

**Steller Sea Lion and Northern Fur Seal Research Draft Programmatic Environmental Impact  
Statement**

**February 2007**

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# EXECUTIVE SUMMARY

## 1.0 Introduction

This executive summary provides an overview of the findings contained in the Steller Sea Lion (SSL) and Northern Fur Seal (NFS) Research Programmatic Environmental Impact Statement (EIS). This programmatic EIS evaluates the effects of the type and range of SSL and NFS research activities (*i.e.*, the alternative actions) that may be exercised in current and future grants and EIS will assess the direct and indirect effects of various levels of funding and different research techniques on SSLs and NFSs throughout the entire range of these species in U.S. waters and on the high seas, which includes parts of Alaska, Washington, Oregon, and California. The effects of research on these species as well as other components of the marine ecosystem and human environment are presented. The EIS assesses the contribution of research activities to the cumulative effects on these species and resources, including effects from past, present, and reasonably foreseeable future events and activities that are external to the research activities.

The National Oceanic and Atmospheric Administration's (NOAA) National Marine Fisheries Service (NMFS) is responsible for management, conservation, and protection of Steller sea lions (SSLs), *Eumetopias jubatus*, under the Endangered Species Act (ESA) (ESA; 16 U.S.C. 1531 et seq.) and the Marine Mammal Protection Act (MMPA) (MMPA; 16 U.S.C. 1361 et seq.) and northern fur seals (NFSs), *Callorhinus ursinus*, under the MMPA. Northern fur seals in the Pribilof Islands are also managed under the Fur Seal Act of 1966 (16 U.S.C. 1151 et seq.).

In 1990, NMFS listed SSLs as "threatened" under the ESA, and in 1997 they recognized two distinct population segments (DPS): the western DPS and eastern DPS. The segment of the population west of 144° W longitude was listed as "endangered", while the segment of the population east of this delineation remained listed as "threatened". Both DPSs of SSLs are listed as depleted stocks under the MMPA. Northern fur seals, recognized as two distinct stocks (Eastern Pacific and San Miguel Island), have never been listed under the ESA but the Eastern Pacific stock was listed as "depleted" in 1988 (then as the Pribilof Island population) under the MMPA. For a project area map, please see Figure 1.4-1.

## 2.0 Proposed Action

NMFS administers a research program that includes (1) directed grants from the Alaska Region's operational budget, (2) "pass-through" grants detailed in the federal budget, and (3) permits issued pursuant to the MMPA and ESA for the purpose of facilitating research on SSLs and NFSs in lands and waters under U.S. jurisdiction. Most research activities on these species require permits, which NMFS administers to qualified individuals and institutions from the Office of Protected Resources, Permits Division (F/PR1). Permits are granted provided the proposed research activities are consistent with the requirements of the ESA, MMPA and the criteria in NMFS implementing regulations (50 CFR parts 216 and 222). The proposed action is to disburse federal funds and issue permits for research on SSLs and NFSs, consistent with applicable federal laws.

## 3.0 Purpose and Need

The purpose of the research on SSL and NFS, as stated in the SSL Recovery Plan (NMFS 1992) and NFS Conservation Plan (NFMS 1993), is to promote the recovery of the species' populations to levels appropriate to justify removal from ESA listings (SSL) and to delineate reasonable actions to protect the depleted species under MMPA. NMFS awards grants to support research on SSL and NFS, and issues permits to allow an exemption to the prohibition on "takes" of SSLs and NFSs, established under the ESA and MMPA. The ESA and the MMPA prohibit "takes" of threatened and endangered species, and of marine mammals, respectively. Many research activities, including aerial and vessel-based surveys, tagging and marking procedures, attachment of scientific instruments, and collection of tissue samples, require approaching or capturing animals and may result in harassment or other acts otherwise prohibited under the ESA and MMPA.

The purpose of the analysis contained in this EIS is to assess the effects of research activities on SSL and NFS populations and components of the marine ecosystem and human environment.

The project is needed to:

- Address NMFS' responsibility to implement the ESA and MMPA for species under its jurisdiction, including SSLs and NFSs, to: (1) promote recovery; (2) identify factors limiting the population; (3) identify reasonable actions to minimize impacts of human-induced activities; and (4) implement conservation and management measures.
- Satisfy NMFS' obligations under NEPA by analyzing the environmental consequences of research it funds and authorizes on SSLs and NFSs, sharing and soliciting public comments on this information, and providing the basis for NMFS research grant and permit decisions.

At present, 23 active grants fund research projects that involve human interaction with SSLs. All active and anticipated SSL research funded by past, present, and expected future federal grants are covered by this EIS document. Research activities taking place under active grants range from actions such as aerial surveys, which could disturb individual SSLs, to the capture of sample populations, for collection of blood and tissue samples. A description of permits valid between January 1, 2006 and December 31, 2011 may be found in Appendix A of this EIS. Together, these permits currently authorize takes of SSLs throughout their range in the U.S. by a variety of research activities. In addition to authorizing various studies, the permits allow for the mortality of up to 60 SSLs per year incidental to research activities, not to exceed 18 SSLs from the western population. Applications for additional permits for studies of SSLs using these and other methods are anticipated for at least as long as this species is listed under the ESA. Further, NMFS has an ongoing obligation under Section 117 of the MMPA to prepare stock assessments for each marine mammal stock in waters under the jurisdiction of the US. These stock assessments, which must describe the geographic range, minimum population estimate, current and net productivity rates, annual human-caused mortality and serious injury, and other factors that may be causing a decline or impeding recovery, are largely dependent upon information obtained from activities conducted under research permits. Thus, NMFS anticipates a need to continue to issue permits for research on SSLs for as long as this requirement of the MMPA holds.

Consistent with the purpose of the MMPA (16 U.S.C. 1361 *et seq.*), the purpose of conducting research on NFSs is to contribute to the basic knowledge of marine mammal biology and ecology and to identify, evaluate, or resolve conservation problems for the species. Research needs for conservation of this species are identified in the NFS Conservation Plan. Currently, the Alaska Region has not made any specific grant awards for NFS research. However, one pass-through SSL grant does support a small NFS study. Six permits or authorizations are currently active for research directed at NFS in the wild and are valid through October 1, 2010. Active permits for research on NFSs in the wild, valid through October 1, 2010, may be found in Appendix A of this EIS. The active permits authorize takes of NFSs in California, and in Alaska on the Pribilof Islands and Bogoslof Island. As with SSLs, these permits authorize a variety of research activities ranging from vessel or aerial surveys that may disturb animals, to capture and sampling of animals, which may result in injury or incidental mortality. Applications for additional permits for studies of NFSs using these and other methods are anticipated for as long as there is concern about the population status and potential impacts of human activities, and general interest in studies of the species biology and ecology. Further, as with SSLs, NMFS has an ongoing obligation under Section 117 of the MMPA to prepare stock assessments for each marine mammal stock in waters under the jurisdiction of the US and therefore anticipates a need to continue to issue permits for research on NFSs for as long as this requirement of the MMPA holds.

#### **4.0 Issues Raised During Scoping and Where They Are Addressed**

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 EIS 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 EIS; however, the exact structure and number of alternatives were developed after the scoping process was complete.

Three scoping meetings were held early in the project to disseminate information to the public and obtain public input. The public comment period for scoping comments ran for 60 days (between December 28, 2005 and February 25, 2006, inclusive). The locations and dates for the scoping meetings were: Silver Spring, Maryland (January 18, 2006); Seattle, Washington (January 20, 2006); and Anchorage, Alaska (January 23, 2006). A brief summary of the substantive issues raised during public scoping is presented in more detail in Section 2.2. A more complete summary of formal comments is included in the Scoping Summary Report, attached as Appendix D. 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 EIS.

**Table ES-1. Issues Raised in the NOI and Scoping Comments and Where They Are Discussed in the EIS**

ISSUE	SECTIONS IN THE EIS 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 E 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 E 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 G 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]; Appendix C 2006 Draft SSL Recovery Plan and 2006 Draft NFS Conservation Plan
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 E 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 ES-1. Issues Raised in the NOI and Scoping Comments and Where They Are Discussed in the EIS**

ISSUE	SECTIONS IN THE EIS 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 EIS.
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 E 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 EIS; 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 E 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 E 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 ES-1. Issues Raised in the NOI and Scoping Comments and Where They Are Discussed in the EIS**

ISSUE	SECTIONS IN THE EIS 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

In addition to scoping, NMFS also conducted a series of focus group meetings in July and August 2006 with various agencies, researchers, Native Alaskan 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.

