REPORT TO CONGRESS

IMPACTS OF CALIFORNIA SEA LIONS AND PACIFIC HARBOR SEALS ON SALMONIDS AND WEST COAST ECOSYSTEMS

Prepared by

U.S. Department of Commerce
National Oceanic and Atmospheric Administration
National Marine Fisheries Service

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INTRODUCTION

In accordance with Section 120(f) of the Marine Mammal Protection Act (MMPA), this report follows the scientific investigation conducted by the National Marine Fisheries Service (NMFS) into the impacts of California sea lion and Pacific harbor seal predation on salmonids and other impacts of these pinnipeds on the coastal ecosystems of Washington, Oregon, and California (Scientific Investigation Report (NMFS 1997)). This report provides the results of discussions between NMFS and the Pacific States Marine Fisheries Commission (PSMFC) and representatives of the Washington Department of Fish and Wildlife (WDFW), Oregon Department of Fish and Wildlife (ODFW) and California Department of Fish and Game (CDFG). The discussions were held to (1) address the issues and problems identified as a result of the scientific investigation, and (2) develop recommendations to address such issues or problems. The Scientific Investigation Report was released to the public in March 1997. The draft recommendations based on these discussions were made available to the public for review and comment for a period of 90 days. The recommendations are hereby submitted to the House of Representatives Committee on Resources and to the Senate Committee on Commerce, Science, and Transportation in accordance with P.L. 103-238 - Marine Mammal Protection Act Amendments of 1994.

Two pinniped issues were identified from the Scientific Investigation Report. These issues, along with a summary of the information from the scientific investigation are provided in the pinniped issues section of this report. Four recommendations were developed by the PSMFC, the state resource agencies in Washington, Oregon, and California (the States), and NMFS. The issue of greatest concern is the potential impact of pinnipeds on the recovery of salmonids that are listed, proposed for listing, or candidates for listing under the Endangered Species Act (ESA). NMFS, PSMFC, and the States acknowledge that there are a suite of factors that have caused the decline of salmonids on the West Coast. Although predation by pinnipeds was not a principal factor in the listing or proposed listing under the ESA of any salmonid populations, it is now a factor that may affect recovery of depressed salmonid populations, and it is the specific factor that Congress requested be the focus of this report. The problems created by expanding pinniped populations, the need for management options, and the rationale for specific recommendations are provided in the discussion section of this report. Several specific management actions are included in the recommendations section of this report. The appendix of this report contains a summary of public comments on the draft recommendations and NMFS' responses to these comments.

PINNIPED ISSUES

California sea lion and Pacific harbor seal issues identified in the Scientific Investigation Report are: (1) the impacts of pinniped predation on salmonids, and (2) the impacts of pinnipeds on West Coast ecosystems. Impacts on ecosystems are separated into two components: impacts on human activities, and impacts on other components of the ecosystems. This separation reflects the interpretation that the major ecosystem conflict with increasing pinniped populations (other than conflicts with depressed salmonid populations) is socioeconomic and is related to pinniped

interference with human activities or competition with humans for marine resources. The background information for each issue is derived from the Scientific Investigation Report. Citations and references for the specific information from the Scientific Investigation Report are not repeated in this report.

1. Pinniped Impacts on Salmonids

Issue: California sea lion and Pacific harbor seal populations on the West Coast are increasing while many salmonid populations are decreasing. Salmonid populations that are depressed and declining, especially those that are listed, proposed to be listed, or candidates for listing under the ESA, can be negatively impacted by expanding pinniped populations and attendant predation.

Status of Pinnipeds and Salmonids

The scientific information clearly indicates that West Coast populations of California sea lions and Pacific harbor seals are healthy and robust, and have increased at average annual rates of five to eight percent per year since the passage of the MMPA in 1972. The current populations of California sea lions and Pacific harbor seals may be larger than at any other time in the past several centuries, and their ranges and areas of common occurrence have expanded. California sea lions, for example, are now found in increasing numbers in northern waters, in inland waters, and upriver in freshwater in many West Coast river systems. They are also now found near man-made structures such as dams or fish passage facilities with increasing frequency. Their use of docks, piers, and other man-made structures as haul-out sites has increased as well. In California, the number of areas used by harbor seals as haul-out sites has doubled since 1982. The increased abundance and expanded distribution of both pinniped populations has resulted in more frequent contact with humans and increased interactions with human activities such as fishing. The presence of large numbers of pinnipeds in estuaries during salmonid migrations raises concerns for local impacts of pinniped predation on depressed salmonid populations. Despite their current high abundance levels, the Scientific Investigation Report (NMFS 1997) did not find conclusive evidence that either of these marine mammal populations had reached its optimum sustainable population (OSP) level. Preliminary analyses of more recent survey data on the coastal harbor seal populations of Washington and Oregon indicates that they may be at OSP; further analysis and preparation of manuscripts for peer review are currently underway. Unless the pinniped populations are demonstrated to be within their OSP level, management actions, such as a waiver of the MMPA moratorium on taking marine mammals or transfer of management authority to the states for the effective resolution of many pinniped-fishery resource conflicts, cannot be taken under the MMPA.

While pinniped populations have increased, many marine and anadromous fish populations have declined. Many salmonid populations have decreased to levels resulting in ESA listing, or proposals for listing as threatened and endangered species. As of January 1999, fifteen populations of Pacific salmonids have been listed under the ESA, and NMFS is considering listing additional populations

of coho salmon, chinook salmon, chum salmon, sockeye salmon, steelhead and cutthroat trout. These and other salmonid populations also have been identified as critical or of special concern by state resource management agencies.

Pinniped Food Habits Information

The food habits of pinnipeds have been a subject of scientific interest for many years, primarily because these animals have long been viewed as competitors with humans for a variety of fish species. Research has shown that California sea lions and Pacific harbor seals are opportunistic feeders, with diets consisting primarily of prey that are seasonally and locally abundant. Such studies indicate that these pinnipeds frequently consume salmonids when they are available.

Most pinniped food habit studies were not designed to determine the impact that pinniped predation may have on a specific salmonid population. The majority of studies of pinniped foraging on salmon were conducted on an opportunistic basis, as pinnipeds became available for examination or as other food habit samples were collected for analysis. Each study is subject to its own biases, making quantification of the salmonid contribution to pinniped diets difficult. Identification of prey hard parts from fecal samples can be biased by variations in ingestion and digestion of identifiable parts of different prey. Most older studies relied primarily on the recovery and identification of fish otoliths (ear bones) for prey identification, while most current studies use many other prey hard parts such as vertebrae, gill rakers, skull bones, teeth, and other mouth parts. Reanalysis of material from past studies using these new techniques often shows an increase in the occurrence of salmonids in the diet of pinnipeds. Direct observations of pinnipeds catching and consuming fish at the surface are usually biased toward larger prey species (e.g., salmonids) that are torn apart and consumed at the surface. Nonetheless, surface observations can provide data for estimates of removals by pinnipeds of migrating adult salmonids from specific populations in site-specific situations. Lastly, direct lethal collection of pinnipeds for examination of gastrointestinal tracts provides an effective means to quantify prey consumption rates. Examination of freshly killed pinnipeds that were actively foraging or had recently fed allows a direct assessment of species consumed, by number, weight, and volume. Such data from direct lethal takes are also critical to developing accurate quantitative estimates of various prey species consumed and to validate estimates generated from examination of fecal samples. However, the MMPA prohibits the issuance of research permits that allow marine mammals to be killed unless the applicant demonstrates that a non-lethal method of conducting the research is not feasible. Because the feasibility of alternative methods is usually subject to intense debate, no research permit applications for lethal takes for food habits studies have been pursued in recent years on the West Coast.

Salmonid consumption by pinnipeds differs from one geographic area to another in response to changes in oceanic conditions, salmonid run strength, abundance levels of other desirable prey species, changes in local predator abundance (daily, seasonal and year-to-year), prey vulnerability, and other factors. In addition, the techniques currently available to identify prey hard parts cannot always be used to identify salmonid parts to the species level (e.g., identifying steelhead versus

cutthroat trout). For these reasons, attempts to estimate the contribution of salmonids to the overall diet of pinnipeds by expanding the results of the few site-specific studies to larger geographic areas or time periods are not likely to result in statistically valid or useful estimates.

Pinniped Predation on Salmonids

A number of factors have caused the decline of salmonid populations, and many of those are still affecting salmonid recovery on the West Coast. Although pinniped predation also is a factor affecting the recovery of some salmonid populations, there have been no specific studies that demonstrate a cause-effect relationship between increases in pinniped numbers and declines in salmonid populations, and no such direct relationship is implied here. Rather than an issue due strictly to pinniped population size, the impact on salmonids is likely due to opportunistic behavior by certain individual pinnipeds that have learned to exploit situations where salmonids are concentrated and particularly vulnerable. As the number of pinnipeds increases, the likelihood of more pinnipeds discovering these situations increases, as does the opportunity to pass on such learned behavior to other pinnipeds.

Pinniped predation on small salmonid populations, especially at areas of restricted fish passage, can have negative impacts on the recovery of depressed salmonids. Seasonal predation by pinnipeds on some salmonid populations has been observed, and a significant negative impact on one salmonid population has been documented (i.e., winter steelhead migrating through the Ballard Locks at Seattle, WA). The Pacific Scientific Review Group, established under the 1994 Amendments to the MMPA as a scientific advisory body to NMFS, identified the impact of pinniped predation on the decline or recovery of certain salmonid populations as a major issue for management of pinniped interactions with various fisheries and fish stocks.

Pinniped predation on free-swimming salmonids in open water occurs, but successful predation is more likely in nearshore areas and in rivers where salmonids are concentrated. Of particular concern are areas in bays and rivers where adult fish passage is impeded by natural or artificial barriers, such as river restrictions, falls, fish ladders, dams, and other barriers. Outmigrating salmonid smolts are also preyed upon by pinnipeds in these areas. In some areas, these conflicts are seasonal. Although harbor seals are year-round residents in all coastal waters, the number of California sea lions increases seasonally in northern waters as juveniles and adult males migrate north after the breeding season in late-summer and fall. The process is reversed on the southern migration to the breeding rookery areas in spring and early summer. Reports of the most severe conflicts between pinnipeds and salmonid populations in northern areas often coincide with the California sea lion migration.

Although pinniped presence and foraging can affect salmonid passage in estuaries and riverine areas in Washington, Oregon, and California, most of the sites of pinniped and salmonid co-occurrence have yet to be studied in detail. Due to ongoing budget limitations in resource agencies, only the most visible of these situations have been studied or managed in some fashion. The most familiar example of pinniped impacts on salmonid passage and spawning escapement involves California sea

lion predation on winter steelhead at the Ballard Locks in Seattle, WA. This situation has been well documented since the mid-1980s and authority to lethally remove sea lions was provided by NMFS to WDFW under MMPA Section 120 in 1995. It has been necessary to invest a considerable amount of time, effort, and resources, however, in attempting to resolve impacts of California sea lions on salmonid passage and escapement at this one location. During this time, the affected steelhead population has been reduced to remnant levels. WDFW characterized the lethal authorization process as cumbersome and restrictive and found that the provisions of Section 120 of the MMPA have not provided an efficient or effective system for dealing with pinniped problems of this critical nature.

In recent years, a new conflict between California sea lions and salmonids that is similar to the Ballard Locks situation has developed 128 miles upriver from the Pacific Ocean at a fish passage facility at Willamette Falls in Oregon City, OR. Since 1990, at least one to three California sea lions have been observed foraging on salmonids seasonally in freshwater near the fish passage facility at the Falls. ODFW began monitoring this conflict in 1995 and found four to six sea lions were foraging at this site from February through May, where the sea lions consumed steelhead and spring chinook salmon in the area below the falls. ODFW conducted some initial testing with non-lethal deterrents without success in 1996. Based on the experience with sea lions at the Ballard Locks, resource managers predict that this situation is likely to worsen, with increasing numbers of sea lions and increased predation on salmonids at this site in coming years. Willamette River winter steelhead and spring chinook salmon numbers have declined in recent years, and unabated pinniped foraging at this critical fish passage site is unacceptable to ODFW.

A number of other locations where pinnipeds also may be affecting salmonids and potentially inhibiting fish passage are identified in the Scientific Investigation Report. Indirect evidence of pinniped predation also is available from federal and state hatcheries in Washington and Oregon, and from private hatchery facilities in California, where returning salmonids show a high incidence of scarring caused by pinniped predation attempts. These data indicate that pinnipeds are present at many sites where salmonids are vulnerable to predation.

Currently, to obtain authority for lethal removal of pinnipeds at sites with salmonid conflicts, a state is required under Section 120 of the MMPA to demonstrate that individual pinnipeds are having a significant negative impact on salmonid populations that are listed or proposed for listing under the ESA. Quantification of the impacts to the extent required in the MMPA would mean collecting new, extensive and highly detailed information specific to each site. In some cases, the salmonid populations may not yet be depressed to near the threatened or endangered level required under Section 120 of the MMPA. In others, the cost of conducting the level of detailed investigation necessary to meet the requirements of Section 120 at each site would be prohibitive. Current food habit collection and analysis techniques may also be inadequate to precisely determine and quantify pinniped impacts on salmonids of concern. While time and resources are expended attempting to fully assess the effects of predation, depressed salmonid populations at some sites could continue to decline due to pinnipeds, even if other sources of mortality may have been curtailed.

