

"SEA CHANGE-- PLANNING FOR THE FUTURE WITH LESSONS FROM THE PAST"

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Greetings Mr. Chairman and members of the Commission. I am Sharon Young, Marine Issues Field Director for the Humane Society of the United States, which is supported by more than 7 million members and constituents. I would like to thank you for the opportunity to address this commission with our perspective and concerns regarding ocean policy as it affects marine mammals.

As our populations increase and our technologies become more complex, so too our impacts on them become complex and far-reaching. In the past, human impacts on marine mammals were confined to directed activities such as whaling, sealing and killing of nuisance animals that resulted in the deaths of millions of marine mammals. To our later chagrin we learned, as we have with virtually every resource that we have exploited, that animal populations are not infinite and not all are quick to rebound from our excesses. (Ludwig et al 1993) As a result of popular outcry against whaling, sealing and the inadvertent by-catch of dolphins in tuna nets, the Marine Mammal Protection Act came into being in 1972. The Report of the House Merchant Marine Committee stated at the time that such legislation was necessary to rectify man's impact on marine mammals "which has ranged from what might be termed malign neglect to virtual genocide." So, thirty years after this landmark legislation have we "saved the whales"? What has our experience taught us? What shining examples should we follow? What pitfalls should we avoid?

Our impacts have become less targeted and harder to understand. No longer can we measure our impacts by counting dead bodies on the decks of ships. Marine Mammals are seriously injured or killed as incidental bycatch in commercial fisheries; they are struck and killed or injured by both recreational and commercial vessels; in some areas they compete with commercial fisheries for common food resources; increasing noise in the oceans may affect their ability to forage or communicate effectively; coastal pollutants degrade habitats and may bioaccumulate to the extent that they compromise health and reproduction; ecotourism and an increased desire to feed or swim with them may harass or harm them; and nuisance animals are still killed albeit clandestinely. And year by year we learn of impacts that were not predicted until unexplained deaths were noted. In the Gulf of Maine, we see in microcosm many of these effects and both the positive and negative impacts of our stewardship.

Incidental Bycatch in Commercial Fisheries

The 1994 amendments to the Marine Mammal Protection Act (MMPA) established a formula for calculating the maximum number of animals from each marine mammal stock that can be killed as a result of human interactions without causing decline or preventing a stock from reaching its Optimum Sustainable Population. The resulting number for each stock is called the Potential Biological Removal Level or PBR. According to the National Marine Fisheries Service's (NMFS) most recent stock assessment, incidental mortality and serious injury to stocks on the U.S East Coast exceeds the PBR for six stocks of marine mammals. (NMFS 2001) With the exception of the Florida Manatee, this serious injury and mortality is largely a result of bycatch

in commercial and recreational fisheries. These fishery-related impacts are most acute in federally listed Endangered Species such as North Atlantic right whales (*Eubalaena glacialis*) and Humpback whales (*Megaptera Novaeangliae*), in federally listed depleted stocks such as coastal Bottlenose dolphins (*Tursiops truncatus*), as well as common dolphins (*Delphinus delphinus*), and at least one additional stock of bottlenose dolphins on the east coast. In addition, in many years, incidental mortality of stocks of both Atlantic white-sided dolphins (*Lagenorhynchus acutus*), and Gulf of Maine harbor porpoise (*Phocoena phocoena*) have exceeded the PBR. At the time of the 1994 amendments to the MMPA, the greatest concern was immediate and severe impacts on right whales and on harbor porpoise.

One of the lessons learned from past management mistakes was that top down management was not always effective. Dictates from faceless bureaucrats were often held in disdain by fishermen and even by conservation interests who felt that policy setting was removed from public process and often disjunct from the real world. To that end, the MMPA put in place a mandate for so-called Take Reduction Teams which were to be comprised of representatives of industry, government, conservation groups and academic institutions. These multi-stakeholder teams were to focus on developing strategies that were expected to reduce mortality and serious injury from commercial fisheries to PBR within six months of their implementation. The HSUS has served on most of the Take Reduction Teams, and I find that these teams have met with mixed success.

Mortality of Gulf of Maine harbor porpoise dropped from over 2,000 animals per year in the 1990's to an average of 382 this past year; a number that is finally below the PBR of 747. This would seem to be good news, but much of the reduction in mortality has not come about as a result of regulations implemented to protect harbor porpoise. In fact, mortality declined largely because closures implemented to conserve ground fish in the Gulf of Maine have resulted in shifting and reduced effort to times and places that reduce harbor porpoise deaths. The NMFS did not even issue the consensus plan put forth by the Take Reduction Team until it was sued by the HSUS and The Center for Marine Conservation and this plan relies largely on the fishery management closures. As a result, any conservation benefits that accrue to porpoises may be lost if the Fishery Management Council changes the placement or timing of any of the current closures. NMFS should heed the advice of the Take Reduction Team and place conservation measures for porpoises under the MMPA rather than the Magnusson Act.

