National Research Council in any amendments to the MMPA.

Conclusion

Madam Chair, I sincerely appreciate your attention to this difficult and complex issue. There are real problems with current implementation of the MMPA in our changing environment. However, I am convinced that Congress and the responsible federal agencies can make real progress to create permitting and authorization processes that are more predictable and efficient, while improving the protection for marine mammals from adverse impacts of human activities.

Thank you, and I look forward to your questions.