2. Pinniped Impacts on West Coast Ecosystems

Issue: Increasing California sea lion and Pacific harbor seal populations and their expanding distribution are negatively impacting commercial and recreational fishing, damaging private property, and posing public safety threats.

Impacts on Fisheries and Other Human Activities

Increasing pinniped populations have several direct impacts on human activities such as fishing. Commercial and recreational fishing are important social and economic assets in Washington, Oregon, and California. In many situations, California sea lions and Pacific harbor seals are causing economic impacts of undetermined magnitude on both commercial and recreational fishing industries in these states. In the commercial fisheries, California sea lions and Pacific harbor seals depredate catch and damage gear in the salmon troll and gillnet fisheries; near-shore gillnet fisheries; herring, squid, and bait purse seine and round-haul fisheries; and trap and live bait fisheries. Commercial fishers lose income because they are unable to catch, land, and sell fish. Reductions in commercial landings result in economic loss to coastal communities, and reverberate through related industries such as dock facilities, fuel docks, wholesale and retail fish markets, restaurants and the trucking industry. State agencies responsible for managing commercial fisheries lose revenue due to fewer commercial landings. This reduces funds available for monitoring, research and management of marine resources.

Commercial salmon net-pen facilities, live-bait, hatchery, enhancement and fish farming operations also are affected by both California sea lions and Pacific harbor seals. Pinnipeds break into containments; bite, injure, kill, and consume fish; and damage facility and containment structures. Shellfish harvesting sites have been closed in one area because of high concentrations of fecal coliform bacteria from large numbers of pinnipeds on nearby haul-outs.

Both California sea lions and Pacific harbor seals are involved in interactions with recreational fisheries coastwide. In California, for example, charterboat skippers report that they are losing their customers because of continual interactions with California sea lions. Sea lions interact by consuming bait and chum, and depredating fish that have been caught and are being reeled in. Fish may stop feeding or may be scared away by the presence of sea lions. In addition, when sea lions are present, skippers frequently have to move their boats to other, sometimes less productive, fishing areas, incurring additional fuel costs and loss of fishing time. Despite these efforts, sea lions often follow the boats to these new locations. Similar problems also are experienced with harbor seals coastwide.

Predation by pinnipeds in recreational and commercial salmon fisheries reduces the accuracy of fishing mortality estimates. When California sea lions or Pacific harbor seals remove a fish from a line (hook) or net, fishing mortality is effectively increased. Commercial fishers (operating under a quota or harvest guideline) and recreational anglers normally will continue fishing to replace those

depredated fish. Although management agencies account for fishery harvests and escapement, removals by pinnipeds are poorly documented and usually are considered in the general category of natural mortality. The rates of removal by pinnipeds are largely unpredictable, and will often vary depending on the season or year during which the fishery takes place. In addition, current estimates of natural mortality were developed from earlier years when there were fewer pinnipeds, and when fishers were able to use lethal deterrence to protect their catch. The full extent of current pinniped depredation is unknown, but has likely increased with expanding pinniped populations and less effective deterrence alternatives. This means that in some cases, current expectations for natural mortality may be low, increasing chances for management error and possibly allowing levels of harvest that are too high.

There are human health, safety, and property issues associated with the increasing pinniped populations as well. Increasing numbers of California sea lions are hauling-out on docks, piers, private boats, and other man-made structures. Their weight can damage structures while their fecal wastes foul the site. At some sites, California sea lions routinely haul-out on docks and react aggressively toward people who approach. Boat owners have been prevented from accessing their vessels. Coastwide, there are reports of California sea lions climbing into boats, stealing fish laid out on docks, intimidating people at marinas, and biting through landing nets in attempts to take fish. Human injury has resulted from some of these confrontations. Although many of these situations may be viewed as "normal" wildlife problems, state resource agencies often are unable to deal with pinnipeds as they would other wildlife species due to restrictions in the MMPA.

The 1994 Amendments to the MMPA granted new authority for private boat and dock owners to deter marine mammals, provided the method does not seriously injure or kill or have a significant adverse effect on marine mammals. The Amendments also imposed a new prohibition on the intentional lethal take of pinnipeds by commercial fishers to protect gear and catch. Prior to the 1994 Amendments, MMPA regulations allowed commercial fishers to use lethal methods to protect catch and gear if non-lethal steps had proven ineffective. Currently, no safe, effective deterrent devices or techniques that provide long-term resolution have been identified to prevent pinnipeds from interfering with commercial and recreational fishing or to keep them away from aquaculture, live-bait, hatchery, and fish farming operations.

Many devices and non-lethal techniques have been tested at the Ballard Locks, but none has been totally successful because some California sea lions eventually "learned" to tolerate or avoid the effects of all of them. Those sea lions that were unaffected by the non-lethal efforts were responsible for much of the resulting predation on steelhead at the Ballard Locks. Similar testing of non-lethal deterrence techniques on Pacific harbor seals and California sea lions in other areas and situations also has shown them to be of limited effectiveness. PSMFC and the States believe that NMFS research on pinniped deterrence and on the effects of expanding pinniped populations on coastal ecosystems has been inadequate. However, they acknowledge that NMFS has had to focus marine mammal research on stock assessments because Sections 117 and 118 of the MMPA require current

population size estimates for all marine mammal populations and estimates of fishing mortality in order to manage the incidental taking of marine mammals during commercial fishing operations.

Impacts on the Marine Ecosystem

At this time, there is insufficient information available to evaluate whether foraging by pinnipeds may be affecting the abundance of human-exploited marine species other than salmon, and/or the abundance of fish that are the prey of salmonids. Food habits studies on California sea lions and Pacific harbor seals indicate a broad range of prey species are consumed. Because pinnipeds are opportunistic predators, food habits change dramatically over areas, seasons, and years in response to changes in abundance of different species in the prey assemblage. Thus, determining impacts of these predators on fishery stocks and the coastal ecosystem requires specific knowledge about a variety of subjects, including (1) feeding behavior; (2) prey selection and consumption rates; (3) population dynamics of predator and prey; and, (4) the variability in abundance of both pinnipeds and their prey over time and space. The ecological interactions between pinnipeds and fishery resources are complex and are further complicated because some pinniped prey species are also the predominant prey of small cetaceans, sea birds, fish, and squid.

It also is difficult to determine ecosystem level impacts due to the overall limited understanding of ecosystem functions. For example, it is unclear whether prey abundance or availability causes the predator to switch prey species, or whether they change prey in response to changes in the energy content of prey over the season. To estimate the impacts of pinniped predation on commercial fish stocks, food habits information should be collected during the fishing season concurrently with assessments of prey availability and prey quality. There are both methodological and conceptual difficulties in estimating impacts of marine mammal predation on prey stocks. To estimate the quantity consumed would require more knowledge of the population dynamics and behavior of predator/prey species than is currently available. Ecological models to quantify the effects need to be developed. Research on West Coast ecosystems could provide information to evaluate whether increasing pinniped populations can be expected to consume more from fisheries stocks which are currently managed to optimize economic yield.

DISCUSSION

NMFS is given responsibility to regulate the use of living marine resources under a number of statutes, such as the ESA, MMPA, and the Magnuson-Stevens Fishery Conservation and Management Act. Each of these statutes contains provisions to govern the conservation and utilization of one or more living marine resource. Because there is no clear legislative guidance on the use or non-use of these resources and interactions between them, conflict has arisen among these laws (Eagle et al. 1998). An example of this conflict is between the ESA and the MMPA regarding appropriate steps to protect listed species of salmon from predation by expanding California sea lion and Pacific harbor seal populations.

A guide for developing a policy regarding conflicts between protected species may be found in Mangel et al. (1996), which examined and suggested revisions to Holt and Talbot's (1978) principles for the conservation of wild living resources. Mangel et al. (1996) included a principle stating that the goal of conservation should be to secure present and future options by maintaining biological diversity at genetic, species, population, and ecosystem levels. Following this principle, management decisions should be directed toward minimizing risks to biodiversity. In the case of expanding pinniped populations that may be having an impact on depressed salmonid populations, particularly those that are listed, proposed for listing, or candidates for listing under the ESA, the loss of individuals from such salmonid populations would be a greater risk to biodiversity than removing relatively small numbers of individual pinnipeds from robust populations. Although the 1994 Amendments to the MMPA allow states to request authority for the lethal removal of certain pinnipeds to protect salmonid populations, this authority is limited to those cases where it can be clearly demonstrated that individually identifiable pinnipeds are having a significant negative impact on the status or recovery of a particular salmonid population. The PSMFC and the States have characterized the authorization process as cumbersome and believe the amount of evidence needed to establish that specific pinnipeds are indeed having such an impact on a given salmonid population is exceedingly time-intensive, difficult, and expensive to obtain as illustrated by the California sea lion conflict with steelhead at the Ballard Locks. There is no provision in the MMPA to accommodate normal or expected uncertainties in the determinations, and this reduces the ability of resource managers to enhance biodiversity in the affected system by protecting listed salmonids.

Garrott et al. (1993) described the successful recovery of many populations of wild animals from depletion and noted that there is no management criterion describing a goal for recovery nor what to do to avoid or mitigate conflict with other resources when they occur. Garrott et al. (1993) observed that most of the earth is not in a pristine state, with species confined to limited spaces with artificial boundaries. Species that can thrive in human-altered habitats (e.g., California sea lions and Pacific harbor seals) will increase and may overwhelm more sensitive species (e.g., salmonids), which, in turn, leads to areas of decreased diversity. These species will also increasingly come into conflict with humans, such as is now occurring with pinnipeds on the West Coast. Both Garrott et al. (1993) and Aplet et al. (1992) predict that active management of populations will become more important as common species displace more sensitive species and disperse from remote or protected areas into the unprotected, semi-natural matrix of suburban, agricultural, and nonagricultural areas (as has been observed with expanding pinniped populations). These and other authors note that management actions to control abundant populations will not be popular with much of the public. When uncertainty regarding the need or benefits of such actions are added to the decision-making process, these decisions will be even more difficult. Nonetheless, postponing management decisions until scientific certainty is reached leads to management failure (Mangel et al. 1996, MacCall 1996).

Mangel et al. (1996) note that sociological and economic impacts of management alternatives should be explored, and Wagner (1996) added that society's values should guide natural resource policy and management decisions. Wagner (1996) also notes that many ecosystems have been perturbed far beyond the boundaries of natural variation, and that the increasing human population will result in

these ecosystems being subjected to additional perturbation to support that human population. NOAA (1996) noted that over 50 percent of the U.S. population inhabits the 10 percent of the land area that is coastal, and that coastal populations are growing at a faster rate than those inland. Therefore, human conflicts with other coastal inhabitants (e.g., California sea lions and Pacific harbor seals) are likely to increase in the future. A sound and consistent policy for making management decisions for conserving coastal resources and resolving human conflicts with these resources is imperative.

The legislative history of the MMPA includes provisions for management of marine mammals from its inception. The reports accompanying initial passage of the MMPA contain discussion of population management principles. These reports, however, stressed that management of marine mammal populations be done with the interest of the marine mammal as the prime consideration. While recognizing that it was not in an individual animal's interest to be removed from the population, the reports suggested that it could help an entire population to remove excess members.

The early management provisions, however, necessitated a determination that the affected marine mammal population must be within its OSP level and that management measures would not reduce the population below the OSP level. The functional definition of "optimum" is based upon historic abundance, or upon the inherent productivity of the population and the ability of its environment to support the population. The statutory definition of OSP requires that stocks of marine mammals be above the maximum net productivity level, which, in turn, requires knowledge of the history of human-caused mortality or some sensitive measure that density dependent factors related to carrying capacity are affecting population growth rates. Such a determination is not likely in the near future for California sea lions and for all of the Pacific harbor seal populations. The Scientific Investigation (NMFS 1997) found that available scientific evidence did not conclusively demonstrate that these pinniped stocks are above the maximum net productivity level and, therefore, would not support an OSP determination in the immediate future, even though the populations are robust and increasing, and clearly continue to be functioning elements of the ecosystem. Preliminary analyses of more recent data indicate that the coastal harbor seal populations in Washington and Oregon may be at OSP; further analysis and preparation of manuscripts for peer review are currently underway.

The 1994 Amendments to the MMPA recognized an alternative to OSP determinations as a mechanism to authorize the taking of marine mammals under certain circumstances. The MMPA now allows taking to occur incidental to commercial fishing operations so long as such taking do not exceed the "Potential Biological Removal" (PBR) level for a marine mammal population. PBR is defined as the maximum number of individuals that can be removed annually from a population, by other than natural causes, and allow that population to reach or maintain its OSP. As long as the total of human-caused mortality was below the calculated PBR level, such mortality would not prevent the affected populations from reaching and remaining within its OSP and remaining as a functional element of its ecosystem. Therefore, this approach could allow lethal removals of pinnipeds for management purposes at such a level that would not disadvantage the affected stock

(i.e., the total takes are below PBR), even if that population's OSP cannot be estimated quantitatively.

Historically, the MMPA and associated regulations have allowed lethal measures to solve management problems involving selected individual marine mammals. Humane euthanasia by government officials has been allowed to protect the public health and welfare or for the protection or welfare of the mammal. With implementation of the 1994 Amendments to the MMPA, citizens now may use lethal measures to protect human life from immediate danger. Prior to the 1994 Amendments, lethal measures by commercial fishers were authorized in cases where pinnipeds were damaging gear and catch and could not be deterred by non-lethal means. However, the intentional killing of marine mammals in the course of commercial fishing operations was explicitly prohibited in the 1994 Amendments to the MMPA. Accompanying the prohibition on intentional killing, Congress included deterrence provisions that allow the public to use non-lethal measures to deter marine mammals from damaging private property, including fishing gear and catch. Unfortunately, available non-lethal measures have not proven reliable in all situations. CDFG notes that this situation has resulted in frustration and distrust by many recreational and commercial fishers.

