

## **2.0 ALTERNATIVES**

### **2.1 Introduction**

This chapter describes the range of potential alternatives determined reasonable to meet the purpose and need of the proposed action to disperse federal funds and issue permits for research on Steller sea lions (SSLs) and Northern fur seals (NFSs). This chapter also summarizes how the alternatives would achieve the purpose and need as defined in Chapter 1. National Marine Fisheries Service's (NMFS) evaluation of the potential environmental impacts of the alternatives is summarized in Chapter 4.

The Council for Environmental Quality (CEQ), created under Title II, Section 202 of the National Environmental Policy Act (NEPA) (42 United States Code [U.S.C.] 4332), is responsible for the development and oversight of regulations and procedures implementing NEPA. The CEQ regulations provide guidance for federal agencies regarding NEPA's requirements (40 Code of Federal Regulations [CFR] Part 1500), and require agencies to identify processes for issue scoping, consideration of alternatives, developing evaluation procedures, involving the public and reviewing public input, and coordinating with other agencies—all of which are applicable to NMFS' development of the SSL and NFS research alternatives.

In keeping with CEQ requirements for implementing NEPA, this Programmatic Environmental Impact Statement (PEIS) offers a reasonable range of alternatives, including the No Action Alternative, and a discussion of the environmental impacts of activities associated with each alternative. Each alternative is based on a distinct philosophy and management approach, but all are consistent with NMFS statutory and regulatory responsibilities for conservation and recovery of the species.

This PEIS presents a spectrum of alternative policies for facilitating SSL and NFS research ranging from a "hands-off" policy that limits the scope of research and collection of scientific information to methods not requiring capture or handling of animals to a "maximum" policy that does not limit the scope of research or methods used to collect scientific information. Within this spectrum of alternatives is the Status Quo alternative, which is characterized by the levels and types of research that were funded and permitted at the start of the PEIS process. Although many of the permitted activities within the Status Quo alternative were suspended subsequent to initiation of this PEIS, when certain permits were vacated by court order on May 26, 2006 (Civil Action No. 05-1392 ESH), the scope of research authorized prior to the court order represents a baseline with which to compare each alternative.

The impacts of the alternatives are evaluated based on information on the resources, as summarized in Chapter 3 (Affected Environment), and the analyses are presented in Chapter 4 (Environmental Consequences). The analyses provide the basis for decision-makers to evaluate each alternative and to ultimately choose a preferred alternative.

#### **2.1.1 Relation of Alternatives Evaluated to the Statement of Purpose and Need**

The range of alternatives evaluated in an EIS must achieve the objectives of the proposed action as stated in the statement of purpose and need, without violating any of the minimum environmental standards mentioned in Chapter 1. The purpose and need also helps determine which alternatives are carried forward for analysis in the EIS. An alternative that does not satisfy at least some of the agency's purpose and need, or would not meet minimum environmental standards, is not considered reasonable and need not be carried forward for evaluation in the EIS. An alternative cannot be dismissed from further analysis arbitrarily; justification must be provided for elimination of an alternative from further consideration.

## 2.1.2 Relation of Alternatives to the Recovery and Conservation Plans

Recovery and conservation plans outline information needs and, in some cases, specify research activities, determined by NMFS to be essential to conservation of a species. The 1992 SSL Recovery Plan and the 1993 NFS Conservation Plan have played important roles in guiding past research on these species. In 2006, NMFS released draft revised plans for both species (NMFS 2006a and 2006b) that will help guide research in the future. The purpose and need for future research on SSLs and NFSs is based on the purposes and policies of the Marine Mammal Protection Act (MMPA) and the Endangered Species Act (ESA) as they relate to conservation and recovery of these protected species.

In general, research permits for takes of any ESA-listed species must be justified by the likelihood of contributing to the species' recovery. Similarly, research permits for takes of marine mammals must only be issued for research reasonably likely to achieve the objectives of the MMPA. Through regulations, NMFS requires that applicants for permits for research on marine mammals listed as depleted, threatened, or endangered demonstrate how the results of their proposed research would directly benefit that species or would fulfill a critically important research need. For those species which have recovery or conservation plans, such as SSLs and NFSs, applicants can most easily satisfy this requirement by demonstrating how the proposed research would contribute to fulfilling a research need or recovery objective identified in the species recovery or conservation plan.

The research priorities listed in the SSL Recovery Plan and the NFS Conservation Plan provided a general framework for tools chosen to structure each of the alternatives analyzed in this document. Chapter 3 of this PEIS describes the old and 2006 draft recovery and conservation plans in more detail (Sections 3.2.1.12, 3.2.1.13, 3.2.2.11, and 3.2.2.12).

## 2.2 Scoping Issues Considered in Developing Alternatives

The first step in preparing an EIS is publishing a Notice of Intent (NOI) in the Federal Register (FR). On December 28, 2005, the NOI (70 FR 76780) announcing the preparation of this PEIS was published requesting public participation in the scoping process. In addition to providing background information on the purpose of issuing scientific research permits and providing the statutory requirements for permits that allow research on marine mammals, the NOI also provided a list of issues on which NMFS was seeking public input on. These issues included: 1) types of research; 2) level of research; 3) coordination of research; 4) effects of research; 5) qualifications of researchers; and 6) criteria for allowing modifications or amendments to existing grants and permits; and for suspending or revoking permits. To provide a framework for public discussion, the NOI also presented preliminary concepts for alternatives that could be considered for the PEIS; however, the exact structure and number of alternatives were developed after the scoping process was complete.

Below is a brief summary of the substantive issues raised during public scoping meetings. A more complete summary of formal comments is included in the Scoping Summary Report, included as Appendix C.

### *Alaska Native Issues*

- Discuss environmental justice in the PEIS.
- Discuss the role of Tribal governments in the PEIS and in the decision-making process.
- Present effects of the proposed action on subsistence users.

### *Alternatives*

- Alternatives analyzed in the 2002 and 2005 SSL Permit Environmental Assessments (EAs) were inadequate.
- Comments in support of, or against, alternatives analyzed in the 2002 and 2005 SSL Permit EAs.
- Incorporate suggested alternative components in the PEIS analyses.
- Comments and discussions related to determining a reasonable range of alternatives.

### *Branding/Hot-Branding*

- Hot-branding is an inhumane, intrusive method for marking animals and should not be used; the risks associated with hot-branding outweigh the benefits.
- Branding causes too much disturbance on rookeries and should not be used.
- Effects of hot-branding should be studied further before additional hot-branding is authorized.
- Post-branding monitoring is needed to understand its effects.
- Too many animals are branded each year.

### *Conservation of the Species/Conservation Goals*

- Permitted research should be focused on contributing to the conservation of the species.
- The permitted research activities are not contributing to the conservation of the species.
- Proposed research does not appear to be conducted in a manner that promotes conservation of the species.
- Research objectives should be coordinated with the overall goal of recovering and conserving the species.

### *Coordination*

- There is a lack of coordination among permitted research and it needs to be coordinated.
- NMFS has authorized permits without regard to how they all fit together to answer questions related to recovery and conservation of the species; without such an approach, populations and areas are being over-sampled.
- Research must be coordinated to ensure that methodologies being used are comparable.
- Research needs to be coordinated with the goals in the species recovery and conservation plans.

### *Credentials of Researchers*

- Only veterinarians should administer anesthesia or dart animals.
- Comments related to the qualifications/credentials of researchers conducting certain types of research, particularly invasive research.

### *Cumulative Effects*

- The PEIS should include discussion of the cumulative or synergistic effects of research on the animals.
- Cumulative effects were not addressed in the 2002 or 2005 Steller Sea Lion Permit EAs.
- Research is causing significant adverse cumulative effects on the species.
- The cumulative effects of research exceed the sustainability of the population.
- All permits should be suspended until cumulative effects of research are analyzed.
- Comments related to specific issues that should be included in the cumulative effects analysis.

### *Duplication of Research Effort*

- Due to the lack of coordination of research activities permitted, there is duplication of effort that is harmful to the species.
- Some of the methodologies being used appear duplicative.

### *Editorial*

- Editorial comments regarding text, tables, or figures in the 2002 or 2005 SSL Permit EAs.

### *Effects of Research*

- The effects of the invasive research taking place on these animals needs to be addressed; this should be addressed before any additional permits are approved.
- NMFS has not demonstrated that the effects of research will be insignificant.

- Any given research method can have a wide range of disturbing effects.
- The cruelty of certain types of research is disturbing and lacks justification.
- The effects of administering multiple research methods on the same animal are not well documented and should be analyzed.
- Specific comments on the effects of particular methods being used during research.

#### *Endangered Species Act*

- NMFS cannot meet its burden of proof under the ESA and MMPA to show that this research will clearly benefit the species.
- This research is in violation of the ESA.
- The quality and level of analysis required under the ESA is lacking.

#### *Inadequate Information*

- There is inadequate information to fully understand the effects of research.
- Comments related to inadequate information provided in specific research permit applications (e.g., sampling locations, justification for specific protocols, mortality rates).

#### *Methodology*

- Research methods are inhumane; other methods that are less invasive should be used.
- Research methods are not justified.
- Effects of research methods are not well documented; not enough is known about the effects of certain research methods.
- Research methods should address questions or hypotheses related to the primary research goals listed in the SSL Recovery Plan.
- When there are conflicting methodologies, NMFS should clarify whether or not and how each fits within overall recovery goals.
- A power analysis for research methodologies should be done before any more invasive research is permitted.
- NMFS should create an independent research panel of outside experts to help identify the best methodologies to be used; a workshop that includes outside experts should be organized by NMFS to determine the best methodologies.
- When possible, new invasive methodologies should be tested on non-listed species first.
- Suggestions on specific methodologies and how they should be administered (e.g., only veterinarians should administer anesthesia, researchers working on rookeries should be briefed by biologists on how to minimize impacts).

#### *Mitigation*

- Mitigation measures are not discussed in all permit applications.
- The PEIS should discuss appropriate mitigation measures that should be implemented as part of the proposed action.

#### *Marine Mammal Protection Act*

- NMFS cannot meet its burden of proof under the MMPA to show that this research will clearly benefit the species and that the level of incidental mortality is acceptable.
- NMFS has not conducted the required level of analysis on the effects of research as required under the MMPA.
- Issuing permits for research violates the MMPA; approval of invasive research should be suspended until

a comprehensive evaluation of effects and the contribution to recovery and compliance with the MMPA are demonstrated.

#### *Monitoring*

- NMFS must suspend permits until an adequate monitoring program to evaluate effects of research is in place.
- Monitoring the long-term effects of research (e.g., hot-branding) should be done.
- A monitoring program administered by NMFS should include ways to assess cumulative effects.

#### *Mortality*

- The level of mortality (take) approved by NMFS is unacceptable, particularly for an endangered population.
- Comments expressing concern over the level of mortality described in specific permit applications; the rate of mortality described in some permit applications does not appear to be “insignificant” as NMFS concludes.
- Comments regarding research techniques that should not be used because they result in an increased level of mortality.

#### *National Environmental Policy Act*

- The 2002 and 2005 SSL Permit EAs are inadequate and violate the requirements of NEPA; NMFS Finding of No Significant Impact (FONSI) should be re-examined.
- The quality of analysis of the effects of research, as required under NEPA, is insufficient at this time.
- Preparation of an EIS should be undertaken prior to issuance of permits rather than after the fact.
- Permits and permit modifications or amendments should be suspended until the PEIS is complete.
- Specific comments on what should be included in the SSL and NFS research PEIS; direct, indirect, and cumulative effects should be analyzed in a single NEPA document.
- Though it is analyzing the effects of the grant and permit programs.

#### *Potential Biological Removal*

- The cumulative effect of research activities, when added to other factors, such as Native subsistence harvest, could exceed the Potential Biological Removal (PBR) and is clearly a significant impact.
- NMFS should require researchers to consult on how to reduce incidental mortality to ensure PBR is not exceeded.
- Concern that the cumulative level of take exceeds the PBR for western SSLs.

#### *Permits and Applications*

- Research permits should be carried out under the respective co-management agreements.
- An overall assessment or description of all permit modifications should be developed by the agency so the effects of these permit changes can be understood.
- Permit applicants should be required to identify how their activities address a critical need and justify why certain methodologies must be used, particularly if these are invasive.
- Comments expressing concern over the lack of sufficient information in specific permit applications to adequately assess impacts of research.
- Comments highlighting discrepancies in numbers or information presented in specific permit applications.
- Concerns related to invasive techniques described in specific permit applications.

### *Reporting Requirements*

- Researchers are not doing an adequate job of reporting effects of their research activities to NMFS.
- Comments regarding discrepancies in permit applicant reports.

### *Sample Sizes and Techniques*

- A power analysis should be undertaken to determine appropriate sample sizes, locations, and techniques.
- Specific suggestions for quality control of sample sizes, locations, and techniques used to minimize impacts to SSLs and NFSs; sampling techniques should be coordinated so results are comparable.
- Concerns related to sample sizes, locations, and techniques used for specific types of research; there is an apparent lack of integration and coordination of research for determining appropriate sample sizes, locations, and techniques.

### *Take*

- Researchers increase the level of take each year and the overall effects of this increase are significant.
- The level of take is too high for the population to sustain itself.

### *Welfare*

- NMFS must consider the welfare of individual animals when reviewing permit applications.
- Justification or sufficient information that the techniques used, or the level of take requested, meet the tests of the Animal Welfare Act (AWA) are lacking; each permit application should be able to pass scrutiny of an independent animal welfare/care committee.

A more complete summary of formal comments is included in the Scoping Summary Report, attached as Appendix C. The following table provides general categories of the types of issue raised in the NOI and during the scoping process and where these issues are addressed in the PEIS.