Similarly, the Take Reduction Team tasked with reducing mortality of endangered large whales, especially North Atlantic right whales, was not convened until NMFS was sued by a conservation group (Greenworld Inc.). When the initial plan was released, pressure from Congressional delegations at the behest of fishermen, forced the NMFS to change the plan to one that it itself acknowledged was based largely on "current best fishing practices." When the plan failed, and both right whales and humpback whales continued to be killed or seriously injured at unacceptable levels, the NMFS did not modify the plan until after the HSUS and the Conservation Law Foundation file suit against the Service. NMFS' action also coincided with the well-publicized plight of the right whale "Churchill" who eluded attempts to disentangle him and eventually vanished. With right whales currently offshore of Massachusetts, an entangled right whale seen recently in the mid-Atlantic, and fishery restrictions that have already expired in Critical Habitat, we carefully watch to see what will happen. Prevention, not disentanglement is

the key.

At this time, despite a legal mandate to convene a take reduction team to address the issue of unsustainable mortality of pelagic dolphins and pilot whales no take reduction plan is in place. The pelagic longline fishery for tuna and swordfish, and the trawl fishery for squid, mackerel and butterfish, continue to kill and seriously injure these animals at rates above the PBR with no restriction. It would seem that the NMFS has not learned the lesson that if they do not uphold their legal obligations environmental groups are forced to sue to protect animals covered by the MMPA.

A key underpinning of the success of any effort to reduce incidental by-catch of marine mammals is a well funded and innovative fishing gear research program. Funds are often lacking and generally do not flow until a crisis situation develops. Indeed, necessity has proven to be the mother of invention. For example, fishermen insisted from the first take reduction team in 1996 until the gory and well-publicized death of a female right whale in 1999, that using line between lobster traps that hugged the bottom was not feasible and furthermore that their floating line did not pose a risk. When court action loomed, NMFS began to conduct trials on a neutrally buoyant line that fishes close to the bottom and eliminates the loops of line that underwater footage, shot by State funded efforts, finally showed was floating more than 40 feet up into the water column and well able snag feeding whales. The neutrally buoyant line worked well, is now in wider trial and seems to hold great promise for reducing risk. If not for the death of a mature female and threat of legal action, it is not clear that this research would have occurred in any timely fashion and mandated use of this line might well never have occurred. Proactive and innovative gear research efforts can save the government time and money and the lives of countless whales.

So it would appear that the lesson that stakeholders should be involved in the management process, has resulted in a process that seeks their integral involvement in achieving management goals. However, the recent use of these teams has shown us that the advice of these teams may not be sought or heeded until litigation forces the NMFS to act. This undermines the process and leaves stakeholders to continue to rely on age old tactics of political manipulation of the management process or litigation in order to have their voices heeded. In order to avoid this sort of wasteful effort, the NMFS must follow its legal mandates and then act in a timely manner to implement the advice of its stakeholder panels.

Collisions with Commercial and Recreational Vessels

Most people are familiar with the plight on manatees in Florida, who are killed and injured by recreational boaters. Similar concerns exist to a greater or lesser extent in the Gulf of Maine. Both minke whales and humpback whales have been struck or killed by whale watching vessels. Many more have been struck by smaller recreational vessels.

The most extreme case of risk to whales from vessels is that of the North Atlantic right whale. It is estimated that over half of the deaths annually can be attributed to collisions with commercial vessels. Two thirds of this mortality occurs in US waters, the rest in Canada. As a result of this death toll the Canadian government has proposed moving the major shipping lane

near Nova Scotia out of the area with the greatest concentration of right whales. Despite the fact that we too have major shipping lanes and channels that cross right whale critical habitat in both the wintering grounds of the SE and in the feeding and nursery areas of Gulf of Maine, the US has not proposed any specific action such as slowing ship traffic, shifting lanes out of high use areas or confining ships to specific lanes that would reduce the likely area of impacts.

Over a year ago, the fisheries service received a report and recommendations from a ship strike committee it convened to seek input from shipping, conservation and scientific organizations on ways to reduce risk to right whales from shipping. NMFS has not proposed any specific action, but continues to rely on a system that requires ships passing in the area of critical habitat to call in to port so that they may be advised of recent right whale sightings. Mariners are advised to try to avoid right whales. This is hardly reliable, as survey planes can only cover a finite area; they make a single report on the day of the flight and they are unable to fly at night or even every day. For example, in the month of June 2002, when right whale concentrations were observed in and around the shipping lane, surveys were flown on only 13 of the 30 days. Clearly this is insufficient to reduce risk and its reliance on voluntary action is unacceptable.

The NMFS must take immediate action to limit risk to right whales from commercial ship traffic. If it heeded lessons of the past, it would act before it has to be sued to uphold its obligations under the Endangered Species Act.