Through the MMPA, marine mammals were reserved a special status among wildlife species. The conditions under which marine mammals could be removed were severely limited upon passage of the MMPA. The authority of state resource agencies was restricted, and these agencies often could not use routine wildlife management measures to resolve pinniped conflicts. However, the 1994 Amendments to the MMPA, specifically the provisions of Section 120, suggest that the concept of complete protection for abundant, expanding populations of pinnipeds may need re-evaluation. In addition to allowing the lethal removal of certain individual pinnipeds, Section 120 of the MMPA brings attention to conflicts arising between humans and the increasing populations of California sea lions and Pacific harbor seals. These provisions recognize that certain populations of marine mammals have recovered from past depletion and are causing conflict with human use of other resources in marine ecosystems. The conflicts are often exacerbated by human modification of coastal ecosystems.

CONCLUSIONS

California sea lions and Pacific harbor seals are abundant, increasing, and widely distributed on the West Coast. Many salmonid populations, which are declining due to a host of factors, are being preyed upon by pinnipeds. This predation often occurs in areas where depressed, threatened or endangered populations of salmonids must pass to reach spawning areas as adults or the sea as smolts. Where salmonid passage conflicts have been adequately documented, such as at the Ballard Locks, there is sufficient evidence to show that pinnipeds can have a significant negative impact on a salmonid population. The Scientific Investigation Report indicates that there are a number of sites along the West Coast where there is a high potential for pinniped impacts on salmonid populations.

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CONCLUSIONS

California sea lions and Pacific harbor seals are abundant, increasing, and widely distributed on the West Coast. Many salmonid populations, which are declining due to a host of factors, are being preyed upon by pinnipeds. This predation often occurs in areas where depressed, threatened or endangered populations of salmonids must pass to reach spawning areas as adults or the sea as smolts. Where salmonid passage conflicts have been adequately documented, such as at the Ballard Locks, there is sufficient evidence to show that pinnipeds can have a significant negative impact on a salmonid population. The Scientific Investigation Report indicates that there are a number of sites along the West Coast where there is a high potential for pinniped impacts on salmonid populations.

Although the scientific information on the nature and extent of conflicts between pinnipeds and other elements of West Coast ecosystems is limited, it is clear that there are a number of places where these conflicts do exist, and reports of them are increasing in frequency and degree as the pinniped populations grow. Existing food habit information, and that which is likely to be collected in the near future, will not be sufficient to determine highly precise levels of impacts to individual salmonid populations from pinniped predation. The question then to be asked is, "How precise must information be in order to support management actions that protect important declining or listed fish resources (e.g., salmonids) from predation by limited numbers of individual pinnipeds?" Given the depressed and often critical status of some salmonid populations on the West Coast and the robust status of California sea lion and Pacific harbor seal populations, salmonids need to be given precedence when conflicts arise between these protected species. In areas where predation on depressed salmonid populations is found to be frequent and common, reasonable options must be made available to managers to implement actions that protect critical resources, without striving to obtain "perfect" and largely unobtainable information in every case. Although additional information can and should be collected in these instances, remedial action must be taken in certain situations where thorough documentation may be lacking in order to preserve an array of options for salmonid recovery. While this need is not as immediate where the status of salmonids is only depressed and not critical, it should not be necessary for a salmonid population to reach ESA-listing status before action is taken to remove individual pinnipeds that are affecting recovery.

Pinnipeds also conflict with human use of other marine resources, such as commercial and recreational fishing, cause damage to docks and boats, and create human safety issues. In most cases, accurate or comprehensive assessments of the extent or impact of these conflicts have not been completed. Incomplete documentation makes these conflicts no less real, however, and some are imposing economic hardship on fisheries and affiliated enterprises and communities. Unfortunately, safe and effective deterrence alternatives are not likely to become available in the near future unless additional funding is devoted to new research and development.

Resolving pinniped conflicts with human activities is controversial. Because pinnipeds are marine mammals, there are public perception and legal problems in treating them similar to other wildlife species. Because the MMPA offers protections for all stocks of marine mammals, some members of the public do not distinguish between the level of protection needed for abundant, increasing stocks of marine mammals, such as California sea lions and Pacific harbor seals, and those that are truly endangered, such as North Atlantic right whales. Therefore, when conflicts develop between fishers and pinnipeds, some people will often argue for protection of the pinnipeds regardless of the damage and economic losses incurred in fisheries. Further, because pinnipeds are protected under the MMPA, state resource management agencies are unable to resolve many otherwise routine wildlife problems that involve pinnipeds. For example, over-abundance of deer in a particular area is usually handled by removing a portion of the herd. Nuisance predators such as bears and mountain lions can be lethally removed by state resource agencies before they pose an immediate threat to human safety. However, state agencies may lethally remove a pinniped only if it is sick or diseased or if it is involved in an immediate human safety problem. Although resource agencies may

use non-lethal measures on pinnipeds, there is no authorization under the MMPA to allow state or federal resource agencies to take immediate lethal action with a strictly "nuisance" pinniped, even if such action is clearly warranted to prevent a more serious problem in the future.

RECOMMENDATIONS

In those cases where enough is known about pinniped affects on other living marine resources to raise valid concerns, management action should not be delayed while waiting for precise scientific documentation that eliminates all uncertainty. Delaying management decisions in those situations where there is an immediate need for action only increases the risk of losing present and future options. In that regard, these risks have been evaluated, and the following recommendations were developed to address issues regarding California sea lion and Pacific harbor seal impacts on salmonids and, more broadly, on human activities in coastal ecosystems. These recommendations are conservative in that they only recommend lethal taking of individual pinnipeds (rather than large-scale removal or population culling programs) and such taking are limited to specified sites and situations. Congress should work with PSMFC, the West Coast States, NMFS, other federal agencies, and the public to consider legislation where necessary to implement the following recommendations.

A. Implement Site-specific Management for California Sea Lions and Pacific Harbor Seals

Congress should consider a new framework that allows state and federal resource management agencies to immediately address conflicts involving California sea lions and Pacific harbor seals. This framework should provide a streamlined approach for federal and state resource management agencies to take necessary and appropriate action with pinnipeds that are involved in resource conflicts. The framework should provide procedures for lethal removal of California sea lions or Pacific harbor seals where these species are impacting severely depleted salmonids, such as those listed under the ESA. In addition, the framework should provide procedures for lethal removal where these pinniped species are adversely impacting salmonid populations identified as being of special concern by states, or where these pinniped species are in conflict with human activities.

Under this framework, state and federal resource management agencies would have a general authorization to lethally remove California sea lions and Pacific harbor seals, under the conditions described below, to immediately resolve certain resource conflict issues. State agencies would report any lethal takes of pinnipeds to NMFS within 72 hours, and NMFS would manage these takes, in addition to all other sources of human-caused mortality, so these removals would remain within the PBR level for the involved pinniped population. Lethal methods would be discontinued once safe, effective, and long-term non-lethal methods are developed for the specific situations. Agency personnel who participate in lethal removal activities would be trained, or demonstrate the ability,

to distinguish among California sea lions, Pacific harbor seals, and other pinniped species that may be present in the area, in order to avoid accidental removals of other pinniped species.

The three components of this framework are as follows:

(1) *In situations where California sea lions or Pacific harbor seals are preying on salmonids that are listed or are proposed or candidates for listing under the ESA, immediate use of lethal removal by state or federal resource agency officials would be authorized.* This authorization would only apply to those areas where resource agencies have determined that there is an urgency to immediately remove pinnipeds lethally, without having to expend resources on non-lethal methods that are not likely to provide immediate resolution to the conflict. This authority would be exercised only if (1) salmonid conservation or recovery plans are in place or in development, (2) recovery efforts on other factors affecting salmonid status are underway, and (3) lethal removal of pinnipeds is consistent with salmonid conservation/recovery plans. Under this authorization, lethal removal would occur only in specific areas where the conflicts occur, such as locations where salmonid passage is restricted or impeded and only during the period when affected salmonids are migrating through the area. It would be inappropriate to use this approach, for example, to remove pinnipeds in lower estuary areas when the actual predation problem clearly occurs upstream at a fish passage restriction. In addition, this immediate lethal authorization should not apply uniformly to every river system within the range of a listed salmonid population. Lethal removal would be inappropriate in cases where a particular salmonid run in a river system within the listed salmonid population is doing relatively well, and resolving predation at that site is not a recovery need.

(2) *In situations where California sea lions or Pacific harbor seals are preying on salmonid populations of concern or are impeding passage of these populations during migration as adults or smolts, lethal takes by state or federal resource agency officials would be authorized if (a) non-lethal deterrence methods are underway and are not fully effective, or (b) non-lethal methods are not feasible in the particular situation or have proven ineffective in the past.* This authorization would apply to those areas where (1) pinnipeds are preying on state-listed "depressed," "critical," "sensitive," or similarly identified salmonids, (2) recovery efforts on other factors affecting salmonid status are underway, and (3) removal of pinnipeds is consistent with salmonid conservation/recovery planning. It also would apply to situations where pinnipeds are impeding passage during migration of these populations. Lethal removal would occur only when and where salmonids are present and only after non-lethal measures have been considered and applied to the extent practicable. Non-lethal means could first be used to drive pinnipeds out of an area, for example, but those few individuals that remain and successfully prey on salmonids could be lethally removed. It would not be necessary to repeat tests of non-lethal methods that have proven ineffective in similar situations in other areas.

(3) *In situations where California sea lions or Pacific harbor seals conflict with human activities, such as at fishery sites and marinas, lethal removal by state or federal resource agency officials would be authorized after non-lethal deterrence has been ineffective.* Lethal removal would be used

only in those few situations when (a) an individual pinniped is repeatedly involved in a conflict situation, such as an individual sea lion that regularly interferes with fishing operations, repeatedly raids bait barges or fish pens, or frequently blocks access to a marina; and (b) non-lethal deterrents that have been applied to the individual pinniped have not been effective. Two types of pinniped behavior would indicate ineffective use of non-lethal deterrence, which are characterized in the following examples: (1) a sea lion or seal is on a dock and does not leave when non-lethal measures are attempted and (2) an individual pinniped reacts to deterrence measures by leaving a dock and returns repeatedly after the person who has used the deterrence has left the immediate site. Under this authorization, the use of non-lethal methods would be required at the outset, and would be the primary method of response. This authorization would allow state and federal resource agencies to more effectively resolve specific pinniped conflict situations where pinnipeds may not respond to non-lethal deterrents.

B. Develop Safe, Effective Non-lethal Deterrents

Effective non-lethal deterrence methods may be the key to resolution of many conflicts involving humans, pinnipeds, and other marine resources on the West Coast. California sea lions and Pacific harbor seals have demonstrated a remarkable ability to adapt to, avoid or circumvent most types of non-lethal deterrents. Where that is true, lethal removal remains the only effective alternative until satisfactory deterrence measures are developed. Satisfactory deterrence methods are those that would be effective in resolving the immediate conflict and would not have detrimental incidental effects.

In order to provide a broader array of options than lethal removal, there is a pressing need for research on the development and evaluation of deterrent devices and further exploration of other non-lethal removal measures such as the use of emetics for behavior modification. All potential options need to be evaluated in a concerted, adequately funded effort to address this issue. Impediments to testing non-lethal deterrent technologies need to be removed. Because there is a shortage of expertise in deterrence technologies within NMFS due to continuing research needs for stock assessments, other development alternatives (e.g., external grant programs) need to be considered. Research and development of pinniped deterrence methods should be a research priority for addressing expanding pinniped populations on the West Coast. Investigating innovative new techniques will require adequate funding.

C. Selectively Reinstate Authority for the Intentional Lethal Taking of California Sea Lions and Pacific Harbor Seals by Commercial Fishers to Protect Gear and Catch

Congress should reconsider authorizing the use of intentional lethal taking of California sea lions and Pacific harbor seals until such time that effective non-lethal methods are developed for their specific situation. Prior to the 1994 Amendments to the MMPA, commercial fishers were allowed

to kill certain pinnipeds as a last resort in order to protect their gear or catch. Although the 1992 NMFS legislative proposal recognized that there was a need for such authority in certain situations, this authority was not included in the 1994 Amendments to the MMPA. It was replaced with authority to use deterrence measures that do not kill or seriously injure marine mammals. Non-lethal authority has proven to be of little use because no effective long-term deterrence methods are known. Conflicts between fishers and pinnipeds have become more frequent, and the economic losses due to pinnipeds have increased. This has also placed increased pressure on federal and state resource agencies to take action to resolve the problems.

These authorizations should be based on a demonstrated need, and be limited to specified areas and fisheries. Fishers who receive such authorizations should be trained, or demonstrate the ability, to distinguish among California sea lions, Pacific harbor seals, and other pinniped species that may be in the area, to prevent accidental takes of other pinniped species. From a biological perspective, the limited return of lethal deterrence should not be a problem for either California sea lion or Pacific harbor seal populations. The lethal removals that were authorized prior to 1994 did not prevent either population from increasing at five to eight percent per year. Similarly, a limited restoration of this authority would not be expected to adversely affect the continued growth of either population, because it would affect only those individuals that have learned to target commercial fishing operations as an easy source of food. Reporting such takes would be required, and the PBR approach used for incidental taking under Section 118 would be used to limit all removals to biologically sustainable levels.