## **2.2.1 Additional Outreach to Inform Development of the Alternatives**

NMFS conducted a series of focus group meetings in July and August 2006 with various agencies, researchers, Alaska Native groups, and other interested parties to discuss the issues raised in scoping and previous NEPA-compliance activities and to further inform the process of developing a reasonable range of alternatives. NMFS used the results of these meetings to further refine management measures that could be used as elements of programmatic alternatives and to finalize the reasonable range of alternatives to be considered in the Draft EIS (DEIS) (Appendix E).

## **2.3 Research Components of the Alternatives**

The legal and regulatory framework for NMFS' responsibilities regarding marine mammals is described in Section 1.7, including the need to monitor, conserve, and promote the recovery of depleted, threatened, and endangered populations under the guidance of their respective recovery and conservation plans. All of the alternatives must meet these research and management needs within the scope of NMFS' legal limits and responsibilities. There is considerable flexibility under the MMPA, ESA, and NMFS regulations regarding the types of research objectives and procedures that can be permitted. If an applicant submits information demonstrating that a requested activity is consistent with the provisions of the MMPA, ESA, and permit regulations, and NMFS determines that issuance of the permit would not violate any other environmental laws, researchers can request and receive authorization for a wide variety of studies and protocols. The overall scope of research efforts permitted on a marine mammal species or stock at any time is dictated by the number and nature of permit applications received. The MMPA and ESA give NMFS authority to place such terms and conditions in research permits as are deemed appropriate. These conditions are typically specific mitigation measures that are required to minimize risk of adverse effects.

**Table 2.2-1**

**Issues Raised in the NOI and Scoping Comments and Where They Are Discussed in the PEIS**

ISSUE	SECTIONS IN THE PEIS WHERE ISSUE IS DISCUSSED
<b>Issues Identified in the NOI</b>	
Types of Research	2.4.2 Components Common to All Alternatives; 2.6 Alternatives Carried Forward for Analysis; 3.2.1 Steller sea lions; 3.2.2 Northern fur seals; Chapter 4 Environmental Consequences; Appendix A Description of Active Permits; Appendix B Description of Research Methodologies
Level of Research	2.6 Alternatives Carried Forward for Analysis; 3.2.1.11 Past Research, Levels of Effort, Funding and Program Histories Chapter 4 Environmental Consequences; Appendix A Description of Active Permits
Coordination of Research	3.2.1 Coordination of Research; 3.7 Grant and Permitting Process; 4.7.2 Coordination; 5.3 Recommendations for Coordination of SSL and NFS Research
Effects of Research	2.3 Research Components of the Alternatives; 4.8 – 4.11 [Environmental Consequences of the Alternatives on Selected Resources]; Appendix B Description of Research Methodologies
Qualifications of Researchers	4.7.4 Mitigation and Conditions of Grants, Permits, and Authorizations; Appendix D Requirements for Obtaining a Grant or Permit for Research on Protected Species
Criteria for Allowing Modifications or Amendments to Existing Grants and Permits	4.7.4 Mitigation and Conditions of Grants, Permits, and Authorizations; Appendix D Requirements for Obtaining a Grant or Permit for Research on Protected Species
<b>Issues Raised in Scoping Comments</b>	
Alaska Native Issues	3.2.1 Steller Sea Lions; 3.2.2 Northern Fur Seals; 3.4.1 Subsistence Harvest; 3.5 Coastal Communities; 4.7.2.3 Coordination Required Under Co-Management Agreements; 4.9 Social and Economic Environment; 5.4 Recommendations for Coordination with Alaska Native Organizations; Appendix F Co-Management Agreements for St. George and St. Paul Islands
Alternatives	2.6 Alternatives; 4.7 Elements Common to All Alternatives; 4.8 – 4.11 [Environmental Consequences of the Alternatives on Selected Resources]
Branding/ Hot Branding	2.3 Research Components of the Alternatives; 3.2.1 Steller Sea Lions; 4.8 – 4.11 [Environmental Consequences of the Alternatives on Selected Resources]; Appendix B Description of Research Methodologies
Conservation of the Species/ Conservation Goals	1.2 Purpose and Need for Action; 3.2.1 SSLs; 3.2.2 NFSs; 4.8 – 4.11 [Environmental Consequences of the Alternatives on Selected Resources]
Coordination	3.2.1 Coordination of Research; 3.7 Grant and Permitting Process; 4.7.2 Coordination; 5.3 Recommendations for Coordination of SSL and NFS Research
Credentials of Researchers	4.7.4 Mitigation and Conditions of Grants, Permits, and Authorizations; Appendix D Requirements for Obtaining a Grant or Permit for Research on Protected Species
Cumulative Effects	4.5 Steps for Identifying Cumulative Effects; 4.8 – 4.11 [Environmental Consequences of the Alternatives on Selected Resources]
Duplication of Research Effort	3.2.1 Coordination of Research; 3.7 Grant and Permitting Process; 4.7.2 Coordination; 5.3 Recommendations for Coordination of SSL and NFS Research

**Table 2.2-1 (continued)**

**Issues Raised in the NOI and Scoping Comments and Where They Are Discussed in the PEIS**

ISSUE	SECTIONS IN THE PEIS WHERE ISSUE IS DISCUSSED
Editorial Comments	Editorial Comments Made During Scoping Related to the 2002 and 2005 EAs on the Effects of NMFS Permitted Scientific Research Activities on Threatened and Endangered SSLs and are not applicable to this PEIS.
Effects of Research	4.8 – 4.11 [Environmental Consequences of the Alternatives on Selected Resources]; Appendix B Description of Research Methodologies
Endangered Species Act	1.2 Purpose and Need for Action; 1.7 Federal Laws Applicable to SSL and NFS Research; 2.1.2 Relation of Alternatives to the Recovery and Conservation Plans; 1.9 Federal Permits, Licenses and Entitlements Necessary to Implement the Proposed Action; 3.2.1 Steller Sea Lions; 3.2.4 Other ESA-Listed Species; 4.8.4 Other ESA-Listed Species
Inadequate Information	4.3 Incomplete and Unavailable Information; Section 5.3.3 Monitoring Effects of Research
Methodology	Appendix B Description of Research Methodologies
Mitigation	4.7.4 Mitigation and Conditions of Grants, Permits, and Authorizations; Appendix B Description of Research Methodologies; Appendix E Requirements for Obtaining a Grant or Permit for Research on Protected Species
Marine Mammal Protection Act	1.2 Purpose and Need for Action; 1.7 Federal Laws Applicable to SSL and NFS Research; 2.1.2 Relation of Alternatives to the Recovery and Conservation Plans; 1.9 Federal Permits, Licenses and Entitlements Necessary to Implement the Proposed Action; 3.2.5 Other Marine Mammals; 4.8.5 Other Marine Mammals
Monitoring	4.7.5 Monitoring; 4.7.4 Mitigation and Conditions of Grants, Permits, and Authorizations; Section 5.3.3 Monitoring Effects of Research; Appendix D Requirements for Obtaining a Grant or Permit for Research on Protected Species
Mortality	2.5 Establishing Serious Injury and Mortality Limits Under the Alternatives; 4.8 – 4.11 [Environmental Consequences of the Alternatives on Selected Resources]
National Environmental Policy Act	1.2 Purpose and Need for Action; 1.5 Related NEPA Documents that Influence the Scope of this PEIS; 1.7 Federal Laws Applicable to SSL and NFS Research;
Potential Biological Removal	2.5 Establishing Serious Injury and Mortality Limits Under the Alternatives; 4.4.1 Impact Criteria for SSLs and NFSs; 4.8 – 4.11 [Environmental Consequences of the Alternatives on Selected Resources]
Permits, Grants and Applications	3.7 Grant and Permitting Process; 4.7.2 Coordination; 5.3 Recommendations for Coordination of SSL and NFS Research; 4.7.4 Mitigation and Conditions of Grants, Permits, and Authorizations; Appendix A Description of Active Permits; Appendix D Requirements for Obtaining a Grant or Permit for Research on Protected Species
Reporting Requirements	4.7.4 Mitigation and Conditions of Grants, Permits, and Authorizations; Section 5.3.2 Reporting Requirements; Appendix D Requirements for Obtaining a Grant or Permit for Research on Protected Species
Sample Sizes and Techniques	4.8.1 and 4.8.2 Environmental Consequences of the Alternatives on SSL and NFS; Appendix A Description of Active Permits; Appendix B Description of Research Methodologies



**Table 2.2-1 (continued)**

**Issues Raised in the NOI and Scoping Comments and Where They Are Discussed in the PEIS**

ISSUE	SECTIONS IN THE PEIS WHERE ISSUE IS DISCUSSED
Take	2.5 Establishing Serious Injury and Mortality Limits Under the Alternatives; 4.4.1 Impact Criteria for SSLs and NFSs; 4.8 – 4.11 [Environmental Consequences of the Alternatives on Selected Resources]
Animal Welfare	1.2 Purpose and Need for Action; 1.7 Federal Laws Applicable to SSL and NFS Research; 4.8.1 and 4.8.2 Environmental Consequences of the Alternatives on SSL and NFS

NMFS has flexibility in specifying the procedural requirements of grantees that are necessary to ensure sufficient oversight and exchange of information. The Grants Program Office can release funding for a program, but the grantee must send the grant manager proof that the needed permits have been obtained before spending any funds on those activities. In addition, the Grants Program Office defers to NMFS Permits Division, Office of Protected Resources (F/PR1) to establish any mitigation measures required as a condition under the authorized permit.

The procedural and mitigation requirements for research permits under the Status Quo are described in the following sections and in Section 3.7. Variations of and recommendations on these procedures and requirements that could be used are described in Chapter 5. Inclusion of a particular mitigation measure or administrative requirement in a given alternative does not preclude the use of that management tool in a different alternative.

The alternatives vary by management policy, including the types of research and the level of effort that would be permitted under each different policy. The specific research techniques that would be allowed under each alternative are limited only by whether or not an alternative allows capture or handling of animals. For example, under Alternative 2, capture and handling of SSLs or NFSs would not be permitted; research would be limited to activities such as aerial surveys, scat collection or other “hands-off” techniques. Otherwise, the alternatives do not restrict researchers to any specific capture, marking, or sampling methods. The following summary is provided in order to give the reader an idea of what the current research techniques on SSLs and NFSs are, what types of information they provide, and some of the potential risks involved with different procedures. A more detailed account of these procedures and risks is included in Appendix B.

The numbers of animals that would be subject to each procedure under the different alternatives are described in Chapter 4. Currently, not all of the research techniques used on SSLs have been used on NFSs, but there is growing interest (i.e., new permit applications) to implement similar techniques on NFSs. There are likely to be some modifications to procedures used on NFSs, especially for capture and restraint, given the differences between the species. In addition, researchers may develop methods and techniques that have not previously been permitted for either SSLs or NFSs.

**Aerial Surveys:** The purpose of aerial surveys is to obtain photographs from which to count the number of animals present on a rookery (breeding and pupping sites) or haulout (resting sites). Annual counts from many areas and selected “trend sites” are used to estimate population abundance and trends. The protocol currently employed for aerial surveys involves flying over rookeries and haulout sites at slow air speeds (100-150 knots), low altitudes (150-200 meters [m]), and close to shore (500 m), to take color photographs (35 millimeter [mm] slides) and videos (Calkins and Pitcher 1982). Since 2002, some researchers have used medium format color photogrammetry instead of 35 mm slides, which allowed them to count pups and improve counts of non-pups (Fritz and Stinchcomb 2005). The surveys typically include a single pass over each site, with additional passes made only when the photographers have reason to believe they may have missed part of the site. Mitigation used to minimize disturbance of the animals includes provisions to approach rookeries and haulouts from offshore in

straight line flight and to avoid banking maneuvers. Replicate surveys on separate days are occasionally conducted to develop an estimate of the survey variance. Such estimates require multiple surveys at individual sites. Behavioral responses to aircraft range from none to complete and immediate departure from the haulout and stampedes (Calkins and Pitcher 1982, Sweeney 1990). Adults, juveniles, and pups can be injured during stampedes as animals run over each other or slide or crash into cliff facings or underwater rocks in their haste to escape.

**Vessel Surveys:** Marine vessels are used to approach rookeries and haulouts for the purpose of counting young pups, resighting animals tagged and branded by other permit holders, and for documenting behavioral observations. Research vessels may remain within close proximity to a rookery or haulout for up to two to three days at a time. The range of reactions to vessel surveys is similar to that for aerial surveys.

**Ground Counts:** Researchers come ashore during June and July to count young pups because aerial surveys are inadequate to reliably detect pups in some locations. Whenever possible, pups are counted from overlooks or other vantage points to minimize disturbance of rookeries. However, when these methods are unsuitable for accurate counts, or when tissue sampling or marking of animals is also part of the research protocol, adult and juvenile animals are intentionally driven or “spooked” from the rookery into the water in order to facilitate counting pups. The median pupping date in Alaska is June 12; therefore, the majority of pups on a rookery would be a greater than 2 weeks old, depending on the timing of parturition. As with the other surveys, there is a risk of injury and mortality when animals flee the rookery, especially for young pups that cannot get out of the way or are knocked into the water before they can swim. After all or the majority of non-pups have retreated, two or more biologists walk across the rookery, making independent counts of live and dead pups on the beach and in the water. Researchers typically occupy the rookery for approximately two hours for counting, except when a number of pups are captured for weighing, measuring, and collection of tissue samples. In these instances, time on the rookery is determined by the processing time associated with various sampling protocols. After researchers leave, displaced breeding males often need to fight other males to reestablish their territories, resulting in additional chance of injury to males and others nearby. The separation risk of mothers and pups in these situations has not been well studied but may result in mothers failing to locate their own pups, aggression toward pups from other females, or aggression between females who may fight over pups if confused about which pup is theirs. In 2002, some researchers began using a new aerial survey photographic technique, medium format color photogrammetry, which allowed counts of pups as well as non-pups (Fritz and Stinchcomb 2005). This technique provided accurate results compared to traditional drive-counts with essentially no disturbance of the rookery (Snyder *et al.* 2001).