Competition with Commercial Fisheries for Common Food Resources

You are no doubt aware of the controversy that surrounds the decline in stocks of marine mammals in Alaska, including Steller Sea Lions, Gulf of Alaska harbor seals and sea otters. One of the underlying theories is that competition with commercial fisheries has left animals with a diet of insufficient quality or quantity to support growth or even stabilization of populations. A similar issue has arisen in Hawaii with lobster fisheries and Endangered Hawaiian monk seals. While this issue has not reared its head in the northeast, there is some concern that as fisheries turn to additional target species to compensate for lowered effort in primary fisheries, that any significant increase in herring or mackerel fisheries has the potential to adversely affect piscivorous marine mammals such as endangered fin whales (*Balaenoptera physalus*) and humpback whales. If we are to learn any lesson from Alaska, then clearly fishery management plans must give serious consideration to preserving the prey base for endangered species.

Increased Noise in the Oceans

If it ever was, the sea is no longer silent. In 1972, when the Marine Mammal Protection Act was first authorized, we had no indication that underwater anthropogenic noise could adversely affect marine mammals. More recent studies both in this country and in Canada have found that noise from oil and gas exploration, airguns, ships, and even aircraft could cause behavioral changes in marine mammals ranging from cessation of normal activity to displacement from the areas in which the noise occurs. Furthermore recent reports (Richardson, et al 1995; NRC, 2000) have brought to light more in-depth information on potential adverse effects that expand on our

previous concerns and knowledge gaps about the effects of noise on marine mammals.

In a publication of the Natural Resources Defense Council (NRDC, 1999), Dr. Sylvia Earle states that “[u]ndersea noise pollution is like the death of a thousand cuts. Each sound in itself may not be a matter of critical concern, but taken all together, the noise from shipping, seismic surveys, and military activity is creating a totally different environment than existed even 50 years ago.”

The noise generated by commercial shipping appears to be the greatest single source of anthropogenic noise, but we still do not fully understand whether this noise is something to which marine animals have habituated and are not adversely affected or whether it may have caused some species or some age or sex classes of species to avoid shipping channels or alter their use of habitats in other ways that may be detrimental in its effect on long-term survival or productivity. It is extremely difficult to predict the long-term effects of this noise.

Not only is noise in the ocean generally seen as harmless, it is often seen as a panacea for a host of problems. Each year more and more uses of high intensity sounds are discovered or proposed and each not only adds to the ambient noise level that may eventually mask important biological sounds, but many of them also add to the potential to cause acute hearing loss or even death.

Uses of Sound by the U.S. Navy

The US Navy has proposed using Low Frequency Active Sonar to assist in monitoring the oceans for defensive purposes. Specifically, their Littoral Warfare Advance Development Program (LWAD) would rely on Surveillance Towed Array Sensor System Low Frequency Active Sonar (SURTASS LFA). While the Navy has maintained that it is unlikely to adversely affect populations of marine mammals, the NMFS has not made a final determination of whether a small-take authorization can be issued. The Humane Society of the United States is one of several plaintiffs who filed in September of 2001 to enjoin the conduct of any active sonar test or operations until the Navy conducts environmental studies required by the National Environmental Policy Act, obtains permits required by the MMPA, and consults under the Magnusson-Stevens Fishery Conservation and Management Act and the Endangered Species Act. In part, concerns arose out of the mass stranding of beaked whales and other pelagic species in the Bahamas in 2000. A joint report issued by the Navy and the NMFS acknowledged that “strandings coincided with ongoing naval activity involving tactical mid-frequency range sonar use in both time and geography.” It states that “the investigation team concludes that tactical mid-range frequency sonars aboard U.S. Navy ships that were in use during the sonar exercise in question were the most plausible source of this acoustic or impulse trauma.” Similar LWAD exercises have been tentatively proposed to occur in deep-water canyon areas off the Northeast where a large number of marine mammals, including beaked whales, forage in large numbers.

While we do not wish to compromise legitimate national defense needs, we believe that it is crucial that the US Navy consult broadly and prior to its activities involving use of loud and aversive sounds in the oceans so that possible effects can be weighed and areas can be identified

where the risk to marine mammals is likely to be lowest. While Naval use of sound may be the best publicized, it is by no means the only source of concern for effects of sound in the ocean.

Acoustic Deterrent Devices

A few well-publicized experiments have demonstrated the efficacy of low output, high frequency devices called “pingers” that are placed on fishing gear as deterrents to entanglement of small cetaceans. This has led to more and more fisheries seeking to use pingers. Their use is largely unregulated.

At a 1996 meeting jointly sponsored by the Marine Mammal Commission and the NMFS, international experts on sound were gathered to provide guidance on the use of acoustic devices in fisheries. The report of the Seattle meeting on acoustic deterrence recommended against using acoustic devices unless there is no non-acoustic solution available. I am a member of almost all of the NMFS take reduction teams and I find that, counter to this recommendation, acoustic devices are often the FIRST solution suggested as a means of reducing incidental bycatch rather than the last.