D. Information Needs

Although there is sufficient information to warrant action to remove pinnipeds from areas where they co-exist with and prey on salmonid populations of concern, there is an array of additional information needed to evaluate and monitor California sea lion and Pacific harbor seal impacts on salmonids and other components of the West Coast ecosystems. These information needs include:

- Conducting site-specific investigations on pinniped predation impacts on various salmonid populations. This would include quantifying composition of the diet and food habits requirements, based on age/sex class information appropriate for the area of concern, and considering site-specific predator abundance temporally and spatially.

- Conducting state-by-state and river-by-river investigations on salmonid populations that are vulnerable to pinniped predation.

- Conducting studies of comparative skeletal anatomies of different salmonid species, so that specific prey species may be identified in food habits studies using scat and gastrointestinal tract analyses.

- Conducting research on site-specific seasonal abundance and distribution of California sea lions and Pacific harbor seals north of Point Conception.

- Conducting research to assess and evaluate potential impacts of pinnipeds on specific fisheries and fishing areas.

- Conducting socioeconomic studies on impacts of pinnipeds on various commercial and recreational fisheries.

- Conducting ecosystem research where the impacts of pinniped predation on non-salmonid resources can be addressed, beginning with small systems such as Puget Sound and expanding those studies to larger West Coast ecosystems.

- Collecting unbiased samples for food habit studies. This may require the direct lethal collection of pinnipeds for analysis of stomach contents.

Research in the above areas is needed, but completion of such research should not be viewed as a prerequisite to undertaking necessary actions and recommendations to address existing pinniped conflict situations identified in this report.

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APPENDIX

Summary of Public Comments and Responses

A draft of this report was made available to the public for comment for 90 days. Notice of availability of the draft report along with the supporting Scientific Investigation Report was published in the *Federal Register* (62 FR 14889) on March 28, 1997 and the public comment period closed on June 26, 1997. NMFS also issued a press release on March 28, 1997, announcing the availability of these reports. Copies of the draft report were distributed widely to encourage public review and comment. Over 300 letters with comments on the report were received. In addition, over 3,000 postcards (all with the same comment) were received.

Comment 1. The report does not fully discuss the extent to which salmon habitat degradation and loss, restricted fish passage, and overfishing have contributed to declines in salmonid populations and what is being done to address these other factors.

Response. The effects of habitat degradation, restricted fish passage, and overfishing on salmonids are well documented in the scientific literature and other NMFS documents relative to ESA listings of salmon and consultations under Section 7 of the ESA. These documents, in addition to habitat conservation plans prepared under Section 10 of the ESA, include many of the salmon conservation and recovery efforts underway to recovery salmonid populations. For instance, there are numerous federal, state and local efforts underway to restore, improve and protect salmon habitat, to improve fish passage through barriers, and to prevent harvests of weak stocks of salmon. These efforts are also well documented in State conservation plans, forestry plans, fishery management plans, and basin specific plans such as those prepared for the Columbia River basin by the Northwest Power Planning Council. Inclusion of all of the salmon recovery and conservation efforts currently underway would expand the length of this report many-fold and detract from the Congressionally-mandated scope of this report which is to specifically address pinniped impacts on declining salmonid populations. Nonetheless, the recommendations were modified to emphasize that recovery efforts addressing factors other than pinniped predation would be considered in management actions.

Comment 2. Pinnipeds and salmon have co-existed for hundreds of years, and lethal removal of pinnipeds from river mouths is not warranted. Habitat degradation and loss, logging, water diversion, overfishing, coastal development and over-population of people are the causes for salmon decline, not pinniped predation.

Response. NMFS agrees that pinnipeds were not a major factor in the coastwide salmonid population declines on the West Coast. However, now that some salmon populations are depressed and listed under the ESA, pinnipeds can affect recovery and can cause the further decline of small salmonid populations in certain situations. The potential for pinniped impacts on salmon also is now greater than the past because pinniped populations have increased to historically high levels and their ranges have expanded. Habitat alterations, which have affected natural river flow patterns and

impeded or modified fish passage inriver, also may have contributed to improving pinniped foraging efficiency, thereby further increasing the potential for pinniped impacts on salmonids.

Comment 3. The problems with pinnipeds do not justify a coastwide pinniped cull program.

Response. The recommendation would not establish a coastwide culling program. The recommendation is to establish a framework to authorize a limited, selective removal of individual pinnipeds in certain situations such as where pinnipeds are impacting depressed salmonids that are listed, proposed for listing, or candidates for listing under the ESA. The following conditions would apply to the authority: (1) salmonid recovery or conservation plans are in place or are being developed; (2) salmonid recovery efforts on other non-pinniped factors are underway; (3) lethal removal of pinniped is consistent with such recovery/conservation plans; (4) lethal removal is limited to individual animals only at the specific sites where conflicts occur; (5) lethal removal is limited to only the period when affected salmonids are migrating through the site; (6) resource management agencies report lethal removals within 72 hours of the taking; and (7) lethal removals would not exceed the PBR level for California sea lions or harbor seals. See response below to Comment #13 for further elaboration on NMFS views on a culling program.

Comment 4. Seals and sea lions should not be intentionally killed.

Response. NMFS acknowledges that non-lethal methods are the preferred approach, but in some situations, lethal removal is the only remedial approach available to protect other resources from negative impacts from California sea lions and Pacific harbor seals. With the critically depleted status of many salmonid populations, the risk-averse approach to eliminating impacts on these populations warrants the need to kill pinnipeds in certain situations where the pinniped are adversely affecting the salmonid populations. California sea lion and Pacific harbor seal populations are robust and healthy and would not be negatively affected by the low levels of lethal removal in the recommendations. The recommendations also specify that lethal methods are to be discontinued once safe, effective, and long-term non-lethal methods are developed for the specific situations.

Comment 5. The problem with lethal taking (from a biological perspective) is not with the California sea lion or harbor seal populations, it is the potential impact of indiscriminate or inadvertent taking of other marine mammals, such as Steller sea lions (Eastern Stock) on the West Coast and southern sea otters, which are both listed as threatened under the ESA.

Response. The recommendations apply only to California sea lions and Pacific harbor seals. The prohibitions on the taking of Steller sea lions and sea otters would not change. Recommendation A, which is to "Implement Site-specific Management for California Sea Lions and Pacific Harbor Seals," applies only to state and federal resource management agency officials. There would be no indiscriminate or inadvertent lethal taking of other marine mammals under this recommendation because only those resource agency officials who are experienced and trained in identifying pinnipeds would be involved in any lethal removal of Pacific harbor seals or California sea lions. Recommendation C, which is to "Selectively Reinstate Authority for the Intentional Lethal Taking of California Sea Lions and Pacific Harbor Seals by Commercial Fishers to Protect Gear and Catch" would only apply to certain fishers in certain circumstances in designated fisheries and areas that are authorized to use lethal removal as a last resort. In the process of determining

what fishery, area and circumstances that this authority would apply, NMFS would definitely consider potential impacts on other species especially Steller sea lions and sea otters. For example, in situations where fishers may encounter both California sea lions and Steller sea lions and may not be able to distinguish each species, an authorization for lethal removal would be conditioned or not issued.

Comment 6. In most cases, reduction of pinniped predation by itself will not bring about the recovery of depressed salmonid stocks. The full range of factors that have brought about the decline of salmonid stocks (and may be impeding their recovery) must be identified and addressed to achieve recovery within a reasonable time frame.

Response. NMFS agrees and has modified the recommendation accordingly. The recommendations in this report are now conditioned on salmonid conservation and recovery efforts being underway to address other factors affecting the recovery for each salmonid population where actions may be considered to remove pinnipeds. The recommendations have also been modified to specify that salmonid conservation and recovery plans must be in-place, or under development, in those systems where lethal removal of individual pinnipeds may be considered to protect and recover salmonid populations and that removal of pinnipeds is consistent with recovery/conservation plans.

Comment 7. The Scientific Investigation Report concludes that it cannot be determined if pinnipeds have had a significant negative impact on any wild salmonid population, except for California sea lion impacts on Lake Washington steelhead. With the lack of scientific substantiation, the recommendations for lethal removal are not justified or warranted.

Response. NMFS agrees that the Scientific Investigation Report concludes that it cannot be determined if pinnipeds have had a significant negative impact on any wild salmonid population on the West Coast, except for California sea lion impacts on Lake Washington steelhead. However, the Scientific Investigation Report also concludes that in areas of co-occurrence of pinnipeds and salmonids, pinniped predation on small salmonid populations, especially at areas of restricted fish passage, can have negative impacts on the recovery of depressed salmonids. The recommendations were developed to address those situations where lethal removal of a small number of pinnipeds may be necessary to complement other recovery efforts for depressed salmonid populations.

Comment 8. The conclusion that pinniped predation could have a significant impact on a number of depressed salmonid stocks no doubt is valid. However, the report provides no evidence that pinniped predation is actually impeding recovery of any depleted salmonid stocks other than the Lake Washington winter steelhead population that migrates through the Ballard Locks.

Response. This report summarizes information from the Scientific Investigation Report, which provides the scientific basis for the determination that pinniped predation can impair the recovery of ESA-listed salmonids in certain situations.

Comment 9. NMFS should evaluate and assess the level of pinniped predation on salmonids and pursue the research recommendation contained in the Scientific Investigation Report before recommending management measures.

Response. Recommending strong management measures are far less controversial when management agencies have reliable scientific information supporting them because there is less risk of management error. Such information does not exist in most instances to assess the affect of pinniped predation on salmonids. NMFS evaluated the risk to the affected populations of removing a few California sea lions or Pacific harbor seals against continued predation on critically depleted salmonid runs. As a result of that evaluation, NMFS believes that management error favoring salmonids is preferable to management error favoring the pinnipeds in certain situations. Postponing management actions until resource agencies collect sufficient information to address the conflict with scientific certainty leads to management failure (as noted in the report); therefore, the recommendation for site-specific management measures remains in the final report.

Comment 10. Salmonids do not make up an important component of the harbor seal diet.

Response. Research illustrates that California sea lions and Pacific harbor seals are opportunistic feeders, with diets consisting primarily of prey that are seasonally and locally abundant. In the Columbia and Rogue River systems, which have been studied most extensively and recently, salmon occurred in 43% to 60% of harbor seal scat samples during autumn when adult salmon are returning to spawn; in the spring, when juvenile fish are exiting the rivers as smolts, the frequency of occurrence of salmon in harbor seal scat samples ranged from 20% to 33%. In seasons when adult salmon are not entering the rivers or juveniles leaving the river, the frequency of salmon in harbor seal diets falls to zero. Similarly, in areas where California sea lions are concentrated at the mouths of rivers or in the estuaries, they can be effective predators of adult and juvenile salmon. Salmon appeared in 5% to 50% of sea lion scat or stomach samples collected in or near rivers along the West Coast, but do not occur in any of the food habits samples of males collected from large hauling grounds on islands, such as the Farallons or Año Nuevo Islands in central California. The Scientific Investigation Report noted seasonality in the occurrence of salmonids in harbor seal and sea lion food habits, and when salmon are available, they may constitute an important component of these animals' diets. However, the frequency in which salmon remains are found in sea lion or harbor seal scat samples is a poor measure of the affect on salmon runs. Where predation occurs on critically depleted salmon runs, the removal of only a relatively few returning adults may have a severe impact on the entire year class.

Comment 11. The recommendations will not improve or enhance salmonid populations, but rather will harm salmonids by diverting attention away from the major problems affecting salmon such as habitat degradation and loss.

Response. NMFS modified the recommendation so that the lethal taking of pinnipeds would be authorized only if a recovery or conservation plan for the affected salmonid stock exists or is under development. Therefore, these recommendations would not affect the aggressive position that NMFS maintains on restoring and improving salmon habitat and resolving other factors affecting salmon recovery. The recommendations would promote a comprehensive approach to salmon recovery and conservation by providing a mechanism to address pinniped predation, which also can affect salmonid recovery in certain situations.

Comment 12. Only the negative impacts of predation by pinnipeds and the negative impacts pinnipeds have on the ecosystem are described. The report should acknowledge the complexity of

the ecosystem and describe the beneficial role of pinniped predation on other fish predators (such as lamprey) as part of the larger interrelationship between pinnipeds and salmonids. Other direct benefits, such as beneficial effect of carcasses and feces as a nutrient in the ecosystem and availability as prey to larger, and possibly threatened or endangered predators, should be included in the report.

Response. The purpose of this report as stipulated in the MMPA is to "address the issues and problems identified as a result of the scientific investigation, and develop recommendations to address such issues or problems." The complexity of the ecosystem and the role of pinnipeds, including beneficial aspects, are included in the Scientific Investigation Report; however, the focus of this report is on the problems identified from the Scientific Investigation Report with pinniped impacts on salmonids and the ecosystem and, therefore, is consistent with the pertinent mandate in the MMPA.

Comment 13. Current pinniped population levels are causing significant damage to, and prohibiting the recovery of, salmon and marine species that have previously been reduced by a variety of impacts. Pinniped population levels should be reduced, at least temporarily. This will allow these species to continue to be viable components of a functioning ecosystem and would allow growth of pinniped populations as salmon and other species rebuild. Many West Coast salmonid stocks are depressed and could benefit from reduced pinniped populations.