**Scat Collection:** Scat (fecal) collection provides a mechanism for broad estimates of the recent prey consumed, with some limitations and biases (Bigg and Fawcett 1985, Antonelis *et al.* 1987, Harvey 1989). Personnel go ashore on rookeries and haulouts to collect scat samples for dietary studies, which can result in harassment and displacement of SSLs if they are present, but does not require capture. Scat samples are also analyzed for levels of hormones associated with stress and reproduction. Scat collection is typically conducted during ground counts or other research activities on rookeries and haulouts, such that little or no additional harassment results, and may also occur when animals are not present.

**Behavioral and Demographic Observations and Remote Monitoring:** Field teams are stationed at select locations to conduct counts of SSLs and NFSs by sex/age class, conduct studies of attendance patterns of branded, tagged, and naturally-marked animals, record the presence of tagged and branded animals, and record observations of entangled or injured SSLs and NFSs and the presence of other marine mammals and boat or air traffic. Remote monitoring stations are set up on selected islands to collect similar data on seasonal movements and changes in population structure of SSLs and NFSs using still photographs, video images, very high frequency (VHF) telemetry signals, and sonic transmitters. Observations are made from cliffs or other vantage points above rookeries and typically do not result in any takes. Establishing and servicing remote monitoring stations may result in harassment of some animals.

**Capture and Restraint:** It is usually necessary to restrain an animal in order to collect tissue samples, collect morphometric measurements, mark animals, or attach scientific instruments. Conducting physiological examinations, attaching flipper tags, or applying hot-brands can only be performed on animals that are physically or chemically restrained. There are a variety of available capture and restraint methods, depending on the size of the animal and the time of year for capture. After capture, several types of procedures are generally conducted on the animal.

On the rookery, very young pups are caught and picked up by researchers by hand or in a hoop net and may be restrained by gas anesthesia with isoflurane through a mask over the nose. Capture of older/larger animals usually requires the use of a net, trap, or an injectable immobilizing agent such as Telazol (tiletamine-zolazepam) administered remotely by dart. Animals in the water are captured using a hoop net, rope lasso/noose, or floating platform trap. Older animals may be restrained with a “fabric restraining wrap” and use of isoflurane or Valium (diazepam) for sedation. Determining the proper dose of immobilizing agent and anesthesia is dependent on a fairly accurate assessment of the animal’s weight and condition; miscalculation of an animal’s weight can lead to an overdose, which can have lethal consequences (Fowler 1986b).

Mitigation measures in permits include the condition that these procedures be performed or directly supervised by qualified personnel so that the operations go as quickly and efficiently as possible and recommend that an experienced marine mammal veterinarian be present for all use of anesthesia and sedatives. Other provisions describe “best practices” for equipment that should be used, sterile techniques, parts of the body best suited for different procedures, and how to position, monitor, and treat anesthetized animals with an emphasis on animal health and safety over experimental sampling. Special precautions are required for work with lactating females and pups. To the maximum extent practical without causing disturbance of the rookery/haulout, researchers are required to conduct post-handling monitoring of captured or sampled animals for signs of acute stress or injury. Researchers are also required to monitor rookeries/haulouts after disturbance to determine if any animals have been injured or pups abandoned.

Most of the following procedures, when conducted by qualified personnel using best practice techniques, result in small risks of injury to the animal aside from the risks posed by capture and restraint. A variety of somatic, psychological, and behavioral stressors can be associated with capture and restraint of wild animals. These include strange sounds, sights, and odors, the effects of chemicals or drugs, apprehension or fright, and territorial upsets from displacement of animals by researchers. Animals that are stressed can incur contusions, concussions, lacerations, nerve injuries, hematomas, and fractures in their attempts to avoid capture or escape restraint (Fowler 1986). The stress response can change an animal’s physiological reaction to many drugs, including those commonly used for chemical restraint, which can have lethal consequences.

**Morphometric/Physiological Measurements and Tissue Sampling:** Most animals captured for sampling or marking are weighed and measured (e.g., standard length, girth). In addition to these morphometric measurements, blood samples are collected from pups and juveniles of both sexes by venipuncture for a variety of analyses ranging from basic health assessment to estimating blood volume. Muscle biopsies are obtained through small incisions with canula needles and can be used to analyze myoglobin content and fiber type. Evans blue dye is an injectable dye that is used to measure blood volume through a series of blood samples over 30 minutes. The technique is used in combination with muscle biopsies to estimate aerobic dive capacity, which could provide a better understanding of when young SSLs and NFSs become physiologically able to access various prey resources. Determining how aerobic dive capacity changes with developmental stage from pup to juvenile is also used in interpreting foraging behavior derived from telemetry data.

Skin biopsies are obtained by punching tissue from the webbing of the hind flipper, and are used for genetic analyses to identify biologically discrete (management) stocks, delineate home ranges, and evaluate site fidelity and the degree of population interchange. Blubber samples are taken through small incisions with a biopsy punch or a remotely-fired dart and are used to compliment studies of diet, feeding ecology (via analysis of fatty acids and stable isotopes), and contaminants. Wounds from tissue sampling procedures are usually left open (no

sutures or other methods will be used to close the wounds) to allow any abscesses that may form from infection to drain.

Fecal and fluid samples are collected from dermal lesions, eyes, rectum, and vaginal areas with sterile culture swabs and used for determination of parasites, disease, and hormone concentrations.

One pre-molar tooth is extracted under general anesthesia in order to estimate the age of the animal by sectioning the tooth in a laboratory and counting incremental growth layers. An animal's size at a given age is one of the most useful measures of body condition and is important in measurement of weaning status.

Vibrissae, hair, and nails are clipped for analysis of stable isotopes to determine the trophic level at which an animal has been feeding over time and potentially for genetic analyses.

Enemas are used to collect the contents of the digestive tract for analyses of an animal's diet. The process involves insertion of a tube into the rectum of an anesthetized animal followed by flushing with several liters of water. Researchers may also use stomach intubation on anesthetized animals as an alternative to, or in conjunction with, enemas for collecting diet samples. Stomach intubation may also be used to test for the presence of milk in pups and to obtain a milk sample.

Bioelectric Impedance Analysis (BIA) is a method for measuring body composition by measuring the conductivity across electrodes inserted subcutaneously (under the skin). The procedure involves inserting four needles, two just behind the skull and two near the tail, to measure the rate of a small current between them.

Portable ultrasound equipment can be used to obtain two-dimensional visualization of many internal organs and to estimate blubber thickness. The ultrasound equipment is used outside of the body or inserted vaginally or rectally. Animals must be either physically or chemically restrained to accomplish this procedure. Portable metabolic chambers have also been used to measure oxygen consumption and other physiological variables that relate to energy budget calculations.

Measurements of energy expenditure, food consumption, water (and milk) influx, total body water, and body composition can be obtained through techniques using injection of stable isotopes such as deuterium labeled water. An initial blood sample must be taken to determine the animal's natural isotopic background concentration along with an accurate measurement of the animal's mass. A measured amount of isotope is administered and the animal is held or recaptured after one to three hours to allow for isotope equilibration, and a second blood sample is taken.

Chromic oxide and Co-EDTA can be used as markers in studies of the digestibility of food. These substances, administered in or with food, allow quantification of the rate of passage of food through the digestive track. They also allow measurement of the relationship between food intake and digestibility of various food items. This technique requires that animals be maintained in "dry holding" for up to 48 hours to eliminate access to additional food and water during the trial while allowing for collection of urine and feces.

**Permanent and Temporary Marking:** Animals that are captured are routinely marked to facilitate monitoring of post-procedure animals, to avoid or facilitate recapturing animals that have already been sampled, and to determine a population's vital rates such as age-specific survival and age at first reproduction. Studies on seasonal movements, site fidelity and dispersal are also facilitated by the ability to identify individuals at a distance. Brightly colored plastic tags bearing unique alphanumeric codes may be affixed to flippers of any animal captured, including pups as young as one week old. These types of tags are affixed to the trailing edge of each foreflipper, through the loose skin near the area where the flipper meets the body, using special pliers in a process similar to ear piercing. Flipper tags are subjected to extreme physical abuse and under typical field conditions they are expected to last four to six months before being torn loose or becoming unreadable.

Hot-branding is the technique currently used to permanently mark SSLs with a unique combination of numbers and/or letters. It involves the use of steel branding irons, heated to “red-hot” (about 500 °F) in a propane forge, and applied to the shoulder of an anesthetized animal to produce burns that penetrate the entire outer layer of the skin and into the inner skin layer (i.e., 2nd degree burns). These burns are characterized by formation of blisters, swelling, and fluids seeping from the burned area. Each brand requires about one minute to complete, exclusive of preparation and anesthesia. The effects of hot-branding and freeze-branding are discussed in more detail in Sections 2.9 and 2.10 of Appendix B. Any captured and sampled animals of all ages may be hot-branded for future identification. The process of branding pups on rookeries usually involves driving the majority of juvenile and adult animals from the rookery, as described for ground counts previously. Branding of animals captured at sea, outside of breeding season, or otherwise away from rookeries may not result in disturbance of other animals.

**External Attachment of Instruments:** Various instruments such as VHF transmitters and satellite-linked time depth recorders (SLTDR) may be attached to animals for remote collection of data on movement patterns and foraging behavior. Instrument packages are usually attached to the dorsal surface, head, or flippers by gluing to the hair with a fast-drying epoxy adhesive. The duration of instrument attachment is dependent on the timing of molt because the instrument will be shed as the hair is molted. The mass, dimensions, and drag characteristics of the instruments vary with the type of instrument and should be designed so that they do not interfere with an animal’s ability to forage or function.

**Insertion/Implantation of Instruments:** Life History Transmitters (LHX tags) are data loggers equipped with sensors to monitor pressure, motion, light levels, temperature, and conductivity. They are surgically implanted in the peritoneal cavity under general anesthesia and record data from the sensors for up to 10 years. Surgical incisions are closed using absorbable sutures and the instrument is retrieved after the animal dies.

Other types of instruments, such as stomach temperature “pills,” can be inserted under sedation or anesthesia into an animal’s stomach through the mouth. Sensors measure changes in pressure, impedance, and stomach temperature that are correlated to feeding events and transmit the data to implanted data loggers or externally attached satellite transmitters. When used with external dive recorders and satellite tags, stomach temperature sensors can provide data about when and where geographically and in the water column prey are captured.

**Transport and Temporary Captivity:** The Alaska SeaLife Center (ASLC) has had permits to capture and transport SSLs to its facility in Seward, Alaska, where the animals are held for several months and used in a variety of nutritional and physiological studies before being released to the wild. While the NMFS research permit governs the capture, research conditions, and eventual release requirements, the conditions for their humane transport and care in the holding facilities are governed by the requirements of the AWA, which is administered by the U.S. Department of Agriculture’s Animal and Plant Health Inspection Service (APHIS). Pursuant to the AWA, the research procedures must be reviewed and approved by the ASLC’s Institutional Animal Care and Use Committee (IACUC). The experiments conducted on these “transient” SSLs involve a variety of feeding regimes, injection of various substances, and collection of various tissue samples, including blood and blubber. All animals are marked with a flipper tag or hot-brand and may have external scientific instruments attached prior to being returned to the wild. The studies conducted by the ASLC on these “transient” SSLs are intended to provide a basis for interpreting samples taken from animals in the wild with regard to nutritional and metabolic responses to different environmental variables.

**Incidental Mortality:** No existing permit authorizes intentional lethal takes of SSLs or NFSs. However, to acknowledge the fact that there is an inherent risk of serious injury and mortality associated with some research activities on wild animals, all permits allow for a limited number of mortalities incidental to the research. The number of incidental mortalities allowed is based on a permit holder’s estimate of the potential for such mortalities.

Consistent with the broad definitions of “take” under the MMPA and ESA, permits issued pursuant to Section 104 of the MMPA and Section 10(a)(1)(A) of the ESA provide an exemption from the take prohibitions for any mortality resulting from the actions or presence of the researchers while conducting permit-authorized activities,

as limited by the numbers specified in the permit. This exemption includes, but is not limited to: deaths of dependent pups by starvation following abandonment resulting from disturbance to a rookery or research-related death of a lactating female; adverse reactions to anesthetics or other chemical agents; infections resulting from intrusive research procedures; capture myopathy resulting from the stress of capture and handling; and serious injuries sustained in attempts to escape or evade capture or in response to stampedes, or aggressive social interactions caused by research activities.

One way to divide research activities into two broad categories is to consider them either non-intrusive or intrusive. Non-intrusive activities are those that do not result in physical contact between researchers and SSLs or NFSs (e.g., aerial surveys, vessel surveys, observational activities) and intrusive activities are those that require physical contact (e.g., capture/handling, tissue sampling, marking). In general, the risks of adverse effects (such as stress, pain, injury or mortality) on individual seal lions and fur seals are greater from intrusive activities than non-intrusive. However, non-intrusive activities may also have adverse effects due to disturbance, particularly for repeated disturbance or disturbances occurring over a broad area. It should also be noted that so called “non-intrusive” activities that affect a large number of individuals (e.g., groups of seals entering the water when disturbed on a haulout) may have a greater adverse impact on a population than an “intrusive” activity affecting just a few individuals (e.g., capturing a fur seal at the edge of a rookery without causing widespread disturbance in the vicinity).The following table summarizes the potential effects associated with the current research techniques on SSLs and NFSs and the level of potential risk involved with different procedures. A more detailed account of these procedures and risks is included in Appendix B.