The Seattle workshop made a number of research recommendations; however, with the exception of some very limited research in the northeast, there has been little attention paid to the possibility of animals habituating to their sound and thereby reducing efficacy of the devices, or to the possibility of habitat exclusion if animals are displaced from areas in which the devices are in use.

Acoustic Harassment Devices

When the recommendations of the Seattle meeting on acoustic devices were published, they included a strong statement of concern regarding the expanded use of high frequency, high output acoustic harassment devices designed to exceed the pain threshold of target animals. These sorts of devices are in common use in finfish aquaculture here in New England and in the Pacific Northwest. Some of these devices have been demonstrated to displace non-target animals over 3 kilometers from a test device. The Seattle group advised the NMFS to conduct research of effects of these devices on target and non-target organisms and stated in part: “some form of licensing or prior authorization should be required for operational use of high-output devices.” In the six years since that meeting, these recommendations have gone largely ignored and these devices proliferate without licensing or regulation. Neither an Environmental Assessment nor an Environmental Impact Statement (EIS) has been undertaken to evaluate the effects of these devices on marine organisms.

The NMFS is currently working under administrative and Congressional mandates to dramatically expand aquaculture in US coastal waters with millions of dollars directed to be spent to facilitate this expansion. I have been in meetings and participated in task forces discussing how this may occur. The general concerns that are raised usually relate to water quality or potential interbreeding of non-native with native fish stocks; however, little attention is paid to the questions surrounding acoustic pollution, long-term hearing damage and habitat exclusion that may result from use of extremely loud acoustic harassment devices that have become de rigeur for finfish aquaculture sites.

We clearly need more research into the effects of these devices and the institution of a permitting system before further deployment is allowed. Additionally, NMFS should consider a programmatic EIS for aquaculture facilities that includes consideration of their interactions with

protected species, including the effects of acoustic harassment devices.

Proposals to use these high output harassment devices are proliferating. Similar devices, called pulsed power devices, were proposed for use on charter fishing boats to deter seals, despite opposition from marine mammal acoustics experts from the Woods Hole Marine Biological Laboratory and a number of Universities. The project had received federal support and was only stopped by the last minute intervention of the California Coastal Commission.

With greater awareness of the critical need to reduce the incidence of vessel collisions with North Atlantic right whales both passive and active acoustic devices have been proposed. Among the solutions being explored is the use of bow mounted acoustic harassment devices to “drive whales away” from the path of a large vessel. This sort of use would result in mobile sound sources broadcasting loud aversive sounds all along the eastern seaboard, which is prime feeding, foraging and breeding habitat for a variety of marine mammal species which may also be “driven away” from this habitat.

Longline and mid-water trawl fisheries express periodic interest in using acoustic harassment or deterrent devices and we are very concerned that, both here and abroad, marine mammals stand a significant chance of being excluded from important habitat if these sorts of devices are allowed to proliferate. Clearly federal regulation of acoustic harassment devices is long overdue and needs to occur before there is further proliferation of their use.

Sound Related to Seismic Exploration and Oil and Gas Extraction.

In 1999 I was invited by the Mineral’s Management Service (MMS) to speak at a meeting held in New Orleans for the purpose of reviewing and recommending research related the search for and extraction of mineral resources in the Gulf of Mexico. A number of those who were invited to speak raised concerns that previous exploration had been conducted without benefit of any baseline surveys to determine the diversity and abundance of marine mammals in the area prior to increased use of explosives and construction or destruction of oil drilling platforms. For that reason we do know the effect that this noise and disruption had on the previous distribution or abundance of animals in the Gulf of Mexico. Virtually all of the biologists and conservation group speakers urged that the MMS not expand leasing without first doing careful surveys to assess the use of the Gulf by marine mammals. Nevertheless, at the close of the meeting, a representative of MMS stated that they were already preparing to open yet another area of the Gulf without any of this recommended research.

As with almost any source of pollution be it chemical or acoustic, there are always some organisms or individuals of a species that are more resilient than others. The presence of SOME animals does not mean that others were not driven from the area by the pollution, nor that the habitat has not been significantly adversely affected. We believe that the NMFS has a responsibility to conduct a programmatic EIS of activities related to drilling and oil and gas extraction activities in the Gulf of Mexico, and it should require the MMS to maintain a vigilant research program to monitor activities and their effects .

The Definition of Harassment

Another troubling development related to sound appears in the defense departments proposals to amend the Marine Mammal Protection Act. Among these is a change in the definition of so-called “level A” and “level B” harassment. The changes are alarming and have great bearing on the issue of proliferation of sound in the oceans.