Response. The recommendations would apply only to removal of individual pinnipeds at specific sites where conflicts occur. The recommendation is not to reduce the overall abundance of pinniped populations; the selective taking would be limited and capped below the potential biological removal (PBR) level for each species so that the MMPA goal for achieving optimum sustainable population (OSP) levels for all marine mammal populations could be met. Pinniped population reduction or culling programs are not an appropriate means of addressing the site-specific pinniped problems that are identified in this report because a culling program may not remove the individual animal or animals that are causing the problems.

Comment 14. The application of the concept of OSP for California sea lions and Pacific harbor seals has failed to adequately consider the other impacts to the ecosystem, as required by the MMPA. This is due to the variability of the populations themselves, and also the NMFS desire to allow the populations to expand to levels beyond carrying capacity to better define the population curve. Unfortunately, this population level causes significant damage to other components of the ecosystem prior to being able to quantify OSP.

Response. The concept of OSP is fundamental to the MMPA, and these recommendations would not change that. The MMPA states that OSP determinations must keep in mind the carrying capacity of the habitat and the health and stability of marine ecosystems, and it also states that management decisions must be made on the best available scientific information. As stated in the Scientific Investigation Report, scientific information related to pinniped effects on the ecosystem has not been collected and analyzed; therefore, NMFS cannot adequately consider such impacts. The recommendations are a means to address the ecosystem objective in the MMPA, but they are limited to addressing the specific problems identified as a result of the scientific investigation requested by Congress. The recommendations would address these specific situations without changing the OSP

goal in the MMPA. See response above to Comment #13 regarding the limits on taking and population reduction.

Comment 15. Marine mammal populations are an important part of the West Coast wildlife heritage, however management responsibilities include the responsibility to control those parts of wildlife population which are in conflict with other parts of an ecological system. The protections for pinnipeds under the MMPA have created an imbalance which benefits pinnipeds but is costly to other species.

Response. The recommendations were developed with the intent to balance the maintenance of sustainable pinniped populations while allowing actions to be taken to remove pinnipeds where they impact the viability of other components of the ecosystem. NMFS recognizes that various constituents disagree on the use of lethal methods to address human/pinniped conflict, and this disagreement is intensified by highly polarized viewpoints among constituencies, the lack of a consistent, unifying federal policy on natural resource use or non-use, and the lack of clear acceptance on the role of human activity (commercial and recreational) in marine ecosystems. The MMPA favors protection of marine mammals, and these recommendations would continue such protections; however, the recommended course of actions would allow more flexible management actions that would not affect the ability of marine mammal stocks to achieve and maintain OSP levels.

Comment 16. California sea lions and Pacific harbor seals are over-populated and must be substantially reduced to allow for recovery of threatened and endangered species. Pinniped populations need to be brought in line with other components of the ecosystem. NMFS should start a program of eliminating the over-population of pinnipeds.

Response. The concept of over-abundant populations is not clearly understood on either the scientific or management levels. The scientific literature contains many references to this concept, and over-abundance has been categorized according to the level of impact the affected population of animals is having with human activity or other components of the affected ecosystem; these categories include situations in which some animals conflict with human life and livelihood to situations in which one populations causes a permanent change in an ecosystem. California sea lion and Pacific harbor seal populations have not been conclusively determined to have reached or exceeded the carrying capacity of the ecosystem, which is the upper end of the OSP range for marine mammals. Preliminary analyses of more recent data indicate that the coastal Pacific harbor seal populations in Washington and Oregon may be at OSP; further analysis and report preparation for peer review is currently underway. The MMPA does have provisions for waiver of the moratorium on taking if a marine mammals population has been demonstrated to be at or above OSP. Furthermore, a population reduction program would not resolve site-specific problems (see responses to Comment #'s 13 and 14).

Comment 17. Not all pinniped stocks are increasing along the West Coast and weakening the protections currently contained in the MMPA may seriously impact these populations.

Response. Ten pinniped populations occur off Washington, Oregon and California. Their status, as reported in the most recent NMFS Stock Assessment Report, is as follows:

Steller sea lion, eastern stock	Population size: 23,900 Status: increasing trend since the 1970's; listed at threatened
Northern elephant seal, CA breeding stock	Population size: 84,000 Status: 8% annual increase
Northern fur seal, eastern Pacific stock	Population size: 1,019,192 Status: stable, had decreased to depleted levels in mid-1970s to early 1980s
Northern fur seal, San Miguel Island stock	Population size: 10,536 Status: about 8% annual increase, 1965-1996
Guadalupe fur seal	Population size: 7,408 Status: 13.7% annual increase, mid-1970's-1993; listed as threatened
California sea lion, U.S. stock	Population size: 167,000-188,000 Status: about 5% annual increase, 1975-1995
Harbor seal, California stock	Population size: 30,293 Status: 3.5% realized rate of increase, 1982-1995
Harbor seal, WA/OR coastal stock	Population size: 27,131 Status: 7.7% annual increase, 1978-1993
Harbor seal, WA Inland Waters	Population size: 16,253 Status: increasing annually

However, the recommendations only apply to the California sea lion and Pacific harbor seal stocks. As described in the response above to Comment #5, the implementation of these recommendations are conditioned to ensure other pinniped populations would not be affected.

Comment 18. The recommendations appear to consider only the motives, interests, and values of PSMFC and fishing interests. Both consumptive and non-consumptive values and impacts must be recognized when maintaining the ecosystem. The report should address non-consumptive values.

Response. The MMPA required that NMFS develop the recommendations in conjunction with PSMFC on behalf of the three West Coast States. The state resource agencies, which form the PSMFC, are responsible for the preservation of natural resources and consideration of non-consumptive views of the public, and this played a significant role in the development of the recommendations. It should be noted that the recommendations retain the OSP goal of the MMPA, and this concept is not fully supported by fishing interests. It should also be noted that some fishing interests advocated a population reduction program, which also is not included in the recommendation. The recommendations provide a balance between maintaining viable populations of pinnipeds while addressing the conflicts associated with California sea lions and Pacific harbor seals.

Comment 19. The Scientific Investigation Report and the Draft Report to Congress were prepared in violation of the Federal Advisory Committee Act (FACA), portions of the Report constitute an unlawful lobbying effort, and portions of the report exceed the mandates of Congress. Congress

itself violates FACA because the legislation mandates meetings between NMFS and PSMFC without fair representation of differing points of view, i.e., conservation groups were excluded. The working group that prepared the Scientific Investigation Report included officers of three different states and the PSMFC, and meets the FACA definition of a federal advisory committee. Therefore, the committee was required to follow the mandates of FACA which include advance public notice and open meetings. The meetings with PSMFC to discuss the results of the scientific investigation also violate FACA because 1) no conservation groups were represented in the discussions, and 2) the States of California, Oregon, and Washington participated in the discussions in spite of the Congressional mandate that NMFS meet with PSMFC *on behalf of* the States.

Response. The Working Group that prepared the Scientific Investigation Report was a technical committee consisting of experts in the field of West Coast pinnipeds and pinniped interactions with salmonids and the ecosystem, and the group compiled existing information and completed analyses rather than providing advice or recommendations to the government. FACA does not apply to such meetings. The meetings with the PSMFC to develop the report, which does include recommendations, were in accordance with the MMPA mandate and included state representatives to enhance and expedite the PSMFC role in acting on the behalf of the States. The meetings among NMFS, state resource management officials, and officials of PSMFC, which is an interstate compact that operates as a state agency, falls under the exception to the FACA established in the Unfunded Mandates Act; therefore, the discussions were not open to the public. NMFS believed, however, that the public should have full opportunity to express its views on recommendations that could be considered controversial, and the long period for public review and comment provided such an opportunity.

Comment 20. The recommendations for lethal removal will undermine the other recommendations for developing safe and effective non-lethal deterrents and responding to information needs. It is unlikely that lethal methods would be discontinued once safe, effective, and long term non-lethal methods are developed. There would be virtually no incentive to develop these alternatives if killing animals is allowed.

Response. The need to conduct research on the development of effective non-lethal deterrents is a common thread throughout the recommendations. Recommendations for use of lethal removal are conditioned with initial use of non-lethal methods in all cases except where ESA listed salmonids are involved, and state or federal authorities determine the need to immediately lethally remove individual pinnipeds. The recommendations specify that lethal removal authority would cease when effective non-lethal deterrents are available.

Comment 21. Other sensitive species, such as Steller sea lions may be impacted by a resumption of lethal taking in fisheries, because fishers are unlikely to distinguish between the sea lion species.

Response. As described in the response above to Comment #5, the implementation of these recommendations are conditioned to ensure other pinnipeds are not affected.

Comment 22. Documentation on the significance of economic impacts to commercial and recreational fisheries and on the trend of such impacts should be provided before allowing the resumption of lethal taking for protection of gear and catch.

Response. A description of economic impacts from limited studies on some fisheries are presented in the Scientific Investigation Report. The recommendations would require that intentional lethal take of California sea lions or harbor seals be based on a "demonstrated need" by each fishery that requests this authority.

Comment 23. Component one of the framework should be modified to allow more flexibility. The phrase "such as locations where salmonid passage is restricted or impeded" should be deleted because even undisturbed estuaries and lower river stretches create situations conducive to high predation.

Response. The phrase describes an example of situations where salmonids are more vulnerable to pinniped predation and is not intended as a restriction on application.

Comment 24. Given the abundant and growing pinniped population, the risk-averse course is to remove individual salmon-eating pinnipeds in the vicinity of depleted and/or declining salmon runs.

Response. NMFS agrees, and the recommendations were designed as a risk-averse approach to resource management.

Comment 25. The fact that pinnipeds are at historically high population levels coupled with the fact that some salmon populations are at very low levels, makes pinniped predation a high priority issue. To ignore the known negative impacts of increasing sea lion and harbor seals is unacceptable. While it is true that more research is necessary to scientifically assess the magnitude of that negative impact, it is also necessary to provide legislative authorization for immediate action in certain situations. This legislative authority is one critical component to the success of the Oregon Coastal Salmon Restoration Initiative.

Response. The recommendations do address the need for resource agencies to have authority to take immediate action in situations where pinnipeds are impacting depressed salmonids so long as there is a salmonid conservation or recovery plan (such as the Oregon Plan) in place to address other factors affecting salmonids in the system.

Comment 26. Since site-specific investigations on pinniped predation impacts are long-term and expensive, they should be structured to apply to a broad category of similar sites. Variability of diets throughout a complete year at a single site(s) is necessary to determine impacts not only on salmonids, but also on marine species of concern.

Response. NMFS agrees, and this would be addressed when studies are designed.

Comment 27. The issues and language contained in the report represent a consensus of the concerns and needs expressed by the respective agencies and provide reasonable management options for dealing with and resolving these concerns. As such, there is strong support for the recommendations as written in the report and NMFS should submit the report as written to Congress as a final report.

Response. Change to the recommendations include modifying Recommendation A to specify that salmonid conservation and recovery efforts must be in place, or under development, that other salmon recovery efforts are underway, and that lethal removal of individual pinnipeds will be consistent with such plans in those watersheds where pinnipeds and salmonids co-occur.

Comment 28. The actions taken at the Ballard Locks, while they did offer some relief, were costly and cumbersome. And many sea lions simply moved to other areas, causing similar problems elsewhere. Therefore, state and federal agencies need more effective authority for dealing with interaction problems.

Response. The recommendations would provide a more streamlined process that allows immediate action by resource agencies in certain situations to remove California sea lions or harbor seals causing impacts on depressed salmonids.

Comment 29. Only a few individual seals or sea lions are responsible for the predation at any given location, meaning that only those individuals actually preying on salmon at a particular location should be removed.

Response. NMFS agrees, and several studies cited in the Scientific Investigation Report support this observation.

Comment 30. NMFS should modify the Potential Biological Removal (PBR) process to allocate lethal removals for management purposes. Resource management agencies could then respond to situations of concern in a timely and efficient manner. Resource agencies would have the ability to take actions and, due to the inherent conservative nature of the PBR process, continue to ensure that the goals and objectives of the MMPA would still be met.

Response. The recommendations would require that lethal taking be within the PBR, but do not propose any type of allocation of the PBR for this and other purposes.

Comment 31. NMFS should give total ownership of the seals and sea lions to the states, giving control for lethal removal of pinnipeds to the states.

Response. Although the MMPA includes a provision for transfer of management authority to the states of those species at OSP, the MMPA does not provide for a transfer of ownership of marine mammals. The recommendations do not affect the MMPA procedures for transfer of management authority to the states for species at OSP.

Comment 32. Treaty Indian tribes in Washington and Oregon are co-managers of treaty resources and as such should be afforded recognition in the recommendations section.

Response. Consistent with administration policy, the Department of Commerce recognizes the unique status of treaty Indian tribes. NMFS is committed to implementing Departmental policy regarding treaty Indian tribes. Although not specifically stated in the recommendations of this report, NMFS will involve tribes and seek tribal input at the appropriate level on policies, rules, programs, and issues that may affect a tribe.

Comment 33. In most situations where agencies may have to deal with pinniped predation on salmonid runs of concern, the existing Section 120 process is unworkable. This was demonstrated when the Section 120 process was used to protect the winter steelhead run from California sea lion predation. Reasonable methods are needed to deal with pinniped predation to recover salmonid runs, particularly when runs are small and every fish is important to the rebuilding process.