**Table 2.3-1 Summary of Potential Effects of Research Activities**

Research Activities	Summary of Potential Effects	
	Steller Sea Lions	Northern Fur Seals
<b>Non-Intrusive</b>		
Aerial surveys	<ul style="list-style-type: none"> <li>• Reactions to disturbance range from none to complete departure of individuals from haul-out</li> <li>• Effects of disturbance:               <ul style="list-style-type: none"> <li>- Pups may be trampled or abandoned</li> <li>- Pups may be knocked into water and not be able to climb cliffs to return</li> <li>- Pups that return, may suffer hypothermia or respiratory complications from aspirating water</li> <li>- Juveniles/adults may be injured by sliding/crashing into cliff facings or underwater rocks</li> <li>- Excessive metabolic heat from flight response</li> <li>- Cause aggressive interactions resulting in injury to adults and/or pups</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Same as SSL (although less chance of pups being knocked into water because of location of fur seal rookeries)</li> <li>• Potential masking of vocalizations because spectra of aircraft noise similar to vocalizations</li> </ul>
Vessel surveys	<ul style="list-style-type: none"> <li>• Disturbance effects (described for aerial surveys) when vessel approaches haul-out/rookery</li> <li>• Known to approach or avoid vessels at sea</li> </ul>	<ul style="list-style-type: none"> <li>• Same as SSL</li> </ul>
Ground surveys	<ul style="list-style-type: none"> <li>• Disturbance effects (described for aerial surveys) when researchers come onshore</li> </ul>	<ul style="list-style-type: none"> <li>• Same as SSL</li> <li>• Separation of mother/pup if disturbance occurs before vocal recognition is established for newborn pups</li> </ul>
Scat collection	<ul style="list-style-type: none"> <li>• Disturbance effects (described for aerial surveys) when researchers come onshore</li> </ul>	<ul style="list-style-type: none"> <li>• Same as SSL</li> </ul>
Remote video/photographic monitoring	<ul style="list-style-type: none"> <li>• Disturbance effects (described for aerial surveys) when researchers come onshore for installation/maintenance/repair (installation occurs outside breeding season)</li> </ul>	<ul style="list-style-type: none"> <li>• Same as SSL</li> </ul>
Receipt of tissue samples from Alaska Natives that have taken the animal legally for subsistence harvest	<ul style="list-style-type: none"> <li>• No effects</li> </ul>	<ul style="list-style-type: none"> <li>• Same as SSL</li> </ul>
Receipt of tissue samples from animals found dead from other causes	<ul style="list-style-type: none"> <li>• No effects</li> </ul>	<ul style="list-style-type: none"> <li>• Same as SSL</li> </ul>
<b>Intrusive</b>		
Capture/ Restraint	<ul style="list-style-type: none"> <li>• Variety of somatic, psychological, and behavioral stressors (strange sights, sounds, odors)</li> <li>• Incur injuries in their attempts to avoid capture or escape restraint</li> <li>• Unintended effects from chemical or drugs</li> <li>• Territorial/hierarchical modifications associated with displacement of animals by researchers</li> <li>• Capture myopathy</li> </ul>	<ul style="list-style-type: none"> <li>• Same as SSL</li> </ul>

**Table 2.3-1 (continued)**

**Summary of Potential Effects of Research Activities**

Research Activities	Summary of Potential Effects	
	Steller Sea Lions	Northern Fur Seals
<b>Intrusive</b>		
Anesthesia/ Sedation/ Drugs	<ul style="list-style-type: none"> <li>• Stress/injury from capture/restraint</li> <li>• Potential infection at injection site</li> <li>• Puncture of organs from injection of darts</li> <li>• Apnea (stop breathing) or respiratory depression</li> <li>• Accumulation of fluid in lungs</li> <li>• Disorientation, blurred vision, nausea</li> <li>• Bradycardia (slowed heart rate)/Tachycardia (increased heart rate)</li> <li>• Hypothermia/Hyperthermia</li> </ul>	<ul style="list-style-type: none"> <li>• Same as SSL</li> </ul>
Collection of morphometric measurements	<ul style="list-style-type: none"> <li>• Stress/injury from capture/restraint</li> </ul>	<ul style="list-style-type: none"> <li>• Same as SSL</li> </ul>
Collection of blood samples	<ul style="list-style-type: none"> <li>• Stress/injury from capture/restraint</li> <li>• Infection of wound site</li> <li>• Damage to vein, clotting, abscess</li> </ul>	<ul style="list-style-type: none"> <li>• Same as SSL</li> </ul>
Muscle/ Skin/ Blubber biopsies	<ul style="list-style-type: none"> <li>• Stress/injury from capture/restraint</li> <li>• Risks associated with anesthesia</li> <li>• Infection from wound site</li> </ul>	<ul style="list-style-type: none"> <li>• Same as SSL</li> </ul>
Fecal and fluid samples/enema/stomach intubation	<ul style="list-style-type: none"> <li>• Stress/injury from capture/restraint</li> <li>• Perforation of stomach/rectum/bladder/urethra</li> <li>• Introduction of liquid into trachea</li> </ul>	<ul style="list-style-type: none"> <li>• Same as SSL</li> </ul>
Tooth extraction	<ul style="list-style-type: none"> <li>• Stress/injury from capture/restraint</li> </ul>	<ul style="list-style-type: none"> <li>• Same as SSL</li> </ul>
Collection of vibrissae, hair, and nails	<ul style="list-style-type: none"> <li>• Stress/injury from capture/restraint</li> <li>• No pain from clipping</li> </ul>	<ul style="list-style-type: none"> <li>• Same as SSL</li> </ul>
Bioelectric Impedance Analysis	<ul style="list-style-type: none"> <li>• Stress/injury from capture/restraint</li> <li>• Pain/infection from insertion of needles</li> <li>• Repeated BIA could cause skin and subcutaneous lesions</li> </ul>	<ul style="list-style-type: none"> <li>• Same as SSL</li> </ul>
Ultrasound/X-Ray	<ul style="list-style-type: none"> <li>• Stress/injury from capture/restraint</li> </ul>	<ul style="list-style-type: none"> <li>• Same as SSL</li> </ul>
Stable isotope injection	<ul style="list-style-type: none"> <li>• Stress/injury from capture/restraint</li> <li>• Infection of injection site</li> </ul>	<ul style="list-style-type: none"> <li>• Same as SSL</li> </ul>
Chromic oxide and Co-EDTA	<ul style="list-style-type: none"> <li>• Stress/injury from capture/restraint</li> <li>• Infection of injection site</li> </ul>	<ul style="list-style-type: none"> <li>• Same as SSL</li> </ul>
Temporary marking	<ul style="list-style-type: none"> <li>• Stress/injury from capture/restraint</li> <li>• Toxicity of marking substance through ingestion during grooming</li> <li>• No effects from shearing</li> </ul>	<ul style="list-style-type: none"> <li>• Thermal stress from shearing</li> </ul>
Permanent marking	<ul style="list-style-type: none"> <li>• Stress/injury from capture/restraint</li> <li>• Brief acute stress from branding (mitigated with anesthesia)</li> <li>• Pain from blisters/swelling and minor tissue trauma</li> <li>• Short-term immune response (increase in white blood cell, platelets, etc.)</li> <li>• Infection of wound</li> </ul>	<ul style="list-style-type: none"> <li>• Same as SSL</li> </ul>



**Table 2.3-1 (continued)**

**Summary of Potential Effects of Research Activities**

Research Activities	Summary of Potential Effects	
	Steller Sea Lions	Northern Fur Seals
<b>Intrusive</b>		
Flipper tagging	<ul style="list-style-type: none"> <li>• Stress/injury from capture/restraint</li> <li>• Momentary pain</li> <li>• Infection at tagging site</li> <li>• Tag may tear out of flipper</li> </ul>	<ul style="list-style-type: none"> <li>• Same as SSL</li> </ul>
Attachment (external) of scientific instruments measurements	<ul style="list-style-type: none"> <li>• Stress/injury from capture/restraint</li> <li>• Pain from burning due to improper mixing of epoxy</li> <li>• Discomfort if placement of instrument causes pulling of hair/skin</li> <li>• Infection from wound site if instrument is torn off</li> <li>• Alter buoyancy or drag of animal thereby reducing foraging and/or predatory avoidance ability and increasing energy expenditure</li> </ul>	<ul style="list-style-type: none"> <li>• Same as SSL</li> </ul>
Insertion/implantation (internal) of instruments	<ul style="list-style-type: none"> <li>• Stress/injury from capture/restraint</li> <li>• Infection at wound site</li> <li>• Excessive tissue reaction</li> <li>• Rejection of implanted materials</li> </ul>	<ul style="list-style-type: none"> <li>• Same as SSL</li> </ul>
Temporary captivity	<ul style="list-style-type: none"> <li>• Stress/injury from capture/restraint</li> <li>• Stress of captivity</li> </ul>	<ul style="list-style-type: none"> <li>• Same as SSL</li> </ul>

**2.4 Components Common to All Alternatives**

**2.4.1 Activities that Do Not Require Permits**

There are a number of activities that do not require the types of research permits that are the subject of this PEIS, either because they would not result in takes of SSLs, NFSs, or other protected species; or because they are otherwise exempt from the prohibitions of the MMPA and ESA. These activities would be unaffected by any of the alternatives. There would be no impact on grant programs related to these types of activities under any of the alternatives.

Analysis of existing data does not require a permit and could proceed under any of the alternatives. Certain types of research linked to investigating the decline of SSLs, such as oceanographic surveys, do not require the types of permits that are the subject of the PEIS. However, oceanographic surveys and certain other activities conducted in the marine environment that may affect SSLs, NFSs, or other marine mammals may require authorizations or permits such as Incidental Harassment Authorizations under Section 101 of the MMPA or Incidental Take Permits under Section 10(a)(1)(b) of the ESA. The requirements for these types of permits or authorizations are not within the scope of this PEIS.

The ESA contains provisions that specifically exempt Alaska Natives from prohibitions against “take” (except if the Secretary of Commerce, in consultation and collaboration with affected Alaska Natives, determines that such take “materially and negatively affects the threatened or endangered species”). The MMPA contains similar exemptions for Alaska Natives. These exempted activities by Alaska Natives include:

- subsistence hunting for consumption by “any Indian, Aleut, or Eskimo who resides in Alaska and who dwells on the coast of the North Pacific Ocean or the Arctic Ocean” if such taking is not done in a wasteful manner;

- disturbance of animals associated with subsistence hunting;
- transport, possession, and consumptive use of subsistence taken animals by Alaska Natives;
- sale of edible portions of animals in Native villages and towns in Alaska for Native consumption;
- possession of tissue samples from harvested animals for use in other research projects (non-Native researchers must have permits to possess and use such tissue samples); and
- sale of non-edible body parts that have been made into authentic Native articles of handicrafts and clothing without the use of pantographs, multiple carvers, or other mass copying devices.

These exempted activities by Alaska Natives do not require permits from NMFS and are therefore not affected by any of the alternatives presented in this PEIS. In addition, NMFS is obligated to conduct government-to-government consultations with Alaska Natives on issues concerning the health and well-being of their communities and the natural resources upon which they depend. NMFS has entered into co-management agreements for SSLs and NFSs with the Pribilof Islands communities and is in the process of negotiating co-management agreements for SSLs with other Alaska Native groups (Appendix F). Through these co-management agreements and other consultation processes, Alaska Native organizations have collaborated with NMFS, other agencies, and private institutions on several aspects of research related to SSLs and NFSs, including:

- developing research and management priorities;
- developing research plans;
- assisting with field logistics;
- participating with observations at remote sites;
- voluntarily supplying tissue samples from subsistence hunts; and
- contributing traditional ecological knowledge about SSLs, NFSs, and environmental factors.

The opportunity for researchers to engage in these or other collaborative efforts with Alaska Natives would be common to all alternatives, although the scope of research effort varies between alternatives.

#### **2.4.2 Activities that Require Permits**

There are two broad categories of research activities that require permits. One consists of research that does not involve capture, handling, or collection of tissue from live animals. The other consists of research that requires capture, handling, or invasive procedures on live animals. Both categories of research have some potential for direct and indirect mortality. Table 2-1 contains additional detail on what general types of research activities fall into each of these two categories. The type and amount of these activities would vary across the alternatives.

Common to all permits under any alternative are the statutory and regulatory criteria established under Section 10(a)(1)(A) of the ESA (16 U.S.C. 1539), Section 104 of the MMPA (16 U.S.C. 1374), and NMFS implementing regulations (50 CFR §216.31-216.41 and §222.301-222.309). Permits for research on all marine mammals must be consistent with the following criteria established under the MMPA:

- The proposed activity is humane and does not present any unnecessary risks to the health and welfare of marine mammals. “Humane” is defined in the MMPA as “that method of taking which involves the least possible degree of pain and suffering practicable to the mammal involved.”
- The proposed activity by itself or in combination with other activities is not likely to have a significant adverse impact on the species or stock.
- The applicant’s expertise, facilities, and resources are adequate to successfully accomplish the objectives and activities stated in the application.
- If a live animal will be held captive or transported, the applicant’s qualifications, facilities, and resources are adequate for the proper care and maintenance of the marine mammal.