For example: level “B” harassment was formerly defined as activities that disrupted behavioral patterns including migration, breathing, nursing, breeding, feeding and sheltering. The proposed change would prohibit activities that disrupted these behavioral patterns ONLY if the disruption occurred “to the point where such behavioral patterns are abandoned or significantly altered”. This change would make permitting easier, because it places the burden of proof on the animals to show gross disruption in behavior before we can prohibit intrusions into their habitat. We should not suborn sound being broadcast at high intensity and over broad areas simply because marine mammals do not respond by actually abandoning their feeding, breeding and sheltering. Gross degradation of habitat can occur with little noticeable behavioral changes in the inhabitants.

Demonstrating the results of long-term exposure or synergistic effects of multiple sources of loud sounds is likely to be difficult at best. We know from experience with humans that they will continue to go to work each day in factories with unhealthy levels of noise that, over time, will cause gross hearing impairment. They do not abandon their work in this “habitat” simply because it is unhealthy for them. The annoyance or pain seems tolerable when compared with the importance of earning a living. Deafness occurs gradually and when it is finally severe enough to impair the worker, it is irreversible. We do not allow this sort of damage to occur to members of our own species, with whose plight we can empathize. Nor should we countenance it in the ocean environment where deafness that occurs over years may result in reduced viability of individuals and consequent irrecoverable species-wide impacts.

The use of sound is a far more subtle and arcane a threat to marine animals than entanglement in fishing gear or directed hunting. I would like to make a comparison. We know little about the threshold levels at which specific damage will occur from the uptake of toxic, carcinogenic or mutagenic chemicals, whose effects may take years to appear, nor do we understand tolerance or synergistic properties. Similarly the effects of sound in the ocean may either be acute or chronic but in either case may result in irreversible damage or habitat degradation. Just as we assess discharge limits for chemicals and look at effects of prolonged or repeated exposure and synergistic effects, we must approach sound and its effects similarly. Far too few EIS’s are conducted. Far too little research is funded. And far too many projects proceed with minimal or no oversight.

Coastal Pollutants

Pollutants have been linked with adverse effects on the marine environment. Bioaccumulation

of contaminants can lead to health effects on individuals that may reach population level effects. Pollution from aquaculture sites has been linked to proliferation of harmful algal blooms in the area. Acute toxicity can cause death. But not all effects of pollution are immediate.

While much has been written about the effects of contaminants on mammalian reproduction, little is known about dose-response effects such that we can fully understand what levels constitute high-risk levels of exposure. Seals and sea lions have suffered reduced reproduction rates, reproductive tract pathologies and complete reproductive failure as a result of toxic contaminants (Reeves et al. 2000). The International Whaling Commission's Scientific Committee concluded that sufficient data were available on the adverse effects of pollutants on terrestrial species and non-cetacean marine mammals to warrant concern for cetaceans (Reijnders et al 1999). Bottlenose dolphins and many other coastal species along the east coast live in areas of heavy coastal development and may be exposed to harmful levels of contaminants.

Recent research has focused on whether chemical contaminants may play a role in the suppression of reproduction in North Atlantic Right whales. While their counterparts in the southern hemisphere may reach sexual maturity at a comparable age, the rate of population increase is significantly lower in North Atlantic right whales than those of several Southern Hemisphere right whale populations, inter-birth intervals are increasing. A workshop held by the NMFS in November 2001 concluded that: "right whales are routinely exposed to a wide array of xenobiotic chemicals, some of which generate toxic effects on mammalian reproductive and immune systems. Thus, even though most of the fat-soluble persistent compounds...seem to occur at relatively low levels in right whale tissues, chemical contamination may be partly responsible for the observed reproductive problems in the stock."(Reeves et al, 2000)

Chemical contaminants are an insidious threat that requires vigilance and continued support of rigorous legislative restriction on the output of pollutants into our rivers and coastal waterways.

Ecotourism and Directed Interactions

Since 1977, a multi-million whale watching industry has grown up in New England. People from all nations, including whaling nations, regularly board whale watching trips which are narrated by naturalists who can provide them with information on whale behavior, biology and conservation concerns; as well as information on other marine animals sighted in the Gulf of Maine. In addition, researchers who work aboard some of the commercial whale watch boats have been provided with an opportunistic platform to collect individual identification photographs as well as demographic and distributional data that have contributed immeasurably to our understanding of the biology and behavior of humpback whales in particular, but right whales, finback whales and other species as well. Many times more papers have been published in scientific journals as a result of data collected aboard whale watching boats than have resulted from data gathered aboard commercial whaling ships that ostensibly conduct "research whaling." Whale watch boats have helped establish the fact many of the questions about whale biology and distribution can be answered in a non-consumptive manner.

While this would seem to be a boon to whales, it is a mixed blessing. While there is a greater opportunity for public education about the marine environment, there is also a greater potential to harass whales to an extent that may disrupt normal daily activities of foraging, resting and nursing.