Response. The recommendations are to establish a framework that would allow resource agencies to deal quickly with pinniped conflicts where salmonid resources are severely depleted; it would not require completion of the process required by Section 120 for each situation.

Comment 34. The report clearly recognizes the need for site-specific management of pinnipeds from healthy and abundant populations that are preying on threatened, endangered, or otherwise depressed fish stocks. The ability to take rapid and effective action to remove predators at sites where fish passage is restricted by natural barriers, falls, fish ladders, and other structures may be essential to the successful recovery of many salmonid populations. Rapid removal of a small number of animals could reduce the loss of many fish and may prevent the escalation of minor problems to major resource conflicts.

Response. NMFS agrees.

Comment 35. The MMPA currently has provisions to allow mortalities of California sea lions and Pacific harbor seals associated with a variety of human activities (e.g. commercial fishing, subsistence harvest, etc.), while still ensuring that their populations remain within the goals of the MMPA. A similar provision for limited takes by federal and state resource management agencies to protect at-risk salmonid stocks would in no way approach the levels currently authorized under the NMFS Potential Biological Removal process.

Response. Due to the relatively low level of incidental mortality and serious injury of California sea lions and harbor seals in commercial fishing operations and other sources of human-caused removal, NMFS does not anticipate that the potential level of removal under the recommendations would ever approach the PBR levels for these pinniped populations. The recommendations require that pinniped removal authority be under the current PBR process.

Comment 36. Until effective nonlethal removal techniques are developed, it is necessary to allow fishers in certain circumstances to prevent economic loss due to pinniped interactions, as long as all removals are restricted to biologically "safe" levels under the MMPA.

Response. This opinion is consistent with the recommendations.

Comment 37. Additional resources and effort should be invested to develop effective non-lethal options to deter or discourage problem animals involved in fisheries interactions. This includes continued work on acoustic alarms or "pingers" to warn marine mammals of fish gear to reduce incidental takes, as well as developing other non-lethal deterrence methods that actually work to protect gear and catch. The development of safe, non-lethal deterrents is most important in the short term, until the MMPA is amended to allow more active management of the increasing pinniped populations.

Response. NMFS agrees.

Comment 38. Development of a device that allows the sportfishing fleet to deter pinnipeds should be a top priority.

Response. NMFS recommended development of effective non-lethal deterrence devices that may be applicable in many situations.

Comment 39. Federal grant money should be made available for research on the development of non-lethal deterrent technologies to resolve resource conflicts involving pinnipeds on the West Coast, since expanding pinniped populations have demonstrated the ability to adapt to, avoid, or circumvent existing non-lethal deterrent techniques.

Response. When specific funding for research grants for this purpose is appropriated, NMFS will work actively with the scientific and technical communities to request research proposals. Results of past efforts with non-lethal deterrents will be used to guide the development of effective non-lethal technologies. In addition NMFS has made such topics a priority in existing competitive grants programs.

Comment 40. The need to collect sufficient information on the impact of pinniped predation is urgent. Congress should identify funding to be made available to the states to assist in the collection of up-to-date data on interactions between pinnipeds and salmonid stocks and on the significant interactions between pinnipeds and recreational and commercial fisheries.

Response. Federal funding is being provided to the states in FY98 to begin addressing the information needs identified in this report.

Comment 41. Lack of federal funding and current policy implementation of the MMPA has not been effective in the management of predatory pinnipeds. Congress must streamline the process in which the taking of harbor seals and California sea lions is authorized for fisheries conservation purposes.

Response. The framework in Recommendation A would streamline the process for state and federal resource agencies to take actions where necessary for salmonid conservation and recovery and to address other resource conflicts.

Comment 42. Congress should enact the recommendation to selectively reinstate authority for intentional lethal taking of California sea lions and Pacific harbor seals by commercial fishers to protect gear and catch. Until effective nonlethal techniques are developed, it is necessary to allow fishers in certain circumstances to prevent economic loss due to pinniped interactions as long as all removals are restricted to biologically safe levels under the MMPA.

Response. This comment is consistent with the recommendations.

Comment 43. The definition of commercial fisheries should be expanded to include charterboat captains and bait business owners.

Response. Charterboat and bait operations are included in the current List of Fisheries under the MMPA.

Comment 44. California's salmon trollers are being forced to fish 20-30 miles offshore to avoid sea lions which puts fishers at a greater risk due to weather and sea conditions.

Response. The recommendations would allow fishers in certain selected fisheries to use lethal means as a last resort to deter California sea lions and Pacific harbor seals; however, this authority was available to California salmon troll fishers prior to 1994, and it may not affect the incidence of nearshore interactions with sea lions. The recommendations do not propose to reduce the sea lion populations.

Comment 45. Conflicts among existing federal statutes (ESA, MMPA, Magnuson-Stevens Fishery Conservation and Management Act) are apparent when issues of resource conservation are raised. Integrating legislative policy is needed to provide clear direction and authority for those who are charged with addressing the salmonid-pinniped interaction problems.

Response. The need to address apparent legislative conflicts is included in this report.

Comment 46. Because of the difficulty of making observations, it will very often be impractical to clearly document the effects of predation or the effectiveness of removals. Even under nearly ideal conditions, documentation of effects at the Ballard Locks cost well over $1 million (possibly as much as $3 million) and took more than a decade. There is neither time nor money enough to completely document each situation where pinniped predation may be significantly affecting depleted salmon runs.

Response. NMFS agrees.

Comment 47. The recommendations overlook promising solutions to fish passage problems in lieu of scapegoating pinnipeds. The recommendations should be modified to focus on making artificial structures and habitats more fish friendly to reduce human-induced salmonid vulnerability to pinniped predation.

Response. The recommendations for lethal removal of pinnipeds at specific sites where pinnipeds may impact ESA salmonids are intended to complement other recovery efforts. Recovery of salmonid populations will require that fish passage or other factors affecting conservation and recovery of depressed salmonids be addressed.

Comment 48. Any lethal removal proposal will be reactive, temporary, and ineffective because it will not address the more significant problems of pollution, recreational and commercial fishing, and natural population fluxes. In addition, we do not understand the predator/prey relationship in the context of these factors.

Response. The recommendations for lethal removal of pinnipeds at specific sites where pinnipeds may impact ESA salmonids are intended to complement other recovery efforts and are not intended as the sole means for addressing salmonid recovery. Given the size and continuing increase

of pinniped populations, the small number of pinnipeds that might be removed would not be at high enough levels to cause any changes in the ecosystem.

Comment 49. The report should recommend that Congress provide authorization to take such steps as may be needed to reduce pinniped predation when: (1) the proposed action is part of a comprehensive plan to restore one or more specified salmonid stocks; (2) the plan has been made available for public review and has been approved by NMFS; and (3) there is adequate monitoring to determine whether the steps taken are in fact contributing to the recovery of salmonid stocks.

Response. The recommendations were modified to specify that a salmon conservation or recovery plan is in place or in development. The plan should include address all factors affecting recovery including pinniped predation. Such plans have been made available for public comment (e.g., Oregon plan, draft Recovery plans). As stipulated in the recommendations, any taking would have to be reported to NMFS and would be considered in evaluation of recovery efforts.

Comment 50. The report does not describe what has been done to implement MMPA Section 101(a)(4) which authorizes non-lethal, non-injurious deterrence of pinnipeds by members of the public and agency officials for the protection of property or fishing gear. Since the Report recommends that government officials and fishers be authorized to kill pinnipeds to protect property, fishing gear, and catch, this suggests that NMFS has determined that non-lethal deterrents are unlikely to be effective or too costly to implement.

Response. Government officials and commercial fisheries had authority to use non-lethal measures to deter marine mammals prior to the MMPA Amendments of 1994. The provisions of Section 101(a)(4) extended this type of authority to the general public. NMFS' recommendation to use lethal means to control property damage was based largely upon NMFS experience over many years prior to 1994 with non-lethal deterrence at the Ballard Locks, attempts at other sites along the West Coast to resolve conflict with nuisance pinnipeds, and from repeated complaints from fishers attempting to use non-lethal means to protect their gear and catch. NMFS and state officials (as indicated in discussions leading to this report) believe that current non-lethal deterrence technologies will not solve pinniped conflicts in every situation. Therefore, the recommendations in this report acknowledge NMFS' 1992 proposal that situations will arise in which lethal deterrence may be necessary and that Congress should reconsider the prohibition on lethal deterrence in commercial fisheries.

Comment 51. The recommendation to authorize lethal removals by commercial fishers should be deferred until it can be shown with certainty that pinniped problems cannot be addressed effectively using practical, non-lethal means.

Response. The recommendation to selectively reinstate lethal authority would require a demonstration by the fisher that lethal removal is necessary. The authorization would be issued only in those situations where available non-lethal measures are not totally effective. NMFS, however, has clarified the recommendation that Congress reconsider the NMFS proposal of 1992. NMFS believes that such reconsideration would include an open debate in which the various viewpoints on this controversial topic would be aired.

Comment 52. Research and implementation of viable non-lethal deterrence measures, such as those made by the Pinniped-Fishery Interaction Task Force on the sea lion-steelhead conflict at the Ballard Locks and others, are being ignored and rejected by NMFS and state resource agencies.

Response. The utility and effectiveness of non-lethal measures used or considered for use at the Ballard Locks and other sites were reviewed in the Scientific Investigation Report and provided the basis for Recommendation B to develop safe, effective non-lethal deterrents. The need for research on non-lethal measures is not rejected or ignored; rather, the report supports the need for further research.

Comment 53. Pinnipeds should be kept off docks by constructing railings and providing other, more desirable places to haul-out. Those who own boats and berth them in public and private facilities would likely be willing to pay a little more to protect their investments in a non-lethal manner.

Response. Marina and dock owners currently are encouraged to keep pinniped off docks non-lethally to avoid further conflicts with the pinnipeds.

Comment 54. Fish farmers should install anti-predator nets and devices to keep pinnipeds away instead of killing animals.

Response. A number of salmon net pen facilities on the West Coast utilize predator nets, acoustic devices and other non-lethal measures to repel pinnipeds. The recommendation for selective reinstatement of lethal authority requires use of non-lethal measures before lethal taking as a last resort.

Comment 55. The report makes a scientifically unsubstantiated leap in recommending management actions for pinniped species. The Scientific Investigation Report recommends additional research to close identified data gaps rather than proposing that management actions be taken.

Response. The Scientific Investigation Report documents the potential negative effects that pinnipeds can have on salmonids at areas of co-occurrence. The Report does recommend further research to determine the specific levels of impacts in various systems, but not at the risk of adversely affecting ESA-listed salmonids. The management measures recommended take a risk-averse approach by allowing lethal removal of individuals in pinniped populations that have been increasing for many years.

Comment 56. The report mischaracterizes the current understanding of pinniped interactions and the effectiveness of existing deterrent devices and efforts.

Response. The report summarizes information from the Scientific Investigation Report, which documents the best available scientific information on pinniped interactions and the effectiveness of existing deterrent technologies to reduce them.

Comment 57. Additional restrictions on commercial and recreational fisheries, removing barriers to fish passage, and restoring spawning habitat to conserve biodiversity should be considered instead

of penalizing seals and sea lions for eating salmon. Habitat degradation is the single most likely cause for salmon stock declines, not sea lion predation. Until NMFS has effectively addressed human causes of salmonid declines, or until salmonid stocks are threatened with extinction by sea lion predation, there is not adequate basis for the proposed lethal removal measures.

Response. Successful recovery of salmonid populations requires that all factors affecting recovery, including pinniped predation, must be addressed. The recommended measures to control pinniped predation in certain situations where salmonids are at-risk will complement efforts to resolve human-caused and other factors for the decline of salmonid populations. See response to Comment #1.

Comment 58. There appears to have been no consideration given to the possibility that some pinniped problems may be caused by social facilitation (i.e., animals that have learned that certain areas are particularly good for finding and catching prey at certain times of the year attract other animals to those areas). Keeping animals out of such areas or removing the first "problem" animals before they attract others may reduce the number of animals that eventually would have to be killed.

Response. Although not specifically mentioned in the report, "problem" animals serving to attract naive animals was a subject of the discussions in developing the recommendations. Problem animals serving as an attractant was also noted in the 1996 EA prepared by NMFS in conjunction with the authorization for lethally taking California sea lions at Ballard Locks. NMFS expects that these types of problems would be addressed by the recommendations.

Comment 59. The report does not provide any substantiating data to support the statement that "as the number of pinnipeds increase, the likelihood of more pinnipeds discovering these [predation] situations increases, as does the opportunity to pass on such learned behavior to other pinnipeds."

Response. Pinniped-salmonid conflicts at the Ballard Locks, Willamette Falls and other sites were found to have begun after the numbers of sea lions migrating into the Northwest increased. At the Ballard Locks, for example, the occurrence of sea lions was rarely observed until the early 1980s when the seasonal sea lion population increased in Puget Sound. Studies conducted at the Ballard Locks on the California sea lion-steelhead conflict indicate that predation at this site in spite of deterrence appears to be a "learned" behavior.

Comment 60. Pinniped issues should not be viewed solely from the perspective that pinnipeds are competing for fisheries resources and therefore must be "managed" to ensure optimized economic yield for fisheries. NMFS should reevaluate the fishery management allocation system and consider providing an allocation to predators whose survival is more inextricably linked to that fishery resource.