- The proposed activity furthers a bona fide scientific or enhancement purpose.
- If the lethal taking of marine mammals is proposed: (i) non-lethal methods for conducting the research are not feasible; and (ii) for depleted, endangered, or threatened species, the results will directly benefit that species or stock, or will fulfill a critically important research need.
- For species or stocks designated or proposed to be designated as depleted, or listed or proposed to be listed as endangered or threatened: (i) The proposed research cannot be accomplished using a species or stock that is not designated or proposed to be designated as depleted, or listed or proposed to be listed as threatened or endangered; (ii) The proposed research, by itself or in combination with other activities will not likely have a long-term direct or indirect adverse impact on the species or stock; (iii) The proposed research will either: (A) Contribute to fulfilling a research need or objective identified in a species recovery or conservation plan, or if there is no conservation or recovery plan in place, a research need or objective identified by the Office Director in stock assessments established under section 117 of the MMPA; (B) Contribute significantly to understanding the basic biology or ecology of the species or stock, or to identifying, evaluating, or resolving conservation problems for the species or stock; or (C) Contribute significantly to fulfilling a critically important research need.

**Table 2.4-1 Research Activities Requiring Permits**

<b>Research Activities</b>	
<b>That Result in No Capture, Handling, or Collection of Tissue</b>	<b>That Require Capture, Handling, or Collection of Tissue</b>
<ul style="list-style-type: none"> <li>• Aerial, vessel, and ground surveys – conducted to count animals, resight animals that have been tagged and branded, and to document behavioral observations.</li> <li>• Scat collection – occurs on rookeries and haulouts and is used to estimate recent prey consumed.</li> <li>• Remote monitoring – includes photographs and video images from remote stations located to document seasonal movements, changes in population structure, number of entangled or injured animals, and record presence of tagged or branded animals.</li> <li>• Receipt of tissue samples from Alaska Natives who have taken the animal legally for subsistence harvest; used to measure chemical/physiological parameters.</li> <li>• Receipt of tissue samples from animals found dead from other causes; used to measure chemical/physiological parameters.</li> </ul>	<ul style="list-style-type: none"> <li>• Collection of morphometric measurements – includes external measurements of an animal.</li> <li>• Collection of tissue samples – including skin, muscle, blubber, vibrissae, teeth, blood, and fluids.</li> <li>• Analysis of body composition – through injection of stable isotopes, ultrasound, bioelectric impedance analysis, chromic oxide and Co-EDTA, and portable metabolic chamber.</li> <li>• Enema or stomach intubation – used to collect and analyze stomach/digestive tract contents.</li> <li>• Permanent or temporary marking of animals – includes plastic tags secured on the foreflipper, hot-branding, and freeze-branding, which are used to monitor animals, to facilitate recapture of sampled animals, and to determine population’s vital rates.</li> <li>• Attachment of scientific instruments – used to collect information on movement patterns and foraging behavior.</li> <li>• Insertion/implantation of instruments – used to monitor pressure, motion, light levels, temperature, and conductivity.</li> <li>• Temporary captivity – temporary removal from wild, transportation, and studies of the animal’s nutrition and physiology.</li> </ul>

For ESA-listed species, in addition to the requirements under the MMPA, the following criteria must be considered in determining whether or not to issue a permit for scientific purposes:

- the permit would not operate to the disadvantage of the endangered species;
- the permit would enhance the survival of the endangered species, taking into account the benefits anticipated to be derived on behalf of the endangered species;
- the status of the population and the direct and indirect effects of the proposed action on the population;
- how the applicant's needs, program, and facilities compare and relate to proposed and ongoing projects and programs; and
- the opinions of scientists or other persons or organizations knowledgeable about the species or other matters germane to the application.

Scientific research permits issued by NMFS pursuant to the above statutes and regulations contain a number of conditions that are intended to ensure compliance of the research with the purposes of the MMPA and ESA. Other conditions commonly included in these permits are intended as measures to mitigate potential adverse impacts of the research. Mitigation for specific research procedures is discussed in Appendix B. Some conditions are discretionary and may not be incorporated into all permits, whereas others are dictated by the statutes or regulations and would be part of all permits. See Chapter 5 of this document for additional types of conditions that NMFS may consider for future permits. The following conditions have been incorporated into previous research permits:

- the duration of the permit (five year maximum by regulation);
- how requests for amendments could be addressed;
- requirements for how researchers notify the NMFS regional office about field logistics prior to each field season, with the intent that the information would be used to promote coordination between different research groups and to avoid excessive research activity in any one location;
- requirements for researchers to coordinate directly with other researchers doing similar work in the same areas, to reduce redundancy and repeated disturbance of the same animals;
- monitoring requirements to determine the status of individual animals after they have been handled and the effects of research-related disturbance on the rookery/haulout, especially in relation to the incidence of serious injury and mortality;
- reporting requirements for timely dissemination of research results and notification of publications;
- types of information required in annual and final reports; and
- conditions requiring annual reauthorization of multi-year permits based on the adequacy of information provided in the annual report.

## **2.5 Establishing Serious Injury and Mortality Limits Under the Alternatives**

The alternatives presented in the following sections represent different levels of research effort, each with a range of research techniques and intensities that could be authorized (assuming all permit issuance criteria are met). NMFS acknowledges that all research activities create some risk of injury to animals. Some research activities, like aerial surveys, may cause disturbance reactions in a very small proportion of the animals being surveyed but will affect a large proportion of the entire population because the surveys are conducted over a large proportion of the population. Other research activities, like tissue sampling from captured animals, may result in stressful situations for every animal involved but will affect only a small proportion of the population because not all animals are captured or sampled.

Animals may display a wide range of reactions to a given research activity depending on the individual animal, the actions of the researchers, timing and location of the research, and environmental factors such as sea

conditions and weather. Some reactions may be very minor and short-term, others may cause injuries that could temporarily hamper foraging, and others may constitute serious injuries that result in death. Each research activity, therefore, has different inherent risks to the population, measured by a combination of the intensity of possible responses and the number of animals affected. While decisions to issue permits should not be based solely on balancing relative benefits of the research against adverse impacts to the species, it is important to remember that research permits for threatened and endangered species are issued for conservation purposes, so the information collected should ultimately result in benefits to the recovery of the species.

Chapter 4 of this PEIS describes the methodology and risk assessment analysis for the research efforts represented by each of the alternatives. One of the metrics used to measure the possible risks of research is a calculation of potential serious injury and mortality that results from a given number of takes for different research activities. The importance of this number of potential mortalities to the species is relative to the status of the population or stock of animals it affects. This PEIS concerns research on two different species but four distinct management stocks as defined under the MMPA, each with different population trends and management status. In order to assess the potential effects of research on the four different management stocks, NMFS has decided to compare the number of potential research-related mortalities for each alternative with a well known measure of fisheries-related mortality that takes into account the stock's abundance, reproductive potential, and conservation status: the calculated value for Potential Biological Removal (PBR). PBR is used in this PEIS as a tool for gauging varying levels of accepted "mortality and serious injury risk" across the alternatives, which is described in more detail in Section 2.6.

The MMPA, as reauthorized in 1994, established a management objective to reduce incidental mortality of marine mammals in commercial fisheries. To this end it defined an upper limit guideline for fishery-related mortality for each species and/or management stock, its PBR. PBR is defined in the MMPA 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 optimum sustainable population." The MMPA defines the calculation of PBR as the product of three elements: the minimum population estimate ( $N_{min}$ ); half the maximum net productivity rate ( $0.5 R_{max}$ ); and a recovery factor ( $Fr$ ) based on the status of the stock. The technical justifications and statistical criteria for each of these elements are described by Wade (1998 and 2005).

PBR describes an upper limit of animals that could be removed from a population of marine mammals without causing the population to drop or remain below its optimal sustainable population (OSP). This limit is not meant to imply that if human-mortality is below PBR, a population below OSP would necessarily increase, because other resource limitations could be limiting population growth. Rather, this limit implies that for a declining population in which direct human-caused mortality is below PBR, the human-caused mortality is the cause of neither the decline nor the failure of the population to recover. The formula for PBR is therefore a precautionary or conservative measure of human-caused mortality that could be expected to affect a population's ability to recover from a depleted state or to remain at a sustainable level. It is based on the concept that each stock will have a natural ability to expand if it has a positive value for net production (gross reproduction minus natural mortalities). The idea is to prevent human-caused mortalities from creating a net production loss. The PBR calculation contains provisions to account for uncertainty in population estimates and protects a larger fraction of net production for depleted stocks through the  $Fr$ . The use of an  $Fr$  less than 1.0 allocates a proportion of expected net production towards population growth and compensates for uncertainties that might prevent population recovery, such as biases in the estimation of  $N_{min}$  and  $R_{max}$ , or errors in the determination of stock structure.

For endangered stocks,  $Fr$  is set at 0.1, so that 90 percent of the endangered stock's annual net production is reserved for recovery of the stock. Through a series of extensive simulation modeling, NMFS has calculated that keeping human-caused mortality at or below PBR calculated with a recovery factor of 0.1 would increase the recovery time of endangered marine mammals by no more than 10 percent (Wade 1998). For threatened and depleted stocks,  $Fr$  is set at 0.5 so that 50 percent of the stock's annual net production is reserved for recovery. However, because its population trend has been increasing for almost 20 years,  $Fr$  for the threatened eastern

distinct population segment (DPS) of SSLs has been set at 0.75. For non-depleted stocks, Fr is set at 1.0 so that human-caused mortality could account for 100 percent of a stock's annual net production and still not cause a decline in the population. It is important to realize that for endangered, threatened, and depleted stocks, the use of an Fr <1.0 means that human-caused mortalities that exceed PBR would not cause the population to decline (unless human-caused mortality accounted for all of the annual net production), but could slow the rate that the population recovers. The PBR approach was tested extensively through simulation trials (Wade 1998) to evaluate robustness to variability or biased abundance estimates, mortality estimates and other parameters. These simulations demonstrated that 95% of the trials equilibrated within OSP levels when default parameters for Nmin, Rmax, and an appropriate recovery factor were used. Consequently, NMFS concluded that the PBR approach was an appropriately conservative mechanism to evaluate the effect of human-caused mortality on a stock, even for many declining populations (NMFS 1992, Barlow et al. 1995, Wade and Angliss 1997, Wade 1998, Wade 2005). Such a conclusion applied when the value for the recovery factor was 0.5. When the recovery factor value was 0.1, more than 95 percent of simulations equilibrated within OSP levels; thus, the approach is even more conservative for those stocks with the recovery factor of 0.1 (e.g., the western DPS of SSLs). Using the information from Wade (1998), human-caused mortality at a level equal to PBR of a stock with a recovery factor of 0.1 would cause the population to equilibrate within 95 percent of the abundance it would have achieved without such mortality. An equilibrium level so close to an unexploited population level indicates minimum impact to the population.

The MMPA requires NMFS to calculate PBR for each management stock of marine mammal, if possible, and to describe those calculations in its annual stock assessment reports. Based on the most recent stock assessment data (Angliss and Outlaw 2007, Carretta *et al.* 2007), PBR for the endangered western DPS of SSLs is 234 animals; PBR for the threatened eastern DPS of SSLs is 2,000 animals; PBR for the depleted eastern Pacific stock of NFSs is 15,262 animals; and PBR for the San Miguel Island stock of NFSs is 219 animals.

As described, the different levels of research activity represented in the alternatives correspond to different levels of risk to individual animals. Increased intensity of field research and more intrusive types of research pose greater risks to individuals, even if they provide useful information for conservation purposes. In order to provide a guideline for the maximum amount of risk to individuals that would be acceptable under each of the alternatives, NMFS has established an upper threshold level of mortality relative to PBR. This does not mean that NMFS would be obligated to authorize takes up to these threshold levels or that a certain percentage of PBR will be allocated to research regardless of other types of mortality. These upper limits will be used only as guidelines for the permitting process.

## **2.6 Alternatives Carried Forward for Analysis**

Four alternatives will be carried forward for analysis of environmental consequences in this PEIS. These alternatives represent a reasonable range of research granting and permitting options that fulfill the purpose and need for the federal action as described in Chapter 1. The general policy direction of each alternative is described below, and examples of the specific research activities permitted under each alternative are listed in Table 2.6-1. Table 2.6-2 provides more detailed information on the types of research activities that would be granted and permitted under each alternative as well as the threshold level of total potential mortality authorized (incidental and intentional mortality combined) across each alternative.