## 5.0 Alternatives

Four alternatives were developed and are analyzed in this EIS; they are described in more detail in Chapter 2. The alternatives represent a reasonable range of research granting and permitting options that fulfill the purpose and need for the federal action, described in more detail in Chapter 1. The general policy direction of each alternative is described, followed by Table ES-2, which summarizes examples of specific research activities permitted under each alternative.

There are a number of activities that do not require the types of research permits that are the subject of this EIS, 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 and are described in more detail in Section 2.4.1. There would be no impact on grant programs related to these types of activities under any of 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). Scientific research permits issued by NMFS pursuant to these 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. Under any of the alternatives, 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 or from animals that have been found dead (stranded) due to other causes.

A number of issues were raised by various stakeholders with regard to process and procedures associated with coordinating, conducting, and reporting on research activities. Though not specifically identified as elements of the alternatives, these issues and a discussion on how this programmatic EIS will help guide future NEPA compliance, are discussed in Chapter 5.

### Alternative 1 – No Action: No New Permits or Authorizations

Under Alternative 1, no incidental or intentional mortality due to research activities would be authorized. The No Action Alternative would only allow research activities on SSLs and NFSs that either do not require a permit (i.e., do not result in takes of SSLs and NFSs) or are currently allowed under permits that have not been vacated by the May 26, 2006 court order (Civil Action No. 05-1392 ESH). 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 cease.



This alternative would allow researchers to only use techniques that do not disturb animals in the wild, in order to monitor the populations and collect information pertinent to their recovery. Research under this alternative would not involve approaching or capturing animals to collect data. Research techniques could include remote sensing, 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 and for receipt and use of tissues from animals that have been found dead (stranded) due to other causes.

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. There would be no change in geographic restrictions, such as the 3 nautical miles (nm) no approach buffer areas near rookery sites and the one-half statutory mile on land. These geographic restrictions are described in detail in Chapter 2 of this document.

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

The policy direction of this alternative would be to issue permits and provide grant support to conduct research on SSLs and NFSs using methods that do not involve capture, restraint, tissue sampling, or risk causing animals to leave rookeries during the breeding season. This restriction on intrusive activities would essentially limit research to census 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 potential biological removal (PBR) for each stock. No intentional lethal take would be authorized under Alternative 2.

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 allowed 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. Under this alternative it is assumed that the same level of non-intrusive activity for research on other marine mammal species, especially other pinnipeds such as California sea lions, as under the status quo alternative would occur.

#### Alternative 3 – Status Quo Research Program

Under the status quo process, permits are issued to conduct research according to the scope and methods requested in the permit applications, with restrictions and mitigation measures required by the MMPA, ESA, and NMFS implementing regulations. Alternative 3 would implement the existing grant and permit process, which flexibly accommodates changes in funding levels, management priorities, scientific interests, research techniques, population status, and threats to the populations' recovery. Proposed research programs for SSLs must have impacts 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 activities conducted under this alternative depends substantially on the amount of funding that is available. Funding for SSL research peaked in 2001 and 2002, but has since decreased. For the purposes of this EIS, the amount of funding and level of associated research on SSLs will be assumed to have reached peak levels under the permits issued at or before the initiation of this EIS. 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. A peak funding and permit level likely has not been met for NFSs. Funding levels for research on NFSs have recently increased, as has interest in obtaining permits for research on this species. 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, funding for research on NFSs may increase over time. However, new permits have not been issued, pending completion of this EIS. Thus, for this analysis we have used the number, types, and distribution of takes allowed by all permits approved by January 2006.

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. It would also include all other existing permits for research on SSLs and NFSs that were not affected by that order (see 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 population.

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 that was likely to contribute to 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. Consistent with the status quo process for issuing permits, permits would only be denied if it were determined that issuance would exceed the ESA jeopardy or adverse modification threshold when impacts were added to existing research and other activities in the baseline at the time the application was received.

#### 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 revised Draft SSL Recovery Plan (NMFS 2006a) and the new revised Draft 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 and 3.2.2 and are included in their entirety in Appendix C.

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, at least for certain sex/age classes. 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.

Under Alternative 4, NMFS would consider proposals for research that posed a higher risk of injury to individual animals, including intentional lethal take of moribund animals or other specified individuals, if the permit applicant could demonstrate that the research had 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 population.

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. Key components of this plan relative to research activities have not been prioritized in the SSL plan but would likely 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 of 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.

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 process the large number of projects efficiently. For the purposes of this EIS, it is assumed that the grants and permits processes will be essentially the same as under the status quo. However, if adequate funding was 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.

As the Preferred Alternative, this approach 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 the prospect of recovery.

**Table ES-2. Research activities allowed under each alternative**

Research Activities	Alternative 1 – No Action	Alternative 2 – Research Program Without Capture or Handling	Alternative 3 – Status Quo Research Program	Alternative 4 – The Preferred Alternative - Research Program with full Implementation of Conservation Goals
Research activities on live animals with NO capture, restraint, or collection of tissues				
Aerial surveys	*	X	X	X
Vessel surveys	*	X	X	X
Ground surveys	*	X	X	X
Scat collection	*	X	X	X
Remote video/photographic monitoring	*	X	X	X
Receipt of tissue samples from Alaska Natives that have taken the animal legally for subsistence harvest	X	X	X	X
Receipt of tissue samples from animals found dead from other causes	X	X	X	X
Research activities on live animals that requires capture, restraint, or collection of tissues				
Collection of morphometric measurements	--	--	X	X
Collection of blood samples	--	--	X	X
Muscle biopsies	--	--	X	X
Skin biopsies	--	--	X	X
Blubber biopsies	--	--	X	X
Fecal loops and culture swabs	--	--	X	X
Extraction of pre-molar teeth	--	--	X	X
Collection of vibrissae, hair, and nails	--	--	X	X
Enema or stomach intubation	--	--	X	X
Body composition analyses, e.g., Bioelectric Impedance Analysis	--	--	X	X
Ultrasound and x-rays	--	--	X	X
Injection of Chemicals (e.g., stable isotopes, D2O, chromic oxide, Evans blue dye, Co-EDTA, etc.)	--	--	X	X
Temporary and permanent marking	--	--	X	X
Attachment (external) of scientific instruments measurements	--	--	X	X
Insertion/implantation (internal) of instruments	--	--	X	X
Temporary captivity and associated studies	--	--	X	X
Intentional lethal take of moribund animals	--	--		X

KEY: \* indicates activities conducted only in a manner that avoids take; -- indicates activities that would not be authorized; X indicates activities that would be authorized.

### Alternatives Not Carried Forward for Analysis

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” policy would end all research activities and compromise NMFS’ ability to monitor distribution and abundance of the species. Without some level of research surveys, NMFS would not be able to monitor the status of the endangered population, nor assess whether protective measures, such as regulations prohibiting fishing in critical habitat, were achieving the desired effect on recovery of the species.

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 the 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.

## **6.0 Summary of Environmental Consequences**

### Alternative 1 – No Action: No New Permits or Authorizations

Alternative 1 would allow continuation of research that is currently authorized until the existing permits expire. After existing permits expire, no new research permits or authorizations would be issued. Research would be limited to those methods that do not result in “takes” of marine mammals, such as remote surveys and observations and analysis of existing data and samples. Thus, once existing permits expire, no animals in the wild would be exposed to researcher activity under this alternative. Total mortality is estimated to be zero under this alternative.

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

Alternative 2 would prohibit any research activities that require capturing and handling of animals or researcher presence on rookeries during the breeding season (i.e. no intrusive research, where intrusive is defined at 50 CFR 216.3). With the restrictions on authorized research methods, researchers may choose to expand their efforts with non-intrusive techniques or may elect not to pursue research on SSLs and NFSs. In other words, the level of non-intrusive research authorized could be more or less than the status quo, depending on the response of individual researchers and agencies to the policy represented in this alternative. For the purposes of analysis, the number of takes under each research activity will be defined as the numbers of animals affected by non-intrusive research activities under the status quo for those activities (see mortality assessment Tables 4.8-1, -2, -13, -14, -25, -26, -37, and -38).

### Alternative 3 – Status Quo Research Program

For Alternative 3, the numbers of animals exposed to different research activities is taken directly from the permits that were valid on January 1, 2006, including those permits that were subsequently vacated by court order on May 26, 2006 (Civil Action No. 05-1392 [see mortality assessment Tables 4.8-3 through 4.8-7, 4.8-15 through 4.8-19, 4.8-27 through 4.8-31, and 4.8-39 through 4.8-43]). It does not include activities that had been applied for (permits or amendments) but not yet authorized at the time this EIS was initiated.