Response. The recommendations are based on an ecosystem view that provides for the MMPA goal of achieving and maintaining OSP for all marine mammals. Management of pinnipeds becomes appropriate for consideration when resource conflicts involving a few individual animals can be resolved by removing the involved pinnipeds. The recommendations are not for a pinniped population reduction program to benefit fisheries. In regard to fisheries management, predator

(mammals, seabirds, other fish, etc.) removals of fish species are included in stock assessments as natural mortality.

Comment 61. Interaction problems including health and safety concerns and damage to gear and catch were resolved by the 1994 MMPA Amendments which provided greater flexibility for dealing with these problems without the necessity for lethal removal. NMFS should continue to use the existing authorizations in the MMPA, such as Section 120, until significant impacts by pinnipeds can be demonstrated, and prohibitions on intentional shooting marine mammals should be strictly enforced.

Response. The 1994 Amendments to the MMPA prohibited the intentional lethal taking of pinnipeds interacting with commercial fishing operations; the non-lethal measures used by fishers were not affected. Discussions among NMFS, PSMFC and state representatives included the provisions of Section 120 and their implementation at Ballard Locks. In those discussions, participants stated that the process was too complex and extensive to be effective in the most critical situations.

Comment 62. The first trial of the Section 120 authorization process (the Ballard Locks sea lion-steelhead interaction) is an insufficient basis upon which to recommend that Congress amend this process and create a blanket authorization to the States for lethal removal authority. This one trial does not justify characterizing the Section 120 process as cumbersome and restrictive. The Section 120 authorization process provides both the flexibility to conserve salmonid stocks while requiring the necessary burden of proof the pinnipeds are indeed having a significant negative impact on the decline or recovery of salmonid fishery stocks. NMFS and the West Coast states should work with the conservation community to reevaluate the process and develop means, that do not involve changing the law, to make Section 120 more responsive and effective.

Response. The Section 120 process was designed to address the situation at the Ballard Locks (i.e., the Ballard Locks are directly cited in the law). In spite of over 10 years of data and observations on the affects on the steelhead population by a few sea lions, a number of groups have disagreed that the data are sufficient to demonstrate that sea lions are having significant negative impacts on the status and recovery of steelhead and have litigated. The State of Washington, as the applicant and recipient of the authority, found the process to be cumbersome and unnecessarily restrictive. The recommendations are designed to provide a more streamlined process that would allow immediate authority for resource agencies to take action where necessary.

Comment 63. The report does not correctly describe the intent or usefulness of Section 120 to effectively conserve salmonid populations. First, the provisions of Section 120 were specifically included in the MMPA in recognition of the importance of conserving salmonid populations. Second, the provisions do not require perfect or largely unobtainable information as evidenced by the fact that information provided in the Ballard Locks situation was sufficient for NMFS to authorize lethal removal in that instance. Thirdly, Section 120 is precautionary and does not require that salmonid populations be driven to an ESA listing before action can be taken.

Response. The Section 120 process requires a finding that individually identifiable pinnipeds are having a significant negative impact on the status or recovery of a salmonid population that is

listed as threatened or endangered under the ESA, or approaching such status, or that migrate through the Ballard Locks. As illustrated by the process for the Section 120 authorization issued for sea lions at the Ballard Locks, a large body of data collected over a number of years, including considerable effort identifying individual pinnipeds and a substantial monitoring program, may be needed to support an appropriate finding under Section 120.

Comment 64. State and federal resource managers have broad authority pertaining to lethal and non-lethal removal of nuisance animals. The MMPA allows lethal removal of nuisance animals for human health and welfare concerns. Neither NMFS nor state agencies are in need of additional authority under the MMPA.

Response. The MMPA does not provide for the lethal removal of nuisance animals and currently does not provide sufficient authority for resource agencies to respond quickly to resource conflicts, which may involve immediate action to protect ESA-listed species.

Comment 65. The proposed action would eliminate the safeguards contained in the MMPA by eliminating the evidence needed to prove that a lethal take will actually benefit salmonids. The lack of research funding to collect this evidence does not negate its biological importance.

Response. The lethal removal authorizations recommended include safeguards for pinnipeds including a limitation on takes to ensure that all human removals are below PBR levels and specific conditions on the use of this authority to ensure that removals would benefit salmonids.

Comment 66. The report has presented an unbalanced view of the economic impact of pinnipeds. If economic impacts are to be included as part of the ecosystem impacts, then reference should be made to tourism revenues generated by pinnipeds in coastal areas benefited by their presence.

Response. The report focuses on negative pinniped interactions because they are the problems for which Congress requested input and recommendations.

Comment 67. The report indicates that the 1994 MMPA Amendments, which established a regime to govern the incidental take of marine mammals in commercial fishing, could be used to allow lethal removals of pinnipeds for management purposes if such takes have no adverse biological effect on the population. This is an incorrect interpretation of the Amendments. The 1994 Amendments address the incidental take of marine mammals in the course of commercial fishing, not the direct lethal take of pinnipeds for management purposes.

Response. Although Section 118 applies only to the taking of marine mammals incidental to commercial fishing operations, Congress could extend the PBR approach to other sections of the MMPA. PBR is defined and calculated as the maximum number of animals, not including natural mortalities, that may be removed from a marine mammal stock while allowing that stock to reach or maintain its OSP. Therefore, if the total human-caused mortality for a stock subjected to lethal management actions were below PBR, then such taking would not prevent that stock from reaching and maintaining OSP levels. NMFS recommends that Congress consider the use of PBR as a biological standard to limit lethal removals of California sea lions and Pacific harbor seals. Lethal removals would be restricted to certain situations involving conflicts with depleted salmonid stocks

or human activities, as explained in the report. Even with expanded lethal removal authority, it is very unlikely that removals from all sources would approach PBR levels for these pinniped stocks. Nonetheless, NMFS recommends that this biological standard be extended to apply to lethal removal situations to ensure that the recommended lethal removals would not interfere with the stock's ability to achieve or maintain OSP.

Comment 68. Section 118 of the MMPA, which governs incidental take of marine mammals in fisheries, contains as a goal, the reduction of incidental mortality and serious injury of marine mammals taken in the course of commercial fishing operations to insignificant levels approaching a zero mortality and serious injury rate. NMFS cannot achieve the "zero mortality rate goal" (ZMRG) if it permits the lethal removal of pinnipeds

Response. Under Section 118, the ZMRG must be reached by the year 2001 and applies to serious injury and mortality of marine mammals incidental to commercial fishing operations. Because intentionally killing marine mammals in the course of fishing operations is currently prohibited, NMFS believes that such incidental serious injury or mortality includes only accidental taking. The MMPA does not apply this goal to other types of takings, such as directed takes. In addition, the MMPA does not define ZMRG quantitatively nor give consistent guidance on an interpretation of what constitutes an insignificant level of mortality or serious injury. NMFS is still evaluating precisely how this term should be defined and applied. Moreover, NMFS recognizes there are some situations in which removals of individuals pinnipeds from a robust and increasing population would be justified even if the removals might not be insignificant, provided that in all cases the removals would not exceed PBR over an extended period. Those situations are summarized in this report. If the recommendations are adopted, Congress may want to consider the scope of situations to which the ZMRG would apply.

Comment 69. Research and development are necessary for non-lethal deterrent measures that are not injurious and do not have detrimental incidental effects. Pinniped deterrence devices should be a research priority and receive adequate funding. In the interim, however, lethal removal should not be considered the only effective alternative because existing deterrent devices have limited or short term effectiveness.

Response. The recommendation is for development of effective non-lethal deterrents. However, in the interim, there is a need to address site specific problems caused by individual pinnipeds that do not respond to existing non-lethal methods.

Comment 70. The recommendation gives fishers *carte blanche* to systematically eliminate any pinniped they deem fit to destroy because there is little chance of enforcement and plenty of opportunity for abuse. The proposal could result in an open season for harbor seals by fishers instead of controlled taking of problem animals at river mouths by state officials who know the difference between species.

Response. NMFS' 1992 legislative proposal included a provision to continue the authority for lethal removal, as a last resort, only to certain fisheries where there is a demonstrated need and a finding that use of such methods could be monitored and would not be abused.

Comment 71. Lethal removal of pinnipeds will have negative impacts on the ecosystem because of the potential benefits that pinnipeds have on fish stocks due to their role in the food web.

Response. The number of pinnipeds that may be lethally removed would be well below the PBR for each species thereby allowing the populations to continue to increase to their OSP level and remain viable components of the ecosystem.

Comment 72. Lethal removal should not be recommended because this level of management is scientifically unsound, giving unfair and disproportionate bias toward fishing interests. The lethal removal recommendation does not adequately represent those citizens who do not believe that individual animals from non-threatened populations are expendable. Even though harbor seals and California sea lions are not threatened or endangered, individual animals and site specific sub-populations are important to the public and possibly to the ecosystem.

Response. The recommendations address a number of resource conflicts. One of the principal conflict issues that is of concern to the overall general public, not just the fishing industry, is the affects of pinniped predation on depressed salmonids that are listed or proposed for listing under the ESA. Many management decisions are not scientific decisions; rather, they reflect the values of society. NMFS bases its management decisions on sound science; however, some risk-averse management decisions must be made even when little scientific information is available. The recommendations are based upon the PBR approach to ensure that pinniped stocks are not adversely affected, and this approach is well supported by sound science.

Comment 73. There is insufficient data to adequately determine historic "highs" for populations of harbor seals and California sea lions. These populations are known to have been reduced by commercial harvests, bounty programs, etc., earlier this century. The "dramatic" increases in numbers of California sea lions and harbor seals on the West Coast represent recovery of heavily exploited populations and are not indicative of historically high levels.

Response. NMFS agrees that historic data are lacking. However, sea lion remains recovered from middens on the Channel Islands indicate that the species were exploited well before this century. The Scientific Investigation Report indicates that the populations have increased substantially and their range has expanded since passage of the MMPA in 1972. Current population numbers are higher than ever recorded, and many human-pinniped conflicts have occurred concurrently with this increase.

Comment 74. Comparing "nuisance" pinnipeds to deer and bear is a flawed comparison because it has not been scientifically demonstrated that pinnipeds are over-abundant, or that over-abundance is jeopardizing the health of the pinniped population thus requiring management action.

Response. The comparisons to deer and bear relate to wildlife management measures used with "nuisance" terrestrial mammals, not over-abundance. Individual terrestrial mammals are regularly removed from conflict situations, and in situations where these mammals continually return, they may be killed as a part of routine management measures.

Comment 75. A number of members of the Ballard Locks Pinniped-Fishery Interaction Task Force did not agree that the available data supported the assertion that sea lion predation has exerted a significant negative impact on the Lake Washington steelhead population.

Response. Based on the best scientific information available from over 10 years of studies at the Ballard Locks, NMFS has determined that California sea lions have had significant negative impact on the status and recovery of the Lake Washington winter steelhead population. The Ballard Locks Pinniped-Fishery Interaction Task Force agreed with this finding and recommended lethal removal of California sea lions at the Ballard Locks with conditions. A minority of the Task Force did not agree with the recommendation for lethal removal.

Comment 76. The example of sea lion foraging at the Willamette Falls is another case involving a few individual animals at a man-made barrier. This situation may fit the Ballard Locks model, but the Ballard Locks is more likely an exception rather than the rule. Interactions are more likely to occur at river mouths where very little research has been conducted to document predation levels, impacts, or assess the effectiveness of non-lethal deterrents.

Response. The vulnerability of salmonids to pinniped predation at barriers and other sites where fish passage is impeded is addressed in the report. Many river mouths are identified as sites of co-occurrence of pinnipeds and salmonids, and further research at these sites is recommended. However, risk-averse management requires that actions are taken before scientific certainty is achieved especially when dealing with salmonids approaching listing under the ESA.

Comment 77. The lethal take of harbor seals from the San Francisco Bay regional population may seriously impact a population that is struggling to maintain viability. Radiotelemetry studies indicate only limited exchange between harbor seals in the Bay and nearby coastal seal populations.

Response. NMFS disagrees that harbor seals inhabiting San Francisco Bay are a separate population or stock under the MMPA. The NMFS Stock Assessment Reports, which consider genetic uniqueness and other factors in determining populations or stocks, list one California population of harbor seals. Although harbor seal movements between some sites may be minimal, that factor by itself is not sufficient for a scientific determination of a population or stock.

Comment 78. The finding that depressed salmonid populations at some sites could continue to decline due to pinniped predation, even if other sources of mortality may have been curtailed is purely hypothetical. With the exception of the Ballard Locks, it has not been determined that pinnipeds have had a significant negative impact on any wild salmonid population. Therefore, to state that an impact which may not exist is expected to continue is speculative.

Response. The Scientific Investigation Report indicates that pinniped predation can adversely affect small, depressed salmonid populations. The intent of the recommendations is to provide a risk-averse approach to dealing with pinniped-salmonid conflicts and rather than waiting for definitive proof that an impact has occurred before taking action to protect and recover depressed salmonid populations.

Comment 79. There are no quantitative assessments of pinniped impacts on the West Coast aquaculture industry upon which to base the contention that the industry is being negatively impacted. When such an assessment was made by the Gulf of Maine Aquaculture-Pinniped Task Force, they concluded that fish farms in Maine had not taken adequate precautions to exclude pinnipeds. It is possible that a review of practices on the West Coast would reach similar conclusions.