**Table 2.6-1 Research Activities Allowed Under Each Alternative**

<b>Research Activities</b>	<b>Alternative 1 – No Action: No New Permits or Authorizations</b>	<b>Alternative 2 – Research Program Without Capture or Handling</b>	<b>Alternative 3 – Status Quo Research Program</b>	<b>Alternative 4 – Research Program with Full Implementation of Conservation Goals</b>
Research activities on live animals with No capture, restraint, or collection of tissues				
Aerial surveys	*	√	√	√
Vessel surveys	*	√	√	√
Ground surveys	*	√	√	√
Scat collection	*	√	√	√
Remote video/photographic monitoring	*	√	√	√
Receipt of tissue samples from Alaska Natives that have taken the animal legally for subsistence harvest	√	√	√	√
Receipt of tissue samples from animals found dead from other causes	√	√	√	√
Research activities on live animals that requires capture, restraint, or collection of tissues				
Collection of morphometric measurements	--	--	√	√
Collection of blood samples	--	--	√	√
Muscle biopsies	--	--	√	√
Skin biopsies	--	--	√	√
Blubber samples	--	--	√	√
Fecal and fluid samples	--	--	√	√
Extraction of pre-molar teeth	--	--	√	√

**Table 2.6-1 (continued) Research Activities Allowed Under Each Alternative**

Research Activities	Alternative 1 No Action: No New Permits or Authorizations	Alternative 2 Research Program Without Capture or Handling	Alternative 3 – Status Quo Research Program	Alternative 4 Research Program with Full Implementation of Conservation Goals
Collection of vibrissae, hair, and nails	--	--	√	√
Enema or stomach intubation	--	--	√	√
Bioelectric Impedance Analysis	--	--	√	√
Ultrasound	--	--	√	√
Stable isotope injection	--	--	√	√
Chromic oxide and Co-EDTA	--	--	√	√
Temporary marking	--	--	√	√
Research activities on live animals that requires capture, restraint, or collection of tissues				
Attachment (external) of scientific instruments measurements	--	--	√	√
Attachment (external) of scientific instruments measurements	--	--	√	√
Insertion/implantation (internal) of instruments	--	--	√	√
Temporary captivity	--	--	√	√
Intentional take of animals	--	--	--	√
<b>Note:</b>	* No new permits or authorizations would be issued under Alternative 1. However, grants could be issued and surveys, observations, and scat collections could occur under circumstances that would not result in disturbance or takes.			
<b>Key:</b>	--	Not Allowed		
	√	Allowed		

**2.6.1 Alternative 1 – No Action: No New Permits or Authorizations**

The No Action Alternative, which must be considered in an EIS according to CEQ regulations, would only allow research activities on SSLs and NFSs that either do not require a permit or are currently allowed under permits that have not been vacated by the May 26, 2006, court order (Civil Action No. 05-1392 ESH), which are valid through 2010. No new permits would be issued to replace these permits as they expire, nor could existing permits be amended to allow modifications in research activities, sample sizes, or objectives. Further, no grants would be awarded for research that requires a permit, except for those activities authorized under existing permits. When the existing permits expire, all research activities that require a permit would have to cease, or researchers would risk violation of the MMPA, ESA, and NMFS regulations. Under Alternative 1, no incidental or intentional mortality due to research activities would be acceptable or authorized. This policy of not issuing new permits or grants for research-related takes would be applicable to both populations of SSLs and both stocks of NFSs.

Although researchers could not approach or capture animals to collect data, they could use remote sensing techniques, behavioral observations, scat collection from vacant haulouts and rookeries, and aerial surveys conducted at distances and conditions that are not likely to result in takes (and therefore would not require permits). Researchers could obtain permits and be awarded grants for receipt and use of tissue samples from Alaska Natives who agree to provide samples from animals that have been taken legally for subsistence harvest. Permits and grants could also be awarded for receipt and use of tissues from animals that have been found dead (stranded) due to other causes, but these samples could only be collected by means that would not result in takes of live SSLs or NFSs, or would be collected under the provisions of the MMPA’s Marine Mammal Health and Stranding Response Program (MMHSRP)(Title IV, 16 U.S.C. 1421) and the permit held by the MMHSRP. This



alternative would therefore allow researchers to use only techniques that do not disturb animals in the wild in order to monitor the populations and collect information pertinent to their recovery. Research on captive SSLs and NFSs (those already in captivity at this time) would be unaffected by these alternatives, which are specific to permits for research on free-ranging animals. However, under the No Action Alternative, no additional SSLs or NFSs could be brought into captivity, either by removal from the wild or via captive breeding.

For SSLs, research on the western population would be limited by exclusion from certain geographic areas in the Aleutian Islands (AI) and Gulf of Alaska (GOA) designated by federal regulation as “no-approach” buffer areas (50 CFR 223.202). These buffer areas extend 3 nautical miles (nm)(5.5 kilometers [km]) around SSL rookeries ranging from 59°20.5 N by 150°21.0 W to 52°54.5 N by 172°28.5 E (Table 1 to 50 CFR 223.202: Listed Steller Sea Lion Rookery Sites). By regulation, no vessel may approach within the 3-nm perimeter for these sites except by permit, for subsistence taking, or in an emergency. Further, these regulations prohibit any person from approaching by land (unless privately owned) within one-half statutory mile (0.8 km) of these sites or within sight of an SSL rookery listed in the regulations. For Marmot Island, no person may approach on land not privately owned within 1.5 statutory miles (2.4 km) or within sight of the eastern shore of Marmot Island. Thus, without permits, even those activities not likely to result in harassment takes (e.g., behavioral observations, scat collections from vacant haulouts) would be prohibited under this alternative for any western SSL population sites listed in these regulations.

## **2.6.2 Alternative 2 – Research Program without Capture or Handling**

The policy direction of this alternative would be to issue permits and to provide grant support to qualified individuals and institutions to conduct research on SSLs and NFSs using methods that would not involve capturing and handling of animals or researcher presence on rookeries during the breeding season. This alternative would also prohibit intrusive research, where intrusive is defined at 50 CFR 216.3 to mean a procedure conducted for bona fide scientific research involving: a break in or cutting of the skin or equivalent, insertion of an instrument or material into an orifice, introduction of a substance or object into the animal’s immediate environment that is likely either to be ingested or to contact and directly affect animal tissues (i.e., chemical substances), or a stimulus directed at animals that may involve a risk to health or welfare or that may have an impact on normal function or behavior (i.e., audio broadcasts directed at animals that may affect behavior). This restriction on intrusive activities would essentially limit research to censusing surveys and behavioral observations that have a very small potential to cause injury to animals. Under Alternative 2, the total amount of incidental mortality allowed under all permits and authorizations would not exceed 5 percent of PBR for each stock (western SSL is 12 animals, eastern SSL is 100, eastern Pacific NFS is 763, San Miguel Island NFS is 11). No intentional lethal take would be authorized under Alternative 2.

As with the No Action Alternative, under this alternative, researchers could obtain permits and be awarded grants for receipt and use of tissue samples from Alaska Natives who agree to provide samples from animals that have been taken legally for subsistence harvest. Permits and grants could also be awarded for receipt and use of tissues from animals that have been found dead (stranded) due to other causes, but these samples could only be collected by means that would not result in takes of live SSLs or NFSs, or would be collected under the provisions of the MMHSRP (Title IV, 16 U.S.C. 1421) and the permit held by the MMHSRP.

Scat collection would be allowed but only from haulouts and rookeries during the non-breeding season. For research on rookeries during the breeding season, observers and remote sensing equipment would need to be placed on sites at times and in such a manner as to avoid disturbing animals. No activities involving capture, restraint, or disturbance of animals on rookeries during the breeding season would be permitted, but disturbance on haulouts for resighting efforts and scat collection could be authorized. It is assumed that, under this alternative, more emphasis would be placed on developing remote sensing and other techniques that allow collection of physiological and nutritional data without capturing animals than under the Status Quo. It is likely that under this alternative there would be a higher amount of survey and observational takes requested compared

to the Status Quo, as researchers would re-allocate funds and other resources away from projects that would not be permitted.

### **2.6.3 Alternative 3 – Status Quo Research Program**

The existing grant and permit process is somewhat flexible in that it can accommodate changes in funding level, management priorities, scientific interests, research techniques, population status, and threats to the populations' recovery. Under the Status Quo process, permits are issued to qualified individuals and institutions to conduct research according to the scope and methods requested in their applications, with permit restrictions and mitigation measures required by the MMPA, ESA, and NMFS implementing regulations. In addition to these statutory and regulatory permit restrictions, the impact of proposed research programs for SSLs must remain at a level below that which would jeopardize the continued existence of the species or result in adverse modification of critical habitat, as required by Section 7 of the ESA.

The scope of research activity conducted under this alternative depends substantially on the amount of funding that is available. Funding for SSL research peaked in 2001 and 2002 due to special congressional appropriations (Section 3.6). Funding levels have decreased since that time and are not expected to reach those levels again in the foreseeable future. For the purposes of this PEIS, the amount of funding and therefore research effort on SSLs will be assumed to have reached peak levels under the permits issued at or before the initiation of scoping for this PEIS. Six of those permits, encompassing the majority of field research on SSLs, were subsequently vacated by court order on May 26, 2006 (Civil Action No. 05-1392 ESH). However, for the purpose of analyzing the effects of that scope of research, the average number, types, and distribution of takes allowed by all permits before the court order will be used for the analysis of effects of this alternative. For NFSs, funding levels have recently increased; therefore, the number, types, and distribution of takes allowed by all permits approved by January 2006 will be used for the analysis of effects under this alternative. This may not represent a peak research effort for NFSs, depending on future funding opportunities and interest among the research community, both of which are linked to factors such as population trends and speculation about the contribution of commercial fisheries and other factors to population status and prospects.

Under the Status Quo alternative, new permits would be issued for the same type and scope of research as occurred under SSL permits that existed before the court order vacated them in May 2006 (Table 2-2). It would also include all other existing permits for research on SSLs and NFSs that were not affected by that order (Appendix A). New permits would be issued to replace permits as they expire such that the levels and types of research activities would continue to the extent that funding allowed. Under Alternative 3, the total amount of incidental mortality allowed under all permits and authorizations would not exceed 10 percent of PBR for each stock (western SSL is 23 animals, eastern SSL is 200, eastern Pacific NFS is 1,526, San Miguel Island NFS is 22).

New requests for permits and amendments to existing permits would be considered on a case-by-case basis and would be granted as long as the applicants satisfied all permit issuance criteria, including having a bona fide research project likely to contribute to the recovery of the depleted, threatened, or endangered species. Under this alternative, each new permit request would be evaluated separately during Section 7 consultation, against the baseline of impacts from whatever permits were in effect at the time of the request. New permits would only be denied if it were determined that issuance would exceed the ESA jeopardy or adverse modification threshold when expected impacts were added to existing research and other activities in the baseline at the time the application was received.

## 2.6.4 Alternative 4 – The Preferred Alternative - Research Program with Full Implementation of Conservation Goals

This alternative would include not only those specific activities currently or previously permitted but any additional research activities or methods that are needed to implement the new SSL Recovery Plan (NMFS 2006a) and the new NFS Conservation Plan (NMFS 2006b), assuming they are consistent with the MMPA, ESA, and NMFS implementing regulations. These plans are discussed in more detail in Sections 3.2.1.13 and 3.2.2.12.

The new 2006 Draft SSL Recovery Plan identifies 78 substantive actions needed to achieve recovery of the western DPS. All recovery actions were prioritized into three categories in the implementation schedule (NMFS 2006a, pp 157) according to joint NMFS and U.S. Fish and Wildlife Service (USFWS) recovery planning guidance (Section 5.1.10 Implementation Schedule in “interim Recovery Planning Guidance” available at [www.nmfs.noaa.gov/pr/laws/esa/policies.htm](http://www.nmfs.noaa.gov/pr/laws/esa/policies.htm)). Priority 1 actions are, by definition, those actions “that must be taken to prevent extinction or to prevent the species from declining irreversibly in the foreseeable future.” Priority 2 actions are defined as those “that must be taken to prevent a significant decline in species population/habitat quality or some other significant impact short of extinction.” Priority 3 actions are defined as “all other actions necessary to provide for full recovery of the species.”

Many of the research activities related to priorities listed in the Draft SSL Recovery Plan have been used by past and current research programs under the Status Quo permits. However, there are some research questions listed in the plan that have not received adequate attention in the past, either because they would require larger budgets than were available or because researchers elected not to attempt them because of the logistical challenges they presented. Some of these research questions may require use of techniques or protocols that have not previously been requested or permitted on SSLs and NFSs. As such, they may involve unique or uncertain risks to the animals. These new techniques or procedures would likely require addition NEPA Analysis.

Under Alternative 4, NMFS would consider proposals for research that posed a higher risk of injury to individual animals, including intentional mortality of animals or other specified individuals, if the permit applicant could demonstrate that the research has a reasonable chance of providing significant data relevant to conservation of the species. Permit issuance criteria under the MMPA and ESA would still prohibit research from putting the species at a disadvantage or in jeopardy. Under Alternative 4, the total amount of incidental mortality allowed under all permits and authorizations would not exceed 15 percent of PBR for each stock (western SSL is 35 animals, eastern SSL is 300, eastern Pacific NFS is 2,289, San Miguel Island NFS is 33).

Regarding the eastern DPS, the Draft SSL Recovery Plan recommended the initiation of a status review to consider removing the eastern DPS from the ESA’s List of Threatened and Endangered Wildlife. If, following the status review, the eastern DPS is delisted, then pursuant to section 4(g) of the ESA the agency is required “in cooperation with the States to monitor effectively for not less than five years the status” of the eastern DPS. Given the long-term increasing population trend and lack of significant conservation threats, the Draft SSL Recovery Plan concludes that, if the eastern DPS is delisted, the primary recovery goal is to develop a post-delisting monitoring plan to ensure re-listing is not necessary after removal. Key components of this plan relative to research activities have not been prioritized in the SSL plan but would be likely to include population-trend monitoring, genetics research to refine population structure, monitoring terrestrial habitat threats, monitoring for unusual mortality events that may be related to contaminants or other human factors, and monitoring fishery management plans to ensure that they stay consistent with SSL requirements. These are activities that have been permitted under the Status Quo and would be considered under Alternative 4.

The Draft NFS Conservation Plan identified 58 tasks needed to achieve recovery of the depleted eastern Pacific stock, as prioritized in the implementation schedule (NMFS 2006b, pp 82). The actions that contain field research components are as follows:

- monitor and manage subsistence harvest;

- identify and evaluate illegal harvests;
- conduct basic studies on fur seal feeding ecology;
- determine impact of fisheries;
- monitor male and pup abundance at Pribilof Islands;
- estimate pup survival;
- evaluate marking and resighting program;
- study vital rates;
- conduct behavioral/physiological studies;
- conduct comparative studies between Pribilof Islands animals and other islands;
- conduct oceanographic and fishery surveys in relation to essential NFS habitat; and
- reevaluate carrying capacity.