For survey and monitoring types of activities, the number of animals that would be exposed to potential disturbance depends on how many animals will be in a particular place at a particular time. To account for potential interannual variation in the distribution and abundance of animals within a survey area, researchers are encouraged to estimate the maximum number of animals that would be exposed (surveyed). Researchers generally estimate this number based on information in Stock Assessment Reports (SARs) and previous experience. When applying for permits, researchers may add a “buffer” to this maximum number of animals to make sure they do not exceed their permit allowance should the actual number of animals encountered be greater than predicted.

For some activities, such as capture of juveniles at sea, researchers have applied for and received permits to capture a specific number of animals. However, due to financial constraints or the logistical difficulty of capturing animals, the actual sample size has been less than the number authorized. For procedures that are intended to test specific hypotheses or provide statistically robust data for modeling or other applications, the number of animals requested to be captured or sampled may be based on a “power analysis” determination of sample size. Such statistical power calculations depend on the level of statistical resolution needed to either test the hypothesis or detect an environmental pattern (the effect). In all cases, the analysis of effects will be based on the number of takes authorized in the permits rather than the number of actual takes reported after the field season.

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

Alternative 4 includes all research activities that would be needed to address all information objectives identified in the Draft Revised Recovery Plan for SSL (NMFS 2006). While such a program would likely require a substantial increase in future funding levels and the sources of that funding have not yet been established, it will be assumed for the purposes of this EIS analysis that sufficient funding would be secured to implement an expanded research program under Alternative 4.

This alternative would include the same types of research as described in the status quo plus activities that have not been authorized under the status quo, including new permits and permit amendments that were pending as of January 2006. It could also include some types of techniques and activities that have not been previously requested or authorized, including intentional lethal take. The scope of research required to address all Recovery Plan objectives has been estimated by NMML (see mortality assessment Tables 4.8-8 through 4.8-12, 4.8-20 through 4.8-24, 4.8-32 through 4.8-36, and 4.8-44 through 4.8-48) and is used in this analysis as a proxy for the scope of proposals that would arise from many sources under a favorable funding environment.

Table ES-3 provides summaries of the environmental consequences of the alternatives on biological and socioeconomic resources analyzed in this programmatic EIS.

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**Table ES-3  
Summary of Direct/Indirect and Cumulative Effects SSL - western DPS - Section 4.8.1.1**

Effect		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 (Preferred Alternative) Research Program with Full Implementation of Conservation Goals
Direct/Indirect	Mortality	<ul style="list-style-type: none"> <li>There would be no research activities that affect SSLs in the wild under this alternative so there would be no mechanism for research-related injury or mortality.</li> </ul>	<ul style="list-style-type: none"> <li>Estimated mortality from research activities under Alternative 2 is 4.8 SSLs per year which is 2.1% of PBR. The magnitude/intensity of the effects from mortality is considered "negligible" on the population level.</li> <li>Research would be conducted across the geographic range of the population and the effects would be distributed across the population.</li> <li>Disturbance effects are considered likely given current research techniques but they would only affect individual animals intermittently or infrequently and are therefore considered to be minor in duration.</li> </ul>	<ul style="list-style-type: none"> <li>Estimated mortality from research activities under Alternative 3 is 16.5 SSLs per year which is 7.1% of PBR. The magnitude/intensity of the effects from mortality is considered "negligible" on the population level.</li> <li>Research would be conducted across the geographic range of the population and the effects would be distributed across the population.</li> <li>Disturbance effects that lead to mortality are likely to occur given the current knowledge of research techniques used.</li> <li>Although exposure may be brief, individual animals could be affected by different research activities more than four times per year and they are therefore considered to be moderate in frequency.</li> </ul>	<ul style="list-style-type: none"> <li>Estimated mortality from research activities Alternative 4 is 34.6 SSLs per year which is 14.98% of PBR. The magnitude/intensity of the effects from mortality is considered "minor" on the population level.</li> <li>The research would be conducted across the geographic range of the population and the effects of mortality would be distributed across the population.</li> <li>Disturbance effects that lead to mortality are likely to occur given the current knowledge of research techniques used.</li> <li>Although each exposure may be brief, individual animals could be affected by different research activities more than five or six times per year and they are therefore considered to be moderate in frequency.</li> </ul>
	Sub-lethal Effects	<ul style="list-style-type: none"> <li>There would be no mechanism for research-related injury and therefore no sub-lethal effects.</li> </ul>	<ul style="list-style-type: none"> <li>The magnitude of sub-lethal effects as they relate to population level changes in productivity under Alternative 2 is unknown. The geographic extent of the research is likely to distribute sub-lethal effects across the range of the population.</li> <li>Disturbance and sub-lethal effects are considered likely given current research techniques, and would affect individual animals intermittently or infrequently.</li> <li>Disturbance from research activities is therefore considered to be minor in duration.</li> </ul>	<ul style="list-style-type: none"> <li>The magnitude of sub-lethal effects as they relate to population level changes in productivity under Alternative 3 is unknown. The geographic extent of the research is likely to distribute sub-lethal effects across the range of the population.</li> <li>Disturbance and sub-lethal effects are considered likely to occur given the current research techniques. Individual animals could be affected by different research activities more than four times per year.</li> <li>Disturbance from research activities is therefore considered to be moderate in frequency.</li> </ul>	<ul style="list-style-type: none"> <li>The magnitude of sub-lethal effects as they relate to population level changes in productivity under Alternative 4 is unknown. The geographic extent of the research is likely to distribute sub-lethal effects across the range of the population.</li> <li>Disturbance and sub-lethal effects are considered likely to occur given the current research techniques. Individual animals could be affected by different research activities more than four or five times per year.</li> <li>Disturbance from research activities is therefore considered to be moderate in frequency.</li> </ul>
	Contribution to Conservation Objectives	<ul style="list-style-type: none"> <li>Would address few conservation objectives. The level of scientific uncertainty regarding the efficacy of critical habitat and fishery regulations would likely increase over time as the original data becomes outdated.</li> <li>Efforts to modify the regulations to either improve conservation of the species or ease the regulatory burden on the fishing industry would rely more on data from other scientific disciplines and research on other marine species in the ecosystem.</li> </ul>	<ul style="list-style-type: none"> <li>The non-intrusive research activities that could be authorized under Alternative 2 could contribute to many but not all of the Draft Recovery Plan objectives. The ability to track population trends for pups and non-pups would be consistent with past efforts.</li> <li>The level of scientific uncertainty regarding the efficacy of critical habitat and fishery regulations would likely increase over time as the original data becomes outdated. Efforts to modify the regulations to either improve conservation of the species or ease the regulatory burden on the fishing industry would therefore have to rely more on data from other scientific disciplines and research on other marine species in the ecosystem.</li> </ul>	<ul style="list-style-type: none"> <li>Research conducted under Alternative 3 could provide information to support all of the conservation objectives listed in the Recovery Plan, at least for some sex/age classes, and the effect is therefore considered to be major in magnitude.</li> <li>Research conducted under Alternative 3 would likely address conservation issues across the range of the population and address both long-term and immediate information needs.</li> </ul>	<ul style="list-style-type: none"> <li>Research conducted under Alternative 4 could provide information to support all of the conservation objectives listed in the Recovery Plan and the effect is therefore considered to be major in magnitude.</li> <li>Research conducted under Alternative 4 would likely address conservation issues across the range of the population and address both long-term and immediate information needs.</li> </ul>
Cumulative	<ul style="list-style-type: none"> <li>The anthropogenic take is presently 218 animals per year or 94% of PBR (231 animals). Under the criteria developed to assess the impacts of the alternatives, this is considered "major". With no new field work, Alternative 1 would contribute no additional mortalities to cumulative anthropogenic mortalities, would contribute no additional sub-lethal cumulative effects, and its contribution to the cumulative conservation efforts would be minimal.</li> </ul>	<ul style="list-style-type: none"> <li>This alternative would contribute an estimated 4.1 mortalities per year, raising the total to about 222 animals (96% of PBR), a cumulative level of mortalities considered "major".</li> <li>Since the population-level effect of disturbance and handling procedures from this alternative is unknown, the contribution to the cumulative sub-lethal effects is also unknown. Compared to Alternative 1, this alternative would increase the amount of contributed research to the scientific basis for management decisions in support of conservation objectives.</li> </ul>	<ul style="list-style-type: none"> <li>This alternative would contribute an estimated 16.5 mortalities per year, raising the overall total to about 235 animals, (102% of PBR) - a cumulative level of mortalities considered "major".</li> <li>Since the population-level effect of disturbance and handling procedures from this alternative is unknown, the contribution to the cumulative sub-lethal effects is also unknown. Compared to Alternatives 1 and 2, this alternative would increase the amount of contributed research to the scientific basis for management decisions in support of conservation objectives.</li> </ul>	<ul style="list-style-type: none"> <li>This alternative would contribute an estimated 34.6 mortalities per year, raising the overall total to about 253 animals, which is 110% of PBR, a cumulative level of mortalities considered "major".</li> <li>Since the population-level effect of disturbance and handling procedures from this alternative is unknown, the contribution to the cumulative sub-lethal effects is also unknown. Compared to Alternatives 1, 2, and 3, this alternative would increase the amount of contributed research to the scientific basis for management decisions in support of conservation objectives.</li> </ul>	