Response. Information in the Scientific Investigation Report from salmon aquaculture facilities in the Northwest indicated that such facilities were experiencing economic losses due to pinniped attacks on net pens. Several facilities invested in predator nets, but damage has continued.

Comment 80. It is premature to recommend killing pinnipeds without funding the studies necessary to identify non-lethal solutions to the problems of concern.

Response. A number of non-lethal deterrents have been tested on California sea lions at the Ballard Locks, and none were found to be totally effective over the long term. The recommendations do include further testing on non-lethal deterrents and lethal removal would be authorized only until such time that effective non-lethal deterrents are developed.

Comment 81. In regard to non-lethal deterrents, the report states that some sea lions have "learned" to tolerate or avoid the effects of "all" deterrent devices. There is no evidence to support this, particularly in the case of underwater explosive devices (seal bombs). Some salmon growers in Maine choose not to use seal bombs because of concerns about consequent deafness making seals unresponsive to other acoustical deterrents.

Response. Observations of California sea lions at the Ballard Locks indicate that some sea lions did "learn" to tolerate or avoid deterrence efforts. Although there were concerns over the use of firecrackers causing sea lions to go deaf, several sea lions that were exposed to underwater firecrackers were subsequently observed with no apparent hearing impairment.

Comment 82. A Masters Thesis study "The Foraging Ecology of Harbor Seals, *Phoca vitulina*, and California sea lions, *Zalophus californianus*, at the Mouth of the Russian River, California" does not support the view that predation by seals was a serious threat to steelhead and salmon populations, making lethal action unnecessary.

Response. The Masters Thesis by Hanson (1993) documented food habits of harbor seals based upon collection of 155 scat over a years time. She reports frequency of occurrence ranging up to 20% salmonids during winter. Most of the predation was reportedly on hatchery fish. Lethal removal of seals and sea lions is not proposed to protect hatchery stocks, rather it is recommended when pinniped predation may inhibit recovery of seriously depleted wild or ESA-listed stocks. Hanson reported that in 213 hours of observation, 56 adult salmon were observed captured and consumed by pinnipeds (0.26 salmon per hour of observation). The data and results of this study were considered and cited in the Scientific Investigation Report, which concluded that pinniped predation could retard the recovery of endangered salmonids.

Comment 83. The recommendations are made without demonstrating consideration of the intricacies of sea lion ecology, except as a predator. The report should be expanded to include a multi-species assessment rather than focusing only on pinnipeds.

Response. The recommendations are based upon the conclusions of the Scientific Investigation Report in which it was concluded that in most instances it is small numbers of individual male sea lions which have learned to exploit the concentrations of returning adult salmon that are likely to cause impacts on endangered salmonids in river systems along the West Coast. This means that the majority of the California sea lion population conducts itself as a healthy population contributing to the health and stability of the coastal marine ecosystem. The assessments are limited to California sea lions and Pacific harbor seals because those are the species which have been implicated in potentially severe interactions with salmonids on the West Coast. Multi-species assessments were for this reason not undertaken.

Comment 84. The Mangel et al. principles of wildlife conservation cannot be cited at all when the primary threats to fisheries are not being addressed by NMFS, and non-lethal alternatives are not being reasonably explored. The one relevant principle from Mangel et al., requires that conservation management "avoid disruption of food webs, especially removal of top or basal species."

Response. The second principle included in Mangel et al. states that we must secure present and future options by maintaining biodiversity at several levels. The recommendation for site specific management is consistent with this principle and with the precautionary principle, both of which are sound principles of wildlife management. The precautionary principle maintains that uncertainty should benefit the resource. Which is a greater risk to biodiversity, the removal of a few individual pinnipeds from stocks from abundant, robust populations or the removal of a few individuals from the critically depleted salmonid run? In the case of California sea lions and Pacific harbor seals preying upon critically depleted salmonid runs, NMFS believes that salmonids are the resource that should be favored in the face of uncertainty.

Comment 85. The 1994 MMPA Amendments called for an investigation into whether pinnipeds are having broader impacts on the coastal ecosystem on the West Coast. This was clearly intended to require a review on the affects of pinnipeds on marine biodiversity and health of the marine habitat, not on private property (docks and piers, etc.), which was a focus of the report. The issues of pinniped interactions with humans, human activities and property were resolved during the 1994 reauthorization.

Response. The Scientific Investigation Report reviewed pinniped interactions with ecosystems, and ecosystems are interpreted to include humans and human activities such as fishing. The 1994 Amendments to the MMPA expanded the authority for non-lethal deterrence to private citizens, but this did not resolve the problems concerning the effectiveness of deterrence measures identified in the Scientific Investigation Report.

Comment 86. Data from "lethal" food habits research is not critical and should be stricken from the report unless substantiating data for use of this technique is included.

Response. Lethal food habits research methods have many advantage over indirect methods such as scat analysis which is the method most commonly used today. The collection of animals for food habits studies allows for assessment of all the food types which an animal has eaten, not just those which have hard parts which pass through the digestive tract. It also allows for quantification of the volume of pinniped meals which is needed to estimate the amount of food consumed by a population of animals. It is a scientifically valuable method of studying food habits.

Comment 87. As a result of the increasing number of pinnipeds, a resident harbor seal colony of 50 seals now resides at Children's Pool Beach (CPB) in La Jolla, California, which was created specifically to allow children to learn to swim and snorkel. As a result, children are not utilizing CPB as often as in the past.

Response. Although for several decades harbor seals have hauled-out at Seal Rock near downtown La Jolla, California, for the past four years, harbor seals have also been using nearby CPB as a haul-out. Over 140 harbor seals were observed on CPB in June 1996. The City of San Diego closed the beach to swimming in September 1997 due to high counts fecal coliform bacteria. The City of San Diego is investigating whether seals are responsible for the contamination at CPB. If the seals are responsible for the high bacterial counts, the City of San Diego may initiate non-lethal measures under current provisions of the MMPA to deter the animals from hauling-out at CPB. Under the recommendations, non-lethal measures must be attempted before lethal options could be considered.

Comment 88. There are concerns about personal safety while swimming and body surfing near La Jolla Cove because of the "over-population" of seals. The scent of seals and sea lions is bait for sharks and killer whales. Furthermore, killer whales have been observed feeding on seals in Boomers Beach just north of CPB and great white sharks have been reported in La Jolla.

Response. A goal of the MMPA is that marine mammal populations achieve or maintain their OSP level and the recommendations do not alter that. At this time, the harbor seal population in California has not been determined to be at OSP. Although there have been a number of media reports that increased attacks on humans by the great white shark are related to increased numbers of pinnipeds in coastal areas, there is little scientific information on this issue.

Comment 89. Blaming logging, farming, fishing, etc. for the decline of salmon without controlling the over-population of pinnipeds will cause the recovery program to all be in vain.

Response. NMFS agrees that a salmon recovery program must address all factors, and the recommendations provide a means to address pinniped predation to complement other efforts. The report, however, does not recommend a pinniped population control program.

Comment 90. Removal of pinnipeds in Oregon and Washington would not remedy the salmonid-pinniped crisis unless similar measures were adopted in British Columbia, Canada.

Response. The recommendations apply only to site-specific situations on the West Coast of the U.S. The recommendations do not apply to altering the overall population of pinnipeds and, therefore, would have no direct effect on pinniped movements into Canada. However, it should be

noted that the Canadian government has undertaken lethal removal measures to resolve site-specific pinniped conflicts with salmonids in the Puntledge River in British Columbia.

Comment 91. Research into pinniped interactions is needed, but too often an issue is studied to death, delaying action on the issue.

Response. Research on pinniped conflicts is needed, but completion of such research would not be a prerequisite to the recommendations for undertaking necessary actions to address existing pinniped conflict situations. The recommendations acknowledge that sufficient information is available to warrant action to address pinniped conflicts in certain situations.

Comment 92. NMFS should submit the recommendations report as written, and indicate to the Congress the major economic consequences that will befall the West Coast recreational and commercial fishing industries if Amendments to the MMPA are not implemented to recognize and address the robust population of pinnipeds that now exist in California and along the entire West Coast.

Response. The substance of the report remains as proposed. Changes in the final version clarify specific points and would require that site-specific management measures would apply only if (1) salmonid conservation or recovery plans are in place or in development, (2) recovery efforts on other factors affecting salmonid status are underway, and (3) the removal of pinnipeds is consistent with salmonid conservation/recovery plans.

Comment 93. Recommendations for lethal removal are unnecessarily inhumane, potentially harmful to the public. If firearms are used, there could be danger to the public or other fishers in the area. Indirect risks include an increase of carcasses on public and private beaches and distress to private citizens.

Response. Any undertaking of lethal removal would be conducted as humanely as possible. Taking by state or federal resource agency officials would be immediately recovered and the carcasses used for science. Authorizations to commercial fishers would be restricted to minimize the potential for carcasses washing-up on beaches.

Comment 94. In most cases, reduction of pinniped predation by itself will not bring about the recovery of depressed salmonid stocks. The full range of factors that have brought about the decline of salmonid stocks (and may be impeding their recovery) must be identified and addressed to achieve recovery within a reasonable time frame.

Response. NMFS agrees.

Comment 95. Sea lions or seals should be killed only in cases where animals are a threat to human life.

Response. The MMPA does provide an exception to the moratorium on taking of marine mammals in situations where the taking is imminently necessary in self defense or to save the life

of a person in immediate danger. However, NMFS does not agree that this is the only situation where lethal removal of sea lions or seals may be necessary. See response to comment #4.

Comment 96. Before 1994, when fishers were allowed to use lethal means to protect their gear and catch, sea lions and seals continued to increase at a healthy rate. Therefore, reinstating the right to lethally remove pinnipeds would not impact the pinniped populations. Furthermore, this would reintroduce a learned behavior (fear of man) that would tend to keep pinnipeds away from fishing activities.

Response. NMFS agrees that pinniped populations increased through the years that fishers had authority to lethally take marine mammals as a last resort. Thus, the recommendation is for consideration of reinstatement of the authority to fishers. However, the authority would not be broad-based, only selected fisheries would have such authority, and only if there is a demonstration of economic impacts from pinnipeds.

Comment 97. The report mischaracterizes the views of the Pacific Scientific Review Group (PSRG) when it indicates that the Group identified the impact of pinniped predation on the decline or recovery of certain salmonid populations, as a major issue for management of pinniped interactions with various fisheries and fish stocks. In the "1996 Draft U.S. Pacific Marine Mammal Stock Assessments" the PSRG stated that increased predation on salmonids by increasing numbers of California sea lions may affect recovery of depressed salmonid population and may be one of the causes of decline in some populations.

Response. The stock assessment document and the statement on increased predation by California sea lions was prepared by NMFS, not the PSRG. The PSRG view on pinniped predation was expressed in PSRG meetings and is correctly characterized in the report. Also, the PSRG advised NMFS by letter of its support of three of the recommendations in the draft report, including site specific management, developing deterrence technologies, and additional research on pinniped effects on salmonids and the ecosystem.

Comment 98. NMFS should work with the respective resource management agencies, using the PSMFC as an interagency liaison, to secure adequate funding from Congress to carry out the described activities and recommendations.

Response. The FY98 appropriations include new funding for studies on the impacts of California sea lions and harbor seals on salmonids and West Coast ecosystems. NMFS will work with PSMFC and the states in implementing a program for these studies.

Comment 99. Commercial and recreational fishers have lost catch to pinnipeds in many areas along the West Coast. Pinnipeds have been reported to take fish off lines, follow boats, attack nets, and damage crab pots in many areas including Monterey Bay, Umpqua River estuary, San Francisco/Half Moon Bay, Cowlitz River, Alsea River, and Yaquina Bay.

Response. These observations are consistent with the information in the Scientific Investigation Report.

Comment 100. Pinnipeds have been observed consuming salmonids in many areas throughout the West Coast including the Columbia River, Ballard Locks, San Lorenzo River, the mouth of Siletz Bay, Nehalem River, Siuslaw Bay, Alsea Bay, Yaquina Bay, and Lower Umpqua River. The evidence of pinniped predation (tooth and claw marks) has been observed on fish passing through fish ladders at Winchester Dam, Willamette Falls, and Ballard Locks.

Response. These observations are consistent with the information in the Scientific Investigation Report.

Comment 101. Once data on levels of predation are known, predation should be compared with impacts of other user groups, including commercial and recreational fishers, dam operations, silviculture, and agriculture practices. Actions should be developed to mitigate the decline of salmonid stocks by all sources.

Response. NMFS agrees that all sources affecting recovery of salmonids must be addressed. Comparisons of relative contributions of various recovery efforts will be conducted when data and models for such are available.

Comment 102. The terms "healthy" and "robust" should not be used to describe pinniped populations until the prevalence of disease in these populations is better documented and the potential contributions of human activities to the incidence of marine mammal diseases are better understood.

Response. The terms are appropriately used as they apply to the status of the population and not the condition of individual animals. Additionally, NMFS recognizes that individuals within populations that are at the upper end of OSP (near carrying capacity) may be diseased; in fact, disease may be one of the mechanisms by which nature limits population growth. Such a population, however, would be considered healthy and robust relative to its OSP.

Comment 103. NMFS should submit the report to Congress as soon as possible so that Congress can act on this issue promptly. Congress needs to recognize the significant impact pinniped predation is having on salmonid populations and authorize the recommendations.

Response. This report will be submitted in time for Congress to consider it in the reauthorization of the Marine Mammal Protection Act in 1999.