To that end, the NMFS has published guidelines for whale watching in the Gulf of Maine. These guidelines specify such things as vessel speed and approach distances for whales. They are, however, voluntary and not enforceable. Indeed, several humpbacks have been hit by whale watching boats, including one animal named “Zenith” who was injured in 1998 and has not been seen since that time. A minke whale was killed in a collision with a different whale watching boat in the same year. At least one harbor seal has been sucked into the jet intake and killed by a high speed catamaran whale watching boat.

Displays in marine aquariums and zoos have also helped whet the public’s appetite for swimming with and feeding marine mammals in the wild. Although these efforts may pose a risk to the people holding out food or holding onto an animal’s dorsal fin, it also risks the animal itself. Dolphins have learned to approach boats for food preferentially to wild foraging. Not only are they at risk from being hit by a vessel, but this also leads to a “garbage pail bear” effect that is very unhealthy. I myself have observed the public trying to feed dolphins snack food such as potato chips. Fishermen on the Coastal Bottlenose Dolphin Take Reduction Team believe that they sometimes catch these dolphins as they haul nets and dolphins approach the boat attempting to get food. The NMFS has undertaken a public education effort to halt the feeding of dolphins, but commercial tour boat operators in the Gulf of Mexico have routinely flouted the prohibition. The lesson we should have learned from countless situations (such as speed limits on highways) is that strict and public enforcement efforts are needed to compliment the efforts at education.

One lesson that has NOT been learned from past experience is that self-regulating and self-reporting by an industry are rarely sufficient to effect significant changes. For example, newly released data from the former Soviet Union demonstrate that, even though a moratorium was put in place on killing humpback and right whales, nations continued to kill them up through the 1970's because there was no mechanism for enforcement (Clapham et al 1999).

The NMFS is aware of numerous collisions with whale watching vessels that have resulted in injury of endangered whale species, yet has not acted to institute enforceable regulations nor has it undertaken a consultation under Section 7 of the Endangered Species Act to assess risk to endangered species from public and private whale watching activities. It has also failed to issue incidental take permits as required under the MMPA for activities that are known to result in adverse impacts to marine mammals. The NMFS must act to uphold its responsibilities under both the ESA and the MMPA.

Killing of Nuisance Animals

Prior to 1994 fishermen were allowed to kill marine mammals to “protect gear and catch.” The 1994 Amendments to the MMPA outlawed this practice but provided a process by which a multi-stakeholder group can be convened to assess impacts of depredating seals and sea lions on

endangered salmonids. After its review the task force may approve lethal removal of specifically identified individual animals. This was an attempt to address a situation in the Pacific northwest coast in which seals and sea lions were eating migrating salmon and were thought to be further endangering these already declining fish stocks. The HSUS served on a task force convened to address just such a situation in the Ballard Locks in Washington State. Several animals were captured and removed but, because of public outcry, were not killed. More recent research on predator-prey interactions in the Pacific Northwest has indicated that the level of predation is not as high as was previously presumed. No further task forces have been convened since 1995.

A different situation exists with regard to finfish aquaculture in which seals or sea lions bite fish through the netting of the pens, or attempt to enter the pen. In the Gulf of Maine, operators of finfish aquaculture sites in Maine, regularly shot seals in the vicinity of their fish pens prior to 1994. It was estimated by the industry that several hundred seals were killed annually. Although Congress revoked their ability to legally kill seals, it mandated a “Gulf of Maine Aquaculture-Pinniped Interaction Task Force” that was convened in 1996 (60 CFR 6036). Acknowledging the need to provide involvement by stakeholders, this was a multi-stakeholder panel comprised of representatives of aquaculture growers, scientists, state and federal managers and conservation groups. The HSUS served on this Task Force as well. The Task Force was charged with assessing the interactions and recommending means of dealing with them. The final report, issued in February 1996, financial losses, available non-lethal deterrents and lethal options were reviewed. The Task Force agreed on three criteria that need to be met to justify lethal removal of individual seals:

- 1) The consequences of the depredation must be severe and demonstrable.
- 2) Lethal measures under consideration must be verified as an effective means of solving the predation problem.
- 3) No non-lethal alternatives are available.

Members of the Task Force did not agree that the three criteria were met by the current industry and predation situation. (NMFS 1996) Because there is a current effort underway in NMFS to promote the development of aquaculture as an alternative to wild capture fisheries, there will also be an increased potential for pinnipeds, and in some circumstances dolphins and whales, to visit pen sites as a source of food. This may lead to increased calls to resume intentional killing of marine mammals, despite the fact aquaculture sites have insurance to compensate for most losses and most losses appear to be typical of levels of predator losses seen in other agricultural commodities (NMFS 1996; Wiwialowski, 1994)

When we construct such finfish facilities in the middle of seal haul out areas, it is hardly surprising that seals and sea lions take advantage of this apparent food resource. We need to learn from the experience of sites already in existence, that many issues must be considered when proposing new sites. For example, it should be incumbent upon growers to consider siting issues, husbandry practices and predator deterrents prior to establishing a new site and to include detailed planning and alternatives when seeking permits. Furthermore, the NMFS must issue guidelines for use of non-lethal deterrents that have not been published despite the 1994 mandate for their development. Additional funding should also be made available to support research into the use of anti-predator netting and other physical means of preventing predation.