**Table ES-4  
Summary of Direct/Indirect and Cumulative Effects - SSL - eastern DPS - Section 4.8.1.6**

Effect		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 (Preferred Alternative) Research Program with Full Implementation of Conservation Goals
Direct/Indirect	Mortality	<ul style="list-style-type: none"> <li>There would be no research activities that affect this population of SSLs in the wild under this alternative so there would be no mechanism for research-related injury or mortality.</li> </ul>	<ul style="list-style-type: none"> <li>Estimated mortality from research activities under Alternative 2 is 9.7 SSLs per year or 0.49% of PBR. The magnitude/intensity of the effects from mortality is considered minor on the population level.</li> <li>The research would be conducted across the geographic range of the population and the effects of mortality would be distributed across the population.</li> <li>Disturbance effects are considered likely given current research techniques but they would only affect individual animals intermittently or infrequently and are therefore considered to be minor in duration.</li> </ul>	<ul style="list-style-type: none"> <li>Estimated mortality from research activities under Alternative 3 is 51.9 SSLs per year which is 2.64% of PBR. The magnitude/intensity of the effects from mortality is considered negligible on the population level.</li> <li>Research would be conducted across the geographic range of the population and the effects would be distributed across the population.</li> <li>Disturbance effects that lead to mortality are likely to occur given the current knowledge of research techniques used. Although exposure may be brief, individual animals could be affected by different research activities more than four times per year.</li> <li>Disturbance effects are therefore considered to be moderate in frequency.</li> </ul>	<ul style="list-style-type: none"> <li>Because it is assumed that no additional takes or procedures would be warranted under Alternative 4 for this population, the assessment of mortality effects of Alternative 4 is the same as described for Alternative 3.</li> </ul>
	Sub-lethal Effects	<ul style="list-style-type: none"> <li>There would be no mechanism for research-related injury under this alternative and therefore no sub-lethal effects on SSLs.</li> </ul>	<ul style="list-style-type: none"> <li>The magnitude of sub-lethal effects as they relate to population level changes in productivity under Alternative 2 is unknown.</li> <li>The geographic extent of the research under Alternative 2 is likely to distribute sub-lethal effects across the range of the population.</li> <li>Disturbance effects are considered likely given current research techniques but they would only affect individual animals intermittently or infrequently and are therefore considered to be minor in duration.</li> </ul>	<ul style="list-style-type: none"> <li>The magnitude of sub-lethal effects as they relate to population level changes in productivity under Alternative 3 is unknown. The geographic extent of the research is likely to distribute sub-lethal effects across the range of the population.</li> <li>Disturbance effects are considered likely given current research techniques, affecting individual animals could be affected by different research activities more than four times per year and are therefore considered to be moderate in duration.</li> </ul>	<ul style="list-style-type: none"> <li>It is assumed that no additional takes or procedures would be warranted under Alternative 4 for this population, relative to the status quo. The assessment of Alternative 4 on the eastern DPS of SSL sub-lethal effects is the same as described for Alternative 3.</li> </ul>
	Contribution to Conservation Objectives	<ul style="list-style-type: none"> <li>There could be a substantial number of new analyses and syntheses conducted from existing data addressing conservation objectives from the recovery plan. However, the usefulness of existing data would likely decrease over time as environmental conditions and the status of the population changed.</li> </ul>	<ul style="list-style-type: none"> <li>The scope and type of research activities described under Alternative 2 would be sufficient to address most of the conservation objectives in the Draft Recovery Plan except perhaps for the genetics component.</li> </ul>	<ul style="list-style-type: none"> <li>All the recovery objectives in the Draft Recovery Plan could be addressed sufficiently with the scope of research described under this alternative. There would likely be modifications to research objectives or locations over time to address conservation issues as they arise but the overall numbers of takes and types of research techniques described under Alternative 3 should be sufficient to accomplish future conservation objectives for this population.</li> </ul>	<ul style="list-style-type: none"> <li>It is assumed that no additional takes or procedures would be warranted under Alternative 4 for this population, relative to the status quo. The assessment of Alternative 4 on the eastern DPS of SSL for the contribution to conservation objectives is the same as described for Alternative 3.</li> </ul>
Cumulative	<ul style="list-style-type: none"> <li>The anthropogenic take at present is 8 animals per year, or 0.4% of PBR for this population (1,967 animals), considered "negligible" under the criteria developed to assess impacts. Alternative 1 would contribute no additional mortalities to this total and would therefore have no cumulative effect.</li> <li>With no new field work there would be no disturbance and would therefore produce no cumulative effect on sub-lethal effects.</li> <li>Its contribution to the cumulative conservation objectives would be minimal.</li> </ul>	<ul style="list-style-type: none"> <li>Alternative 2 would contribute an estimated 9.7 mortalities per year, raising the overall total to about 18 animals, which is 0.9% of PBR, considered "negligible" under the criteria developed to assess impacts.</li> <li>Alternative 2 would contribute a relatively small amount of disturbance compared to Alternatives 3 and 4. Because the population-level effects of disturbance and handling procedures from alternatives 2 are unknown, the contribution to the cumulative sub-lethal effects is also unknown.</li> <li>Alternative 2 would contribute to all conservation objectives except perhaps serological monitoring of disease and genetic refinement of the population structure.</li> </ul>	<ul style="list-style-type: none"> <li>Alternative 3 would contribute an estimated 51.9 mortalities per year, raising the overall total to about 60 animals, which is 3.1% of PBR, considered "negligible" under the criteria developed to assess impacts.</li> <li>Alternative 3 would contribute an increased level of disturbance compared to Alternatives 1 and 2, but because the population-level effect of disturbance and handling procedures from this alternative is unknown, their contribution to the cumulative sub-lethal effects is also unknown.</li> <li>However, Alternative 3 would be sufficient to address all conservation objectives.</li> </ul>	<ul style="list-style-type: none"> <li>Alternative 4 would contribute an estimated 51.9 mortalities per year (the same as Alternative 3), raising the overall total to about 60 animals, which is 3.1% of PBR, considered "negligible" under the criteria developed to assess impacts.</li> <li>Because it is assumed that no additional takes or procedures would be warranted under Alternative 4, relative to the status quo, for this population, the cumulative effects of this alternative on both sub-lethal effects and conservation objectives are the same as Alternative 3.</li> </ul>	