Alternative 4 represents an extensive research program that would be able to simultaneously address multiple issues over a huge geographical space. To be fully implemented, such a program would require a much larger research budget than is currently allocated to these species. It would also require greater administrative support for the Grants, Permits, and Regional Offices of NMFS in order to efficiently process the large number of projects. For the purposes of this PEIS, it is assumed that the grants and permits processes will be essentially the same as under the Status Quo. However, if adequate funding were available to implement this expanded research program, it is likely that NMFS would adopt one or more of the measures, discussed in Chapter 5, to expedite the review process and to improve communication and coordination, not only between researchers, but between the various branches of NMFS involved in the research program, the Alaska Native communities affected by research, other federal and state agencies, and the public.

**Table 2.6-2 Alternative Framework**

Classification	Research Activity	Alt. 1: No Action; No New Permits or Authorizations <sup>1</sup>	Alt. 2: Research Program Without Capture or Handling	Alt. 3: Status Quo <sup>2</sup> Research Program	Alt. 4: Research Program with Full Implementation of Conservation Goals <sup>3</sup>
Activities that do not require permits	<i>Analysis of existing data and samples</i>	<ul style="list-style-type: none"> <li>• Grants could be issued for administrative, educational, and research activities that do not require permits</li> </ul>	<ul style="list-style-type: none"> <li>• Grants could be issued for administrative, educational, and research activities that do not require permits and for those where permits would be issued</li> </ul>	<ul style="list-style-type: none"> <li>• Grants could be issued for administrative, educational, and research activities that do not require permits and for those where permits would be issued</li> </ul>	<ul style="list-style-type: none"> <li>• Grants could be issued for administrative, educational, and research activities that do not require permits and for those where permits would be issued</li> </ul>
	<i>Bio-sampling under Co-Management or other agreement with NMFS</i>	<ul style="list-style-type: none"> <li>• Grants could be issued for activities associated with this activity</li> </ul>	<ul style="list-style-type: none"> <li>• Grants could be issued for activities associated with this activity</li> </ul>	<ul style="list-style-type: none"> <li>• Grants could be issued for activities associated with this activity</li> </ul>	<ul style="list-style-type: none"> <li>• Grants could be issued for activities associated with this activity</li> </ul>
Activities that do not involve capture, handling, or collection of tissues from live animals	<i>Aerial surveys</i>	<ul style="list-style-type: none"> <li>• No new permits or authorizations</li> <li>• Grants could be issued and surveys could occur at altitudes that would not result in disturbance or other take</li> </ul>	<ul style="list-style-type: none"> <li>• Surveys at trend sites as needed for stock assessment and population monitoring</li> </ul>	<ul style="list-style-type: none"> <li>• Frequency, location, and protocol (including sample size) determined according to specific research objectives</li> </ul>	<ul style="list-style-type: none"> <li>• Frequency, location, and protocol (including sample size) determined according to specific research objectives</li> <li>• Level of effort higher than Status Quo</li> </ul>
	<i>Vessel-based surveys and observations</i>	<ul style="list-style-type: none"> <li>• No new permits or authorizations</li> <li>• Grants could be issued and surveys or observations could occur at distances or under circumstances that would not result in disturbance or other take</li> </ul>	<ul style="list-style-type: none"> <li>• Timing and location as needed for stock assessment and population monitoring, to support other research activities (e.g. brand resight or behavioral studies), and monitoring effects of research</li> </ul>	<ul style="list-style-type: none"> <li>• Frequency, location, and protocol (including sample size) determined according to specific research objectives</li> </ul>	<ul style="list-style-type: none"> <li>• Frequency, location, and protocol (including sample size) determined according to specific research objectives</li> <li>• Level of effort higher than Status Quo</li> </ul>
	<i>Land-based surveys and observations (includes scat collection, ground counts, operation and maintenance of remote cameras)</i>	<ul style="list-style-type: none"> <li>• No new permits or authorizations</li> <li>• Grants could be issued and surveys, observations, or scat collections could occur at distances or under circumstances that would not result in disturbance or other take</li> </ul>	<ul style="list-style-type: none"> <li>• Timing and location as needed for stock assessment and population monitoring, to support other research activities (e.g. brand resight or behavioral studies), and monitoring effects of research</li> <li>• No disturbance of rookeries during breeding season</li> </ul>	<ul style="list-style-type: none"> <li>• Frequency, location, and protocol (including sample size) determined according to specific research objectives</li> </ul>	<ul style="list-style-type: none"> <li>• Frequency, location, and protocol (including sample size) determined according to specific research objectives</li> <li>• Level of effort higher than Status Quo</li> </ul>

<sup>1</sup> Note that the specifics of research in the No Action column refer to what would or would not be funded or permitted by NMFS as the existing permits and grants expire. All research activities currently funded and permitted would continue unaltered (no amendments or modifications) through their expiration. See the Status Quo for a description of currently funded and permitted research.

<sup>2</sup> Note that the Status Quo of research for this document is defined as the level of research permitted at the time scoping was initiated December 28, 2005. Subsequent to scoping the majority of permits for research on Steller sea lions were vacated by court order. However, for the purpose of analysis and comparison with other alternatives, we will assume that research would be permitted at the pre-court order levels.

<sup>3</sup> This Alternative would include not only those specific activities currently or previously permitted but any additional research activity or method that is consistent with the Acts and Regulations, including new or experimental techniques. Thus, permits could authorize research range-wide, any time of year, by any method proposed, including things not previously permitted.

**Table 2.6-2 (continued) Alternative Framework**

Classification	Research Activity	Alt. 1: No Action; No New Permits or Authorizations <sup>4</sup>	Alt. 2: Research Program Without Capture or Handling	Alt. 3: Status Quo <sup>5</sup> Research Program	Alt. 4: Research Program with Full Implementation of Conservation Goals <sup>6</sup>
Activities that do not involve capture, handling, or collection of tissues from live animals	<i>Receipt and use of tissues from subsistence harvested and stranded animals</i>	<ul style="list-style-type: none"> <li>● Permits could be issued to researchers for receipt and use of samples (no “take” authorized)</li> <li>● Grants could be issued for activities associated with the use of samples</li> </ul>	<ul style="list-style-type: none"> <li>● Permits could be issued to researchers for receipt and use of samples (no “take” authorized)</li> <li>● Grants could be issued for activities associated with the use of samples</li> </ul>	<ul style="list-style-type: none"> <li>● Permits could be issued to researchers for receipt and use of samples (no “take” authorized)</li> <li>● Grants could be issued for activities associated with the use of samples</li> </ul>	<ul style="list-style-type: none"> <li>● Permits could be issued to researchers for receipt and use of samples (no “take” authorized)</li> <li>● Grants could be issued for activities associated with the use of samples</li> </ul>
	<i>Collection and use of tissue samples from predation events and from carcasses found during other research activities</i>	<ul style="list-style-type: none"> <li>● Permits and grants could be issued to researchers for collection and use of samples only under circumstances that would not result in “takes” of live animals</li> </ul>	<ul style="list-style-type: none"> <li>● Permits and grants could be issued to researchers for collection and use of samples under circumstances that would result in disturbance of live animals (assume mitigation measures to minimize incidental disturbance)</li> </ul>	<ul style="list-style-type: none"> <li>● Permits and grants could be issued to researchers for collection and use of samples under circumstances that would result in disturbance of live animals (assume mitigation measures to minimize incidental disturbance)</li> </ul>	<ul style="list-style-type: none"> <li>● Permits and grants could be issued to researchers for collection and use of samples under circumstances that would result in disturbance of live animals (assume mitigation measures to minimize incidental disturbance)</li> </ul>
	<i>Disturbance incidental to research on other species or environmental components</i>	<ul style="list-style-type: none"> <li>● No new permits or authorizations</li> <li>● Grants could be issued for activities that would not require permits</li> </ul>	<ul style="list-style-type: none"> <li>● Allowed and assumed will be kept to minimum by use of mitigation measures for other research activities</li> </ul>	<ul style="list-style-type: none"> <li>● Allowed and assumed will be kept to minimum by use of mitigation measures for other research activities</li> <li>● Numbers likely higher than under Alternatives 1 &amp; 2 due to increased scope of research program</li> </ul>	<ul style="list-style-type: none"> <li>● Allowed and assumed will be kept to minimum by use of mitigation measures for other research activities</li> <li>● Numbers likely higher than under Status Quo due to increased level of effort</li> </ul>

<sup>4</sup> Note that the specifics of research in the No Action column refer to what would or would not be funded or permitted by NMFS as the existing permits and grants expire. All research activities currently funded and permitted would continue unaltered (no amendments or modifications) through their expiration. See the Status Quo for a description of currently funded and permitted research.

<sup>5</sup> Note that the Status Quo of research for this document is defined as the level of research permitted at the time scoping was initiated December 28, 2005. Subsequent to scoping the majority of permits for research on Steller sea lions were vacated by court order. However, for the purpose of analysis and comparison with other alternatives, we will assume that research would be permitted at the pre-court order levels.

<sup>6</sup> This Alternative would include not only those specific activities currently or previously permitted but any additional research activity or method that is consistent with the Acts and Regulations, including new or experimental techniques. Thus, permits could authorize research range-wide, any time of year, by any method proposed, including things not previously permitted.

**Table 2.6-2 (continued) Alternative Framework**

Classification	Research Activity	Alt. 1: No Action; No New Permits or Authorizations <sup>7</sup>	Alt. 2: Research Program Without Capture or Handling	Alt. 3: Status Quo <sup>8</sup> Research Program	Alt. 4: Research Program with Full Implementation of Conservation Goals <sup>9</sup>
Activities that require capture, handling, and/or invasive procedures on wild animals  <i>Note: All alternatives must be consistent with the MMPA and AWA requirements that all research activities must be "humane", defined as "that method of taking which involves the least possible degree of pain and suffering practicable to the mammal involved"</i>	<i>Capture and temporary restraint by various methods (including on land and in water, by physical or chemical means)</i>	<ul style="list-style-type: none"> <li>• No new grants, permits or authorizations issued</li> </ul>	<ul style="list-style-type: none"> <li>• No new grants, permits or authorizations issued</li> </ul>	<ul style="list-style-type: none"> <li>• Number and method of permitted takes determined according to specific research objectives</li> </ul>	<ul style="list-style-type: none"> <li>• Number and method of permitted takes determined according to specific research objectives</li> <li>• Level of effort higher than Status Quo</li> </ul>
	<i>Collect morphometric measurements (includes weigh; measure length/girth; blubber thickness via skin fold caliper or ultrasound)</i>	<ul style="list-style-type: none"> <li>• No new grants, permits or authorizations issued</li> </ul>	<ul style="list-style-type: none"> <li>• No new grants, permits or authorizations issued</li> </ul>	<ul style="list-style-type: none"> <li>• Number and method of permitted takes determined according to specific research objectives</li> </ul>	<ul style="list-style-type: none"> <li>• Number and method of permitted takes determined according to specific research objectives</li> <li>• Level of effort higher than Status Quo</li> </ul>
Activities that require capture, handling, and/or invasive procedures on wild animals	<i>Collect various tissue samples from restrained animals (includes blood, skin, blubber, muscle, teeth, stomach contents, etc.)</i>	<ul style="list-style-type: none"> <li>• No new grants, permits or authorizations issued</li> </ul>	<ul style="list-style-type: none"> <li>• No new grants, permits or authorizations issued</li> </ul>	<ul style="list-style-type: none"> <li>• Number and method of permitted takes determined according to specific research objectives</li> </ul>	<ul style="list-style-type: none"> <li>• Number and method of permitted takes determined according to specific research objectives</li> <li>• Level of effort higher than Status Quo</li> </ul>
	<i>Apply various marks (includes temporary and permanent)</i>	<ul style="list-style-type: none"> <li>• No new grants, permits or authorizations issued</li> </ul>	<ul style="list-style-type: none"> <li>• No new grants, permits or authorizations issued</li> </ul>	<ul style="list-style-type: none"> <li>• Number and method of permitted takes determined according to specific research objectives</li> </ul>	<ul style="list-style-type: none"> <li>• Number and method of permitted takes determined according to specific research objectives</li> <li>• Level of effort higher than Status Quo</li> </ul>

<sup>7</sup> Note that the specifics of research in the No Action column refer to what would or would not be funded or permitted by NMFS as the existing permits and grants expire. All research activities currently funded and permitted would continue unaltered (no amendments or modifications) through their expiration. See the Status Quo for a description of currently funded and permitted research.

<sup>8</sup> Note that the Status Quo of research for this document is defined as the level of research permitted at the time scoping was initiated December 28, 2005. Subsequent to scoping the majority of permits for research on Steller sea lions were vacated by court order. However, for the purpose of analysis and comparison with other alternatives, we will assume that research would be permitted at the pre-court order levels.

<sup>9</sup> This Alternative would include not only those specific activities currently or previously permitted but any additional research activity or method that is consistent with the Acts and Regulations, including new or experimental techniques. Thus, permits could authorize research range-wide, any time of year, by any method proposed, including things not previously permitted.