Other Concerns

Naval Live Fire Activities

The U.S. Navy regularly conducts live fire bombing and ordnance practice off the U.S. east coast. These sorts of activities may be necessary for national defense readiness, however it is important that prior to their conduct, the Navy consult with the NMFS to identify the times and areas least likely to pose a risk to whales.

In January through May of 1996, five right whales were found dead in the vicinity of, and immediately following, several live-fire exercises that were conducted just outside of their critical habitat in the Southeast U.S. Not all of the carcasses were recovered for necropsy, but at least one of the carcasses that was recovered showed evidence of barotrauma (a severe damage caused by rapid pressure change generally brought about by a nearby explosion) that led to its death. This amounted to almost 2% of this critically endangered population dying coincident with Naval activities. The NMFS had been unaware of these exercises until the deaths of right whales were noted. Subsequent to the publicity surrounding the deaths, the Navy did consult with the NMFS and moved its firing ranges further to the east. No additional suspicious deaths have been noted in that area since then.

No lesson about consultation appears to have been learned from this experience. More recently, in June of this year, the HSUS discovered that the US Navy has been conducting live fire exercises in the Gulf of Maine in the middle of prime feeding areas for endangered whales and only about 60 miles from right whale critical habitat. This was discovered only because NMFS aerial survey planes, looking for right whales offshore, were asked to avoid the area. Several weeks thereafter, the badly decomposed carcass of a headless right whale calf was found just outside of critical habitat. Because of the advanced state of decomposition, the cause of death will never be determined but the US Navy admitted dropping live bombs just to the north of where the carcass was found. The bombing area, near an oceanographic feature called Sharrer's Ridge, is in Wilkinson Basin which is a known seasonal feeding area for humpback and finback whales, and it is also regularly transited in the spring and early summer by right whales as they move north toward summering grounds in the Bay of Fundy.

Once again, the conduct of these exercises was only discovered incidentally, rather than as a result of informed discussion. Naval jets which may look for whales prior to exercises are unlikely to see whales that are difficult to spot even from low-flying survey planes with trained observers on board. Sonabuys, dropped to listen for vocalizations are ineffective, and reliance on the NMFS right whale reporting system (outline above under ship strikes) is wholly inadequate. Though it is understandable that the Navy may not wish to publicize the time or area where its exercises will occur, advance consultation with NMFS can help identify a number of optional areas and/or times that might be used and which provide a reduced likelihood of harm to whales. Similar consultations should occur in the mid-Atlantic, especially near Norfolk Naval Base, where exercises are also routinely conducted in a heavily used seasonal migratory area for a number of endangered whale species, and resident dolphins. It is important for the Navy to institute cooperative dialog with NMFS before another tragedy ensues.

Industrial Development of the Continental Shelf

As previously mentioned in the section on noise in the ocean, risks from oil and gas exploration and production are already known in the Gulf of Mexico and on the west coast. Previous administrations have placed a temporary moratorium on exploration in the George's Bank area, which is essential fish habitat, a seasonal high use area for right whales and is used at least 8 months of the year by other endangered species. Further pressure to develop domestic energy resources may make this area vulnerable in the future—much as the pristine Arctic National Wildlife Refuge is under pressure for oil and gas development. Protecting this area on a permanent basis from the various risks posed by offshore exploration and exploitation of oil and gas should be a high priority.

Other industrial development of the continental shelf has been proposed. For example, the Army Corps of Engineers is prepared to issue a permit for construction of a wind-farm on 28 square miles of Nantucket Shoals, which would contain 170 turbines, each taller than the statue of liberty. Nantucket Shoals has been declared essential fish habitat for spawning ground fish, it is in the middle of a migratory bird corridor that sees the passage of millions of birds annually and it is also a federally designated Marine Protected Area. While virtually all environmental organizations support alternative energy projects, it is important that they be sited appropriately. Many local and national environmental groups have expressed concern about this particular project, not only because potential impacts on wildlife utilizing Nantucket Shoals but also regarding the basis under which the Corps of Engineers is prepared to act.

Citing their authority under Section 10 of the Rivers and Harbors Act, which is intended to allow the Army Corps to assess potential hazards to navigation, the Corps believes that it has permitting authority. If it is allowed to proceed under this basis, this windfarm will represent the first for-profit use of a public resource and public lands without competitive bidding and without a leasing process or leasing fees such as is required of offshore oil and gas exploration. This means that the entire coastline of the US outside of the 3 mile limit of state waters, would be vulnerable to exploitation by any corporation wishing to install fixed structures, provided that they do not involve oil and gas exploration. Open ocean aquaculture pens, anchored casinos, additional windfarms, and other structures could proliferate with little public process and potential for gross habitat disruption. It is critical that we learn from bitter lessons of the past that have occurred in terrestrial settings that the time to determine the best use of any area is before it is developed rather than after development begins.