**Table ES-5  
Summary of Direct/Indirect and Cumulative Effects - NFS - Eastern Pacific stock - Section 4.8.2.1**

Effect		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 (Preferred Alternative) Research Program with Full Implementation of Conservation Goals
Direct/Indirect	Mortality	<ul style="list-style-type: none"> <li>There would be no research activities that affect this population of NFSs in the wild under this alternative so there would be no mechanism for research-related injury or mortality.</li> </ul>	<ul style="list-style-type: none"> <li>Estimated mortality from research activities under Alternative 2 is 1.2 animals per year or much less than 0.1% of PBR. The magnitude/intensity of the effects is considered "negligible" on the population level.</li> </ul>	<ul style="list-style-type: none"> <li>Estimated mortality for research activities under Alternative 3 is 49.3 animals per year or 0.3 % of PBR. The magnitude/intensity of the effects is considered negligible.</li> </ul>	<ul style="list-style-type: none"> <li>Estimated mortality for research activities under Alternative 4 is 65.8 animals per year or 0.5 % of PBR. The magnitude/intensity of the effects is considered negligible.</li> </ul>
	Sub-lethal Effects	<ul style="list-style-type: none"> <li>There would be no mechanism for research-related injury under this alternative and therefore no sub-lethal effects on NFSs.</li> </ul>	<ul style="list-style-type: none"> <li>The duration of research activities under this alternative affecting the animals would be short-term and the degree to which this portion of the research program would contribute to sub-lethal effect would be negligible.</li> </ul>	<ul style="list-style-type: none"> <li>The geographic extent of research activities would be distributed among several rookeries, but within the major breeding area of this stock, and considered moderate.</li> <li>The magnitude of sub-lethal effects under Alternative 3 is unknown. However, based on the numbers of animals potentially affected and the likelihood of occurrence, the magnitude could be minor to moderate.</li> <li>Frequency of research activities and exposure to this level of disturbance could occur several times during the breeding season, and would therefore be considered moderate.</li> </ul>	<ul style="list-style-type: none"> <li>The magnitude of the sub-lethal effects on reproduction at the population level is unknown, but they would be proportionally higher than status quo. Frequency of research activities and exposure to this level of disturbance could occur several times during the breeding season, and is, therefore, considered moderate.</li> </ul>
	Contribution to Conservation Objectives	<ul style="list-style-type: none"> <li>Because of the limited magnitude or intensity of the research program under Alternative 1, the beneficial contribution towards the conservation objectives in the 2006 Draft Conservation Plan is primarily analysis of information already collected and cursory field observations and therefore is considered minor.</li> </ul>	<ul style="list-style-type: none"> <li>Because the magnitude/intensity of the research program under Alternative 2 does allow for some low-level field research activities and non-field related research, the beneficial contribution towards the conservation objectives in the 2006 Draft Conservation Plan is considered minor.</li> </ul>	<ul style="list-style-type: none"> <li>The Alternative 3, Status Quo, research program addresses most priority issues and long-term information needs for the eastern Pacific NFS stock. Based on the magnitude/intensity, long-term nature, and frequency of sampling under the Alternative 3 research program, the beneficial contribution towards the conservation objectives in the 2006 Draft Conservation Plan is considered moderate.</li> </ul>	<ul style="list-style-type: none"> <li>The Alternative 4 research program is focused toward full implementation of the Draft Conservation Plan. Because of the magnitude/intensity, duration, long-term nature, and frequency of sampling under this alternative research program, the beneficial contribution towards the conservation objectives in the 2006 Draft Conservation Plan is considered major. However, the actual contribution would be highly dependant on funding.</li> </ul>
Cumulative		<ul style="list-style-type: none"> <li>The cumulative effect of human-caused mortality from internal and external factors is considered negligible based on the large size of the NFS populations (688,028) and existing levels of human-caused mortality (below the PBR of 14,546). The contribution of the research programs under all of the alternatives to the cumulative effect of mortality are considered negligible.</li> <li>Alternative 1 would contribute to no disturbance and, therefore, there would be no cumulative effect on sub-lethal effects.</li> <li>Alternative 1 would contribute no new field work; its contribution to the cumulative conservation efforts would therefore be very minimal.</li> </ul>	<ul style="list-style-type: none"> <li>The contribution of the research programs under Alternative 2 to the cumulative effect of mortality are considered negligible.</li> <li>Alternative 2 would contribute a relatively small amount of disturbance compared to Alternatives 3 and 4. Because the population-level effect of disturbance and handling procedures from this alternative is unknown, their contribution to the cumulative sub-lethal effects is also unknown.</li> <li>Compared to Alternative 1, this alternative would increase the amount of contributed research to the scientific basis for management decisions in support of conservation objectives.</li> </ul>	<ul style="list-style-type: none"> <li>The contribution of the research programs under Alternative 3 to the cumulative effect of mortality are considered negligible.</li> <li>Alternative 3 would contribute an increased level of disturbance compared to Alternatives 1 and 2, but because the population-level effect of disturbance and handling procedures from this alternative is unknown, their contribution to the cumulative sub-lethal effects is also unknown.</li> <li>Compared to Alternative 1 and 2, this alternative would increase the amount of contributed research to the scientific basis for management decisions in support of conservation objectives.</li> </ul>	<ul style="list-style-type: none"> <li>The contribution of the research programs under Alternative 4 to the cumulative effect of mortality are considered negligible.</li> <li>Alternative 4 would contribute an increased level of disturbance compared to Alternatives 1, 2, and 3, but because the population-level effect of disturbance and handling procedures from this alternative is unknown, their contribution to the cumulative sub-lethal effects is also unknown.</li> <li>Compared to Alternative 1, 2 and 3, this alternative would increase the amount of contributed research to the scientific basis for management decisions in support of conservation objectives.</li> </ul>



**Table ES-6  
Summary of Direct/Indirect and Cumulative Effects - NFS - San Miguel Island stock - Section 4.8.2.6**

Effect		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 (Preferred Alternative) Research Program with Full Implementation of Conservation Goals
Direct/Indirect	Mortality	<ul style="list-style-type: none"> <li>There would be no research activities that affect NFSs in the wild under this alternative so there would be no mechanism for research-related injury or mortality.</li> </ul>	<ul style="list-style-type: none"> <li>Total take would be approximately 3,750 (approximately half of which would be pups), but the predicted mortality from research under this alternative is also expected to be zero</li> </ul>	<ul style="list-style-type: none"> <li>The estimated number of takes and mortality assessments for research activities under Alternative 3 are approximately 5.1 animals per year, or less than 3% of PBR. The magnitude/intensity of the effects from mortality is considered "negligible" on the population level.</li> </ul>	<ul style="list-style-type: none"> <li>The estimated number of takes and mortality assessments for research activities under Alternative 4 are the same as Alternative 3. The magnitude/intensity of the effects from mortality is considered "negligible" on the population level.</li> <li>The methods and procedures authorized under this research program would include all of those discussed under Alternative 3 and additional methods as deemed appropriate.</li> </ul>
	Sub-lethal Effects:	<ul style="list-style-type: none"> <li>There would be no mechanism for research-related injury under Alternative 1 and, therefore, there would be no sub-lethal effects on the San Miguel Island stock of the NFS.</li> </ul>	<ul style="list-style-type: none"> <li>The sub-lethal effects of the low level of research activities allowed under Alternative 2 are expected to have a negligible effect on reproductive success. The geographic extent would be considered major in that it would potentially affect much of the breeding population on San Miguel Island. However, the magnitude and intensity of the direct and indirect effects would be considered negligible because of the types of activities that would be allowed under Alternative 2.</li> </ul>	<ul style="list-style-type: none"> <li>Effects of research activities on reproductive success would be considered minor. Although there are mechanisms for sub-lethal effects to occur, the result of these effects on reproductive success would be similar to the status quo. The geographic extent would be major in that it is concentrated at one site: San Miguel Island, the only breeding area for this stock.</li> </ul>	<ul style="list-style-type: none"> <li>Under Alternative 4, the research program would be essentially the same as under Alternative 4; therefore, direct and indirect sub-lethal effects are expected to be similar to those discussed under Alternative 3. Additional methods and procedures could be authorized as appropriate but protocols are not known at this time.</li> </ul>
	Contribution to Conservation Objectives	<ul style="list-style-type: none"> <li>Because the San Miguel Island stock of NFSs is not listed as threatened or endangered under the ESA or listed as depleted under the MMPA, there are currently no recovery objectives.</li> </ul>	<ul style="list-style-type: none"> <li>Because the San Miguel Island stock of NFSs is not listed as threatened or endangered under the ESA or listed as depleted under the MMPA, there are currently no recovery objectives.</li> </ul>	<ul style="list-style-type: none"> <li>Because the San Miguel Island stock of NFSs is not listed as threatened or endangered under the ESA or listed as depleted under the MMPA, there are currently no recovery objectives.</li> </ul>	<ul style="list-style-type: none"> <li>Because the San Miguel Island stock of NFSs is not listed as threatened or endangered under the ESA or listed as depleted under the MMPA, there are currently no recovery objectives.</li> </ul>
Cumulative	<ul style="list-style-type: none"> <li>Because there are no direct or indirect effects associated with Alternative 1, there would be no cumulative effect on mortality.</li> <li>Alternative 1 would not contribute to disturbance and therefore there would be no cumulative effect on sub-lethal effects</li> </ul>	<ul style="list-style-type: none"> <li>The contribution of the research programs under Alternative 2 to the cumulative effect of mortality are considered negligible.</li> <li>Alternative 2 would contribute a relatively small amount of disturbance compared to Alternatives 3 and 4. Because the population-level effect of disturbance and handling procedures from this alternative is unknown, their contribution to the cumulative sub-lethal effects is also unknown.</li> <li>Compared to Alternative 1, this alternative would increase the amount of contributed research to the scientific basis for management decisions in support of conservation objectives.</li> </ul>	<ul style="list-style-type: none"> <li>The contribution of the research programs under Alternative 3 to the cumulative effect of mortality are considered negligible.</li> <li>Alternative 3 would contribute an increased level of disturbance compared to Alternatives 1 and 2, but because the population-level effect of disturbance and handling procedures from this alternative is unknown, their contribution to the cumulative sub-lethal effects is also unknown.</li> <li>Compared to Alternatives 1 and 2, this alternative would increase the amount of contributed research to the scientific basis for management decisions in support of conservation objectives.</li> </ul>	<ul style="list-style-type: none"> <li>The contribution of the research programs under Alternative 4 to the cumulative effect of mortality are considered negligible.</li> <li>Alternative 4 would contribute an increased level of disturbance compared to Alternatives 1, 2 and 3, but because the population-level effect of disturbance and handling procedures from this alternative is unknown, their contribution to the cumulative sub-lethal effects is also unknown.</li> <li>Compared to Alternative 1, 2 and 3, this alternative would increase the amount of contributed research to the scientific basis for management decisions in support of conservation objectives.</li> </ul>	