**Table 2.6-2 (continued) Alternative Framework**

Classification	Research Activity	Alt. 1: No Action; No New Permits or Authorizations <sup>10</sup>	Alt. 2: Research Program Without Capture or Handling	Alt. 3: Status Quo <sup>11</sup> Research Program	Alt. 4: Research Program with Full Implementation of Conservation Goals <sup>12</sup>
Activities that require capture, handling, and/or invasive procedures on wild animals	<i>Apply various scientific instruments (internal and external)</i>	● No new grants, permits or authorizations issued	● No new grants, permits or authorizations issued	● Number and method of permitted takes determined according to specific research objectives	● Number and method of permitted takes determined according to specific research objectives ● Level of effort higher than Status Quo
	<i>Collect body composition measurements (includes BIA, labeled isotopes, metabolic chamber)</i>	● No new grants, permits or authorizations issued	● No new grants, permits or authorizations issued	● Number and method of permitted takes determined according to specific research objectives	● Number and method of permitted takes determined according to specific research objectives ● Level of effort higher than Status Quo
	<i>Injection of drugs or chemicals other than for sedation/anesthesia/analgesia (e.g. Evans blue dye, labeled isotopes, other bio-markers)</i>	● No new grants, permits or authorizations issued	● No new grants, permits or authorizations issued	● Number and method of permitted takes determined according to specific research objectives	● Number and method of permitted takes determined according to specific research objectives ● Level of effort higher than Status Quo
Activities that require capture, handling, and/or invasive procedures on wild animals	<i>Remote collection of tissue samples</i>	● No new grants, permits or authorizations issued	● No new grants, permits or authorizations issued	● Number and method of permitted takes determined according to specific research objectives	● Number and method of permitted takes determined according to specific research objectives ● Level of effort higher than Status Quo
	<i>Temporary removal from the wild and short-term captivity for research activities</i>	● No new grants, permits or authorizations issued	● No new grants, permits or authorizations issued	● Number and method of permitted takes determined according to specific research objectives	● Number and method of permitted takes determined according to specific research objectives ● Level of effort higher than Status Quo

<sup>10</sup> Note that the specifics of research in the No Action column refer to what would or would not be funded or permitted by NMFS as the existing permits and grants expire. All research activities currently funded and permitted would continue unaltered (no amendments or modifications) through their expiration. See the Status Quo for a description of currently funded and permitted research.

<sup>11</sup> Note that the Status Quo of research for this document is defined as the level of research permitted at the time scoping was initiated December 28, 2005. Subsequent to scoping the majority of permits for research on Steller sea lions were vacated by court order. However, for the purpose of analysis and comparison with other alternatives, we will assume that research would be permitted at the pre-court order levels.

<sup>12</sup> This Alternative would include not only those specific activities currently or previously permitted but any additional research activity or method that is consistent with the Acts and Regulations, including new or experimental techniques. Thus, permits could authorize research range-wide, any time of year, by any method proposed, including things not previously permitted.



**Table 2.6-2 (continued) Alternative Framework**

Classification	Research Activity	Alt. 1: No Action; No New Permits or Authorizations <sup>13</sup>	Alt. 2: Research Program Without Capture or Handling	Alt. 3: Status Quo <sup>14</sup> Research Program	Alt. 4: Research Program with Full Implementation of Conservation Goals <sup>15</sup>
Activities that require capture, handling, and/or invasive procedures on wild animals	<i>Maintenance and husbandry of captive animals (temporary and permanent captivity, including propagation for purposes of studies on reproduction and growth – no release of progeny)</i>	<ul style="list-style-type: none"> <li>• No new grants, permits or authorizations issued. Animals currently held under research or enhancement permits could continue to be maintained but no breeding could occur</li> </ul>	<ul style="list-style-type: none"> <li>• Grants and permits could be issued for captive propagation provided appropriate justification given relative to achieving information related to species recovery</li> </ul>	<ul style="list-style-type: none"> <li>• Grants and permits could be issued for captive propagation provided appropriate justification given relative to achieving information related to species recovery</li> </ul>	<ul style="list-style-type: none"> <li>• Grants and permits could be issued for captive propagation provided appropriate justification given relative to achieving information related to species recovery</li> <li>• Level of effort higher than Status Quo</li> </ul>
Potential direct and indirect mortality from research  <i>Note: Under no alternative would NMFS permit levels of mortality that would likely disadvantage or jeopardize populations or adversely impact stocks</i>	<i>Mortality incidental to research activities (includes mortality due to disturbance effects plus mortality related to capture and handling of animals)</i>	<ul style="list-style-type: none"> <li>• No new permits or authorizations</li> <li>• Grants could be issued for activities that would not require permits</li> </ul>	<ul style="list-style-type: none"> <li>• Allowed and assumed will be kept to minimum by use of mitigation measures for other research activities</li> </ul>	<ul style="list-style-type: none"> <li>• Allowed and assumed will be kept to minimum by use of mitigation measures for other research activities</li> <li>• Numbers likely higher than under Alternatives 1 &amp; 2 due to increased scope of research program</li> </ul>	<ul style="list-style-type: none"> <li>• Allowed and assumed will be kept to minimum by use of mitigation measures for other research activities</li> <li>• Numbers likely higher than under Status Quo due to increased level of effort</li> </ul>
	<i>Intentional lethal collection and permanent removal of animals from the wild for research or enhancement activities</i>	<ul style="list-style-type: none"> <li>• No new grants, permits or authorizations issued</li> </ul>	<ul style="list-style-type: none"> <li>• No new grants, permits or authorizations issued</li> </ul>	<ul style="list-style-type: none"> <li>• No new grants, permits or authorizations issued</li> </ul>	<ul style="list-style-type: none"> <li>• Number and method of permitted takes determined according to specific research objectives</li> <li>• Level of effort higher than Status Quo</li> </ul>
Potential direct and indirect mortality from research	<i>Threshold level of total potential mortality authorized (incidental and intentional mortality combined)</i>	<ul style="list-style-type: none"> <li>• No incidental or intentional mortality permitted or authorized for any stock</li> </ul>	<ul style="list-style-type: none"> <li>• Permits and authorizations for incidental mortality not to exceed 5% of PBR<sup>16</sup> for each stock (WSSL=12 animals, ESSL=100, EPNFS=763, SMINFS=11)</li> </ul>	<ul style="list-style-type: none"> <li>• Permits and authorizations for incidental mortality not to exceed 10% of PBR for each stock (WSSL=23 animals, ESSL=200, EPNFS=1,526, SMINFS=22)</li> </ul>	<ul style="list-style-type: none"> <li>• Permits and authorizations for incidental and intentional mortality not to exceed 15% of PBR for each stock (WSSL=35 animals, ESSL=300, EPNFS=2,289, SMINFS=33)</li> </ul>

<sup>13</sup> Note that the specifics of research in the No Action column refer to what would or would not be funded or permitted by NMFS as the existing permits and grants expire. All research activities currently funded and permitted would continue unaltered (no amendments or modifications) through their expiration. See the Status Quo for a description of currently funded and permitted research.

<sup>14</sup> Note that the Status Quo of research for this document is defined as the level of research permitted at the time scoping was initiated. Subsequent to scoping the majority of permits for research on Steller sea lions were vacated by court order. However, for the purpose of analysis and comparison with other alternatives, we will assume that research would be permitted at the pre-court order levels.

<sup>15</sup> This Alternative would include not only those specific activities currently or previously permitted but any additional research activity or method that is consistent with the Acts and Regulations, including new or experimental techniques. Thus, permits could authorize research range-wide, any time of year, by any method proposed, including things not previously permitted.

<sup>16</sup> Potential Biological Removal (PBR) is defined in the MMPA as the product of the minimum population estimate, one-half the maximum theoretical net productivity rate, and a recovery factor based on the status of the stock. Based on the most recent stock assessment data (Angliss and Outlaw 2007, Carretta *et al.* 2007), PBR for the endangered western DPS of SSL (WSSL) = 234 animals; PBR for the threatened eastern DPS of SSL (ESSL) = 2,000 animals; PBR for the depleted eastern Pacific stock of NFS (EPNFS) = 15,262 animals; and PBR for the San Miguel Island stock of NFS (SMINFS) = 219 animals.

## **2.7 Alternatives Not Carried Forward for Analysis**

The alternatives considered in this PEIS range from allowing only research activities that do not require a permit (Alternative 1) to allowing an expanded research policy associated with full implementation of recovery and conservation plan objectives (Alternative 4). All of these alternatives would be consistent with NMFS current statutory and regulatory authority. A number of additional potential alternatives were considered but not carried forward for analysis, due to reasons described below.

### **2.7.1 Fisheries Modifications**

Comments were submitted during scoping and for the Draft PEIS requesting alternatives that prohibited fishing or encourage adaptive experimental approaches to fishing in order to reduce fishing related effects on SSLs and NFSs. This PEIS is related to research directed at SSL and NFS, pursuant to Sections 104 of the MMPA and 10(a)(1)(A) of the ESA. Other types of studies, such as experimental fishing or oceanographic research, are not within the scope of the directed research program that is being evaluated in this PEIS.

### **2.7.2 Research Moratorium**

As described in Chapter 1, NMFS is responsible for management, conservation, and protection of SSLs under the ESA (16 U.S.C. 1531 *et seq.*) and the MMPA (16 U.S.C. 1361 *et seq.*), and NFSs under the MMPA. NFSs in the Pribilof Islands are also managed under the Fur Seal Act of 1966 (16 U.S.C. 1151 *et seq.*). A research moratorium, which would involve not allowing any research and revoking all active research permits, was not carried forward because it would not be consistent with NMFS legal mandates to monitor the status of marine mammals and recover threatened and endangered species. A permanent “no research permit” policy would end most research activities directed at SSLs and NFSs and compromise NMFS ability to monitor distribution and abundance of the species, as mandated under section 117 of the MMPA. Without some level of research surveys, NMFS would not be able to monitor the status of the endangered population, nor assess whether or not protective measures, such as regulations prohibiting fishing in critical habitat, were achieving the desired effect of recovery of the species.

### **2.7.3 Structuring Alternatives on Conservation and Recovery Plan Priorities**

Currently, all researchers must identify how their permit applications address the objectives of the Conservation and Recovery Plans. This information is reviewed by NMFS and by the public during the permit comment period. This requirement would remain common to all alternatives. The new Conservation and Recovery Plans are currently in a draft stage, and are being revised based on public comments. NMFS does not support formally tying alternatives to Plan priorities that may change or become outdated by changes in stock status. However, NMFS agrees with suggestions that a research implementation plan for SSLs and NFSs should be developed, and that part of its framework should be prioritizing goals and guiding research in accordance with the Recovery and Conservation Plans.

### **2.7.4 Structuring Alternatives on Spatial and Temporal Considerations**

Suggestions were made to structure alternatives to vary the temporal and spatial intensity of research effort, partly over concerns about duplicative research efforts and concentrating research effects in specific areas. Some research is purposefully concentrated in specific areas, with multiple visits in order to maximize useful data collection and establish trend information. In other cases, specific locations for research activities are picked based on cost, logistical, and safety considerations. Researchers currently coordinate field activities on a voluntary basis prior to initiation of field work, and NMFS is recommending steps for formal coordination requirements in Chapter 5. For these reasons, NMFS eliminated this potential alternative structure for research.

### **2.7.5 Research Not Consistent with Governing Laws and Regulations**

Alternatives that would allow research not consistent with the requirements of the MMPA and ESA, or with NMFS implementing regulations, were also not carried forward because they would not meet the minimum environmental standards established by these laws, or would require revision of the statutes by Congress. For example, an alternative that would allow researchers to conduct research using methods that would not meet the humane standard under the MMPA or would not be likely to contribute to conservation of the endangered species that was the subject of the permit, as required by the ESA, was not considered further because it would not meet these minimum requirements of the statutes governing research on protected species. Similarly, an alternative that would allow research permits to be issued for an indefinite time period, or for longer than five years, was not carried forward because it would not meet the minimum requirements for permits as currently stipulated in NMFS implementing regulations. It is not within the scope of this EIS to address the substantial impediments to changing the governing laws (i.e., ESA, MMPA, and NEPA) and regulations concerning research on marine mammals.

### **2.8 Environmentally Preferred Alternative**

The environmentally preferred alternative (40 CFR 1505.2[b]) will promote the national environmental policy as expressed in Section 101 of NEPA. This is often characterized as the alternative that causes the least damage to the physical and biological environment and is the alternative that best protects, preserves, and enhances historic, cultural, and natural resources. In this case, Alternative 2 - Research Program without Capture or Handling is considered the environmentally preferred alternative because intrusive research on SSLs and NFSs would not be authorized, but some level of non-intrusive research would continue to allow for collection of information on the distribution and abundance of SSL and NFS stocks. Thus, SSLs and NFSs would be subject to a minimum of research activities that could potentially harass, injure, or kill them. However, it should be recognized that data collected from research under other alternatives could provide important information on the status of these species allowing NMFS to better meet its obligations to promote recovery of SSLs under the ESA (16 U.S.C. 1531 *et seq.*) and MMPA (16 U.S.C. 1361 *et seq.*), and NFSs under the MMPA. The types of information that could be collected under Alternative 2 would be limited compared to alternatives where permits could be issued for capture and sampling. For example, without collection of tissue samples, NMFS would not have information on the incidence or types of disease present in these populations, nor could NMFS determine or monitor variations in population genetics that might be relevant to delineating stocks for management purposes. Thus, while Alternative 2 may initially benefit SSLs and NFSs by eliminating some harassment, injury, or potential mortality due to research activities, the Research Program without Capture or Handling Alternative could hinder NMFS' ability to conserve or recover these marine mammal populations by limiting collection of information needed for management.

### **2.9 The Preferred Alternative**

NMFS has chosen Alternative 4 as the Preferred Alternative in this Final PEIS. The approach outlined in Alternative 4 allows the agency to fully implement the recommendations in the species' conservation and recovery plans. Full implementation of the plans would lead to a better understanding of these species, more informed management decisions and, hence, a more promising prospect of recovery.