Senator Ted Kennedy has introduced a proposal that would require offshore use of public lands to be overseen by the Interior Department, which is charged with protecting public resources, rather than the Army Corps of Engineers which is largely concerned with structural integrity and hazards to navigation. We generally support this proposal and hope that this Commission or some other body can take a lead in providing a forum for discussing the appropriate uses of various ocean areas prior to their development or attempts to harness their resources for private gain.

Summary

The preceding list of hazards to marine mammals and their habitats can be illustrated by a single species which has been mentioned off and on throughout my discussion—the North Atlantic Right Whale. As one of the most critically endangered of whale species, they provide an extreme case.

Populations of right whales in the North Atlantic declined from the tens of thousands to a population that is estimated today at around 300 individuals. Whalers exploited them wherever they found them. Once they became economically extinct, they were protected both internationally and domestically. Far from seeing a recovery as impressive as that of the gray whales on the west coast, the population has declined during the past decade and at its current rate of decline will be extinct in less than 200 years. They decline, not as a result of directed exploitation, but as a result of activities that kill them unintentionally. The slow moving, coastal nature of the species that once made them vulnerable to whaling has now made them vulnerable to huge, fast-moving ships that ply our coasts. Mothers and calves, who migrate closer to shore are the most vulnerable and suffer disproportionate mortality. Coastal fishing for lobsters, crabs and ground fish also entangles and kills right whales. Their coastal nature makes them vulnerable to uptake of pollutants that may affect their reproductive capacity. They are in or near areas where recreational boaters wish to see them or which the US Navy wishes to use for live fire exercises. Increasing noise in the oceans may interfere with their low frequency communications and proposals for extremely loud alarms to prevent ship collisions also risk driving them away from key foraging habitats.

Saving the species is not as simple as stopping commercial whaling—we cannot simply halt commercial shipping and commercial fishing; coastal development is still proceeding rapidly; and the US Navy needs areas in which to conduct exercises. Finding a solution is as complex as the problem itself. Largely as a result of lawsuits that have forced it to uphold its statutory responsibilities, the National Marine Fisheries Service (NMFS) began to address some of these problems approximately 5 years ago by restricting or modifying commercial fishing gear. Nevertheless over 60 percent of right whales bear scars of past entanglements and as of the date that this was written at least 3 entangled right whales are swimming off our coast. Little if anything has been done in the US to restrict shipping activities and the US Navy is still reluctant to consult with the NMFS on impacts of its activities. When you add human impacts to the normal fluctuations in their prey base which would have been of little consequence to a large population—you get a devastating effect on a small population. A population that is still in decline.

While the situation for other marine mammals may not seem as dire. Declining populations of Hawaiian monk seals and marine mammals in Alaska testify to the fact that we must question our stewardship. So how do we conserve our marine resources? I would like to offer some advice from a paper published in 1993, that reviewed terrestrial exploitation and conservation efforts (Ludwig, et al 1993). The authors offer guidance that we need to consider as we look to conserve marine resources.

1) Include human motivation and response as part of the system to be managed. Shortsightedness and greed underlie difficulties in management of resources although these

difficulties may manifest themselves as biological problems of the stock.

2) Act before scientific consensus is achieved. We do not require additional scientific studies to tell us that human activities are affecting ecosystems. Calls for more research may simply be delaying tactics.

3) Rely on scientists to recognize problems, but not to remedy them. The judgement of scientists is often influenced by their training in their discipline, but most important issues involving resources and the environment involve interactions whose understanding must involve many disciplines. Scientific judgement is also subject to political and economic pressure.

4) Distrust claims of sustainability. Past resource exploitation has seldom been sustainable, so any new plan that involves claims of sustainability should be suspect. Claims of sustainability in the face of burgeoning populations and development may lead to false complacency. We then spend more money on basic ecological research rather than in addressing the problems of unfettered growth.

5) Confront uncertainty. Once we free ourselves of the illusion that lavishly funded science or technology can provide an easy solution to any resource or conservation problem, appropriate action becomes possible. Effective policies are possible under conditions of uncertainty, but they must take uncertainty into account. We must consider a variety of plausible hypotheses about the world; consider a variety of possible strategies; favor actions that are robust to uncertainty; hedge; favor actions that are informative; probe and experiment; monitor results; update assessments and modify policy accordingly; and favor actions that are reversible.

We have learned from past overexploitation of marine mammal populations that they are often fragile and they may not recover quickly. We have learned that it is important to invest both the public and user groups in decision making and evaluation processes as we look for solutions. We have learned that science does not have all the answers. And we must be mindful that the American public still treasures the vast, wild expanses of the ocean and feels protective about many of its many inhabitants. With all that in mind, we must look toward a future where precautionary and proactive management replaces retrospective regret.

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