**Table ES-7  
Summary of Direct/Indirect and Cumulative Effects - Killer Whales - Section 4.8.3**

Effect		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 (Preferred Alternative) Research Program with Full Implementation of Conservation Goals
Direct/Indirect	Reduced survival or reproductive success due to SSL and NFS research	<ul style="list-style-type: none"> <li>There would be no research-related take or disturbance of SSLs and NFSs under Alternative 1. However, research on the role of killer whale in SSL and NFS population dynamics that does not require authorization for incidental take or disturbance of SSLs and NFSs would occur. Potential injury or death to killer whales could occur as a result of strikes (rare) by marine research vessels as well as discharges and increased turbidity (short-term).</li> <li>Therefore, the effects of Alternative 1 on the survival and reproductive success of killer whales are considered negligible.</li> </ul>	<ul style="list-style-type: none"> <li>The magnitude and frequency of research would likely increase under Alternative 2 because incidental take or disturbance of SSL and NFS would be permitted. Encounters with marine vessels resulting in injury or death to killer whales would be rare and are considered unlikely to cause a measurable reduction in survival or reproductive success of the population.</li> <li>Activities associated with research on SSLs and NFSs could cause a small, temporary increase in the numbers of these animals in the water around rookeries and haulouts and available as prey for killer whales. Because killer whales forage over vast areas and prey on many species other than SSLs and NFS, the overall foraging success of killer whales is not likely to be affected.</li> <li>Therefore, the overall effects on the survival and reproductive success of killer whales under Alternative 2 are considered negligible.</li> </ul>	<ul style="list-style-type: none"> <li>Research on the role of killer whales in the population dynamics of SSLs and NFSs would increase under the status quo, including incidental take. There is also a potential for increase in the number and frequency of permitted vessel surveys of SSLs and NFSs. As described for Alternative 1 and 2, encounters with marine vessels resulting in injury or death to killer whales would be rare and are considered unlikely to cause a measurable reduction in survival or reproductive success of the population.</li> <li>Under the status quo, the effects of disturbance and injury on SSLs and NFSs would increase over current levels. However, this incremental change is unlikely to affect the foraging success of killer whales and would therefore have negligible effects on their chance of survival or their reproductive success.</li> <li>Therefore, the overall effects of Alternative 3 on the survival and reproductive success of killer whales are considered negligible.</li> </ul>	<ul style="list-style-type: none"> <li>Under Alternative 4, the effects of vessel strikes on the survival and reproductive success of killer whales would be similar in nature to those described under Alternative 3.</li> <li>The effects of disturbance and injury on SSLs and NFSs would increase over current levels. However, this incremental change is unlikely to affect the foraging success of killer whales and would therefore have negligible effects on their chance of survival or their reproductive success.</li> </ul>
	Disturbance due to SSL and NFS research	<ul style="list-style-type: none"> <li>Disturbance through visual cues and noise pollution could be caused by marine research vessels in close approach to animals. The geographic effects would be in the immediate vicinity of the vessel. Effects would include avoidance behavior and displacement, interference with whale communication, and echolocation.</li> <li>Given that few research vessels would approach killer whales under this alternative and would do so for only short periods of time, the effects of disturbance would be short-term and there would be no measurable effects on the overall population or distribution of killer whales.</li> <li>Therefore, the effects of disturbance on killer whales under Alternative 1 are considered negligible.</li> </ul>	<ul style="list-style-type: none"> <li>As described above and in Alternative 1, the effects of disturbance would be short-term and would produce no measurable effects on the overall population or distribution of killer whales. The overall effects of disturbance on killer whales are considered negligible.</li> </ul>	<ul style="list-style-type: none"> <li>As described under Alternatives 1 and 2, the effects of research on SSLs and NFSs would be short-term and produce no measurable effects on the overall population or distribution of killer whales.</li> <li>Therefore, the effects of disturbance on killer whales under Alternative 3 are considered negligible.</li> </ul>	<ul style="list-style-type: none"> <li>Although the level of research on SSLs and NFSs and research directed at killer whales under Alternative 4 would increase from current levels, the effects of disturbance on killer whales from marine vessels would be similar in nature to those described under Alternative 3.</li> <li>The effects of disturbance on killer whales under Alternative 4 are considered negligible.</li> </ul>
Cumulative		<ul style="list-style-type: none"> <li>A number of factors have been identified that could cause disturbance and/or affect the survival and reproductive success of killer whales, including from commercial fisheries, intentional shooting, vessel traffic, and marine pollution. Effects of global climate change or long-term regime shifts are difficult to predict, with potential beneficial or adverse effects.</li> <li>The direct and indirect effects associated with all alternatives are considered negligible; therefore, the contribution of research activities on SSLs and NFSs to overall cumulative effects on killer whales would be negligible.</li> </ul>	<ul style="list-style-type: none"> <li>The cumulative effects of Alternative 2 would be substantially the same as for Alternative 1.</li> </ul>	<ul style="list-style-type: none"> <li>The cumulative effects of Alternative 3 would be substantially the same as for Alternative 1.</li> </ul>	<ul style="list-style-type: none"> <li>The cumulative effects of Alternative 4 would be substantially the same as for Alternative 1.</li> </ul>





**Table ES-8  
Summary of Direct/Indirect and Cumulative Effects - Other ESA-listed species - Section 4.8.4**

Effect		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 (Preferred Alternative) Research Program with Full Implementation of Conservation Goals
Direct/Indirect	Reduced survival or reproductive success due to SSL and NFS research	<ul style="list-style-type: none"> <li>No apparent mechanisms that could affect the survival or reproductive success of ESA-listed whale or sea otter populations have been identified under this alternative; therefore, the direct and indirect effects of Alternative 1 are considered negligible.</li> </ul>	<ul style="list-style-type: none"> <li>Marine vessels used for conducting research on SSLs and NFSs could cause vessel strikes, particularly during high-speed transit to and from survey locations, resulting in possible injury or mortality to individual animals. Vessel strikes on marine mammals, however, are rare and it is also unlikely that vessels associated with SSL and NFS research would intentionally approach whales or sea otters. It is unlikely that vessel strikes would cause a measurable reduction in the overall survival or reproductive success of any species.</li> <li>Vessel discharges and increased turbidity are generally localized short-term changes in water quality and unlikely to affect the survival and reproductive success of whales and sea otters.</li> </ul>	<ul style="list-style-type: none"> <li>The frequency and geographic extent of marine vessel use for the purposes of researching SSLs and NFSs could increase. Although more research vessels could increase the potential for vessel strikes on whales and sea otters, vessel strikes on marine mammals are uncommon, and it is not likely that research vessels would approach these animals. Therefore, effects of Alternative 3 would be similar to Alternative 2 with regard to survival or reproductive success of whales and sea otters and are considered negligible.</li> </ul>	<ul style="list-style-type: none"> <li>The frequency and magnitude of research activities under Alternative 4 would be greater than current levels, but would be similar in nature with regard to the effects on the survival and reproductive success of ESA-listed whales and sea otters as described for Alternative 3. The effects of Alternative 4 on the survival and reproductive success of ESA-listed whales and sea otters are negligible.</li> </ul>
	Disturbance due to SSL and NFS research	<ul style="list-style-type: none"> <li>No apparent mechanisms of disturbance to ESA-listed whale or sea otter populations have been identified under this alternative; therefore, the direct and indirect effects of Alternative 1 are considered negligible.</li> </ul>	<ul style="list-style-type: none"> <li>Marine vessels used for conducting research on SSLs and NFSs could potentially result in disturbance of ESA-listed whales if any are in the vicinity. Effects include underwater noise pollution interfering with whale communication and echolocation; avoidance and modifications to surfacing, respiration, and diving cycles, all of which can be accompanied by stress. The effects of disturbance on these whales, however, would depend on vessels passing very close to the animals.</li> <li>ESA-listed whales could be disturbed by opportunistic sightings during SSL and NFS low-altitude aerial surveys, causing behavioral changes in a few individuals. This disturbance is considered to be infrequent and cause minimal disturbance. Sea otters concentrated in the vicinity of SSL and NFS haulouts could be potentially disturbed. These events would be short-term and would be unlikely to have any measurable effects on local sea otter populations.</li> <li>Therefore, the effects of disturbance on sea otters under Alternative 3 are considered negligible.</li> </ul>	<ul style="list-style-type: none"> <li>Because little or no marine vessels or aircraft would seek out or occur in the vicinity of whales under this alternative, there would be no measurable effects of disturbance. Therefore, the effects of disturbance on whales under Alternative 3 are considered negligible.</li> <li>Few sea otters are likely to occupy areas where research activities occur, and therefore there would be no measurable effects of disturbance on the population.</li> <li>Therefore, the effects of disturbance on sea otters under Alternative 3 are considered negligible.</li> </ul>	<ul style="list-style-type: none"> <li>The frequency and magnitude of research activities under Alternative 4 would be greater than current levels, but would be similar in nature with regard to the effects of disturbance on ESA-listed whales and sea otters as described for Alternative 3. The effects of disturbance on ESA-listed whales and sea otters under Alternative 4 are considered negligible.</li> </ul>
Cumulative		<ul style="list-style-type: none"> <li>Few internal factors, and a number of external factors, have been identified that could cause disturbance and affect the survival and reproductive success of both ESA-listed whales and sea otters. It is believed that lingering effects from past actions have caused the decline and/or are preventing de-listing of the species.</li> <li>Because there would be no direct or indirect effects associated with Alternative 1, this alternative would not contribute to cumulative effects on great whales or sea otters.</li> </ul>	<ul style="list-style-type: none"> <li>The direct and indirect effects associated with Alternatives 2, 3, and 4 are considered negligible; therefore, the contribution of research activities on SSLs and NFSs to the overall cumulative effect on ESA-listed whales and sea otters is negligible.</li> </ul>	<ul style="list-style-type: none"> <li>The cumulative effects of Alternative 3 would be substantially the same as for Alternative 2.</li> </ul>	<ul style="list-style-type: none"> <li>The cumulative effects of Alternative 3 would be substantially the same as for Alternative 2.</li> </ul>



**Table ES-9  
Summary of Direct/Indirect and Cumulative Effects - Other marine mammals (Cetaceans, Pinnipeds) - Section 4.8.5**

Effect		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 (Preferred Alternative) Research Program with Full Implementation of Conservation Goals
Direct/Indirect	Reduced survival or reproductive success due to SSL and NFS research	<ul style="list-style-type: none"> <li>Under all of the alternatives, no apparent mechanisms have been identified for affecting the marine mammal species other than the California sea lion.</li> <li>Direct and indirect effects of research on California sea lions as a surrogate species for SSLs would be associated with short-term disturbance of other animals during capture activities, injuries to animals incurred during capture, potential morality or injury to pups from stampede, and increased risk of predation by killer whales but these are unlikely to result in a measurable effect on the survival and reproductive success of California sea lions.</li> </ul>	<ul style="list-style-type: none"> <li>The effects on the survival and reproductive success of California sea lions associated with activities under Alternative 2 would be similar to Alternative 1 and are considered negligible.</li> </ul>	<ul style="list-style-type: none"> <li>The effects on the survival and reproductive success of California sea lions associated with activities under Alternative 3 would be similar to Alternative 1 and 2 and are considered negligible.</li> </ul>	<ul style="list-style-type: none"> <li>The frequency and magnitude of research activities under Alternative 4 would be greater than current levels, but would be similar in nature with regard to the effects on the survival and reproductive success of California sea lions as Alternative 3. The effects of Alternative 4 on the survival and reproductive success of California sea lions are considered negligible.</li> </ul>
	Disturbance due to SSL and NFS research	<ul style="list-style-type: none"> <li>Capture of California sea lions in the wild could result in short-term disturbance of other animals during research activities. Given that few California sea lions would be captured and used in captive experiments, disturbance from capture and release would be periodic and the geographic extent of the effects would be limited to the immediate vicinity of the activity. This activity would have no measurable effect on the abundance or distribution of the California sea lion, and therefore is considered negligible</li> </ul>	<ul style="list-style-type: none"> <li>Given that California sea lions are abundant and widely distributed, the effects of disturbance on California sea lions under Alternative 2 are considered negligible.</li> </ul>	<ul style="list-style-type: none"> <li>The effects of disturbance and reduced survival and reproductive success of California sea lions under Alternative 3 would be similar to Alternative 2 and are considered negligible.</li> </ul>	<ul style="list-style-type: none"> <li>The frequency and magnitude of research activities under Alternative 4 would be greater than current levels, but would be similar in nature as Alternative 3. The effects of disturbance of California sea lions under Alternative 4 would be similar to Alternative 2 and 3 and are considered negligible.</li> </ul>
Cumulative		<ul style="list-style-type: none"> <li>The current population of California sea lions, estimated at around 240,000 animals (minimum population estimate of 138,881 animals), does not appear to be affected by past or present actions, including the disturbance of hundreds to thousands of California sea lions incidental to research on the species.</li> <li>The number of California sea lions removed from the wild for research as a surrogate to SSLs would not approach the species' PBR of 8,333 sea lions per year.</li> <li>Therefore, the contribution of SSL and NFS research activities under all Alternatives to the overall cumulative effect on California sea lions would be negligible.</li> </ul>	<ul style="list-style-type: none"> <li>The cumulative effects of Alternative 2 would be substantially the same as for Alternative 1.</li> </ul>	<ul style="list-style-type: none"> <li>The cumulative effects of Alternative 3 would be substantially the same as for Alternative 1.</li> </ul>	<ul style="list-style-type: none"> <li>The cumulative effects of Alternative 4 would be substantially the same as for Alternative 1.</li> </ul>



**Table ES-10**  
**Summary of Direct/Indirect and Cumulative Effects – Seabirds - Section 4.8.6**

Effect		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 (Preferred Alternative) Research Program with Full Implementation of Conservation Goals
Direct/Indirect	Reduced survival or reproductive success due to SSL and NFS research	<ul style="list-style-type: none"> <li>Under Alternative 1, direct and indirect effect of the limited research program would most likely be from individual observers gaining access to high ground above the SSL and NFS rookeries for behavioral observation or installation/maintenance of remote sensing equipment. This response would not be expected to reduce survival of nestlings or adult seabirds of any species. These effects would not be expected to result in mortality of the eggs or chicks and would not affect reproductive success.</li> </ul>	<ul style="list-style-type: none"> <li>Aerial survey for SSL and NFS would be conducted at an elevation that is not anticipated to adversely affect any nesting seabird species or ESA-listed bird species. Mortality of adults or chicks from disturbance from overflights is unlikely based the elevation of the aircraft. Magnitude and geographic extent of any disturbance effects from research activities on ESA-listed species is negligible. Overall, effect of research activities on survival or reproductive success is considered negligible.</li> </ul>	<ul style="list-style-type: none"> <li>Land-based census activities and intensive sampling would potentially increase general disturbance to nesting seabirds in adjacent areas. The degree of disturbance would depend on many site factors, such as the distance from researcher to nesting seabirds, species affected, time of season, and level of disturbance for the activity. The likelihood of adverse effects to reproductive success from land-based activities would be very low. Effects of disturbance from research activity on seabird survival or productivity would be negligible.</li> <li>Effects on ESA-listed species are unlikely and are considered negligible.</li> </ul>	<ul style="list-style-type: none"> <li>Aerial survey and land-based census activities and intensive sampling would potentially increase general disturbance to nesting seabirds in adjacent areas under Alternative 4. The degrees of disturbance would depend on many site factors, such as the distance from researcher to nesting seabirds, species affected, time of season, and level of disturbance for the activity. The likelihood of adverse effects to reproductive success from aerial surveys or land-based activities would be very low. Effects of disturbance from research activity on seabird's survival or productivity would be negligible.</li> <li>Effects on ESA-listed species are unlikely and considered negligible.</li> </ul>
	Disturbance due to SSL and NFS research	<ul style="list-style-type: none"> <li>Alternative 1 would result in very little or no disturbance to nesting seabirds. Some potential disturbance would be associated with remote observations of SSL or NFS, depending on the routes taken to their observation sites or blinds. Avoidance of areas with nesting seabirds by researchers would greatly minimize effects of this disturbance. Installation and maintenance of remote camera equipment could also cause some disturbance to nesting seabirds if they occur in the area, especially if the use of helicopters is required. Overall, effects of disturbance are considered negligible.</li> </ul>	<ul style="list-style-type: none"> <li>Direct and indirect effects of the scope of research under Alternative 2 on seabirds would be primarily associated with short-term disturbance from aerial survey overflights and land-based observations. There is a potential for some small loss of eggs or chicks from panic flights but this is highly dependent on factors such as timing of the surveys, elevation of the aircraft, locations of the seabird colonies in reference to the rookeries and haul-outs, past habituation to human disturbance (ground, vessel, or aircraft), and proximity of researcher to colonies. Effects of any disturbance on reproductive success of seabirds would be negligible.</li> <li>Effects on ESA-listed species are unlikely and considered negligible.</li> </ul>	<ul style="list-style-type: none"> <li>Direct and indirect effects of the scope of research under Alternative 3 on seabirds would be primarily associated with short-term disturbance from aerial survey overflights and land-based activities at rookeries and haulouts. Effects of any disturbance on reproductive success of seabird colonies are unlikely. After the breeding season, disturbance effects from scat collection or other survey activity would be negligible.</li> <li>The effects of the generally low intensity of disturbance during this time of year would be considered negligible.</li> <li>Magnitude and geographic extent of any disturbance effects from research activities on ESA-listed species would be negligible.</li> </ul>	<ul style="list-style-type: none"> <li>Direct and indirect effects of the scope of research under Alternative 4 on seabirds would be primarily associated with short-term disturbance from aerial survey overflights and land-based activities at rookeries and haulouts. Although this would represent an increase in activity at some rookeries and haulout, effects of any disturbance on reproductive success of seabird colonies are unlikely. After the breeding season, disturbance effects from scat collection or other survey activity would be negligible.</li> <li>Magnitude and geographic extent of any disturbance effects from research activities on ESA-listed species would be negligible.</li> </ul>
Cumulative		<ul style="list-style-type: none"> <li>The seabird groups in this analysis represent a wide diversity of niches and all have experienced infrequent mortality events in the recent past. All are also susceptible to future human-caused mortality factors.</li> <li>Contribution from activities associated with SSL and NFS research, however, is considered negligible. Because the direct and indirect effects associated with Alternative 1 approach zero, they would not contribute to the overall cumulative effects on any species.</li> <li>Overall, the contribution to an overall cumulative effect from any of the alternatives is considered negligible.</li> </ul>	<ul style="list-style-type: none"> <li>Alternatives 2, 3, and 4 would involve additional disturbance to a large geographic area from aerial surveys. The magnitude/intensity and duration of these effects are considered negligible.</li> <li>Overall, the contribution to a cumulative effect from any of the alternatives is considered negligible.</li> </ul>	<ul style="list-style-type: none"> <li>The cumulative effects of Alternative 3 would be substantially the same as for Alternative 2.</li> </ul>	<ul style="list-style-type: none"> <li>The cumulative effects of Alternative 4 would be substantially the same as for Alternative 2.</li> </ul>



**Table ES-11  
Summary of Direct/Indirect and Cumulative Effects - Economic Effects of Federal Funding for SSL and NFS Research - Section 4.10**

Effect		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 (Preferred Alternative) Research Program with Full Implementation of Conservation Goals
Direct/Indirect	Assessment of the Economic Effects of Changes in Research Expenditures	<ul style="list-style-type: none"> <li>The restrictions on research under Alternative 1 would likely result in less funding for SSL and NFS research relative to the other alternatives. The lower funding level would have an immediate and major negative economic effect on entities that have been recipients of those funds. There would also be a broader negative effect on the local economy because of the spending/income multiplier effect, but this effect would be minimal due to the relatively minor role SSL and NFS research funding plays in generating economic activity in regions within the project area.</li> </ul>	<ul style="list-style-type: none"> <li>Alternative 2 is similar to Alternative 1 in that no grants, permits or authorizations would be issued for research activities that require capture, handling, and/or invasive procedures on wild animals. The inability of researchers to engage in these research activities could have negative implications for research funding. However, researchers may choose to seek funding to expand their efforts with non-intrusive techniques. In that event, the effect of Alternative 2 on the level of funding for SSL and NFS research would be less negative than under Alternative 1.</li> </ul>	<ul style="list-style-type: none"> <li>The policy direction of this alternative would have no effect on research funding because grants and permits would be issued for the same type and scope of research as occurred under SSL grants and permits prior to the 26 May 2006 court order.</li> </ul>	<ul style="list-style-type: none"> <li>A research program with full implementation of conservation goals would require a much larger research budget than is currently allocated to these species.</li> <li>It is uncertain whether a proposal for an extensive program would in fact lead to higher funding levels because neither the SSL Recovery Plan nor the NFS Conservation Plan commits or requires funding of their respective objectives.</li> <li>Alternative 4 may help remove some of the budgetary and other constraints affecting the parties involved by making SSL and NFS research more attractive to both researchers and sources of research funding.</li> </ul>
	Assessment of the Economic Effects of Changes in Research Output	<ul style="list-style-type: none"> <li>The usefulness of existing data in terms of addressing the conservation objectives from the SSL Recovery Plan would likely decrease over time as environmental conditions and the status of the population changes.</li> <li>The beneficial contribution of research under Alternative 1 towards the objectives in the NFS Conservation Plan is considered negligible.</li> <li>Alternative 1 would lead to a potential substantial loss of welfare among that segment of the American public who value SSL and NFS protection, depending on the ultimate biological consequences of the lack of research.</li> <li>The loss of human welfare resulting from the deaths of individual animals due to research would be the lowest under Alternative 1 relative to the other alternatives.</li> <li>It is uncertain if this benefit would outweigh the loss of welfare should Alternative 1 contribute to a failure to stop or reverse a decline of SSL or NFS populations.</li> </ul>	<ul style="list-style-type: none"> <li>The non-intrusive research activities that could be authorized under Alternative 2 could contribute to some of the SSL Recovery Plan objectives.</li> <li>The beneficial contribution towards the conservation objectives in the NFS Conservation Plan is considered minor.</li> <li>Alternative 2 would lead to a gain in welfare among that segment of the American public who value the protection of SSL and NFS.</li> <li>The likelihood of a loss of human welfare resulting from the deaths of individual animals due to research would be lower under Alternative 2 relative to the status quo.</li> <li>It is uncertain if this benefit would outweigh the loss of welfare should Alternative 2 contribute to a failure to stop or reverse a decline of SSL or NFS populations.</li> </ul>	<ul style="list-style-type: none"> <li>Given the contribution of research results developed under Alternative 3 to the recovery and conservation of SSL and NFS, the likelihood that individuals who value the protection of these species would incur a welfare loss is less than would be the case under Alternatives 1 and 2.</li> <li>The likelihood of a loss of human welfare resulting from the deaths of individual animals due to research would be higher under Alternative 3 than under Alternative 1 or Alternative 2.</li> <li>It is uncertain if this loss would outweigh the gain in welfare should Alternative 3 contribute to the protection of SSL or NFS populations.</li> </ul>	<ul style="list-style-type: none"> <li>Given the beneficial contribution towards the recovery and conservation of SSL and NFS, the likelihood that individuals who value the protection of these species would experience a welfare gain is similar to that of Alternative 3 and higher than would be the case under Alternatives 1 and 2.</li> <li>The estimated direct and indirect mortality of SSL and NFS from research would be higher under Alternative 4 than under any other alternative due to the increased scope of the research program. Consequently, the likelihood of a loss of human welfare resulting from the deaths of individual animals due to research would be highest under Alternative 4.</li> <li>It is uncertain if this loss would outweigh the gain in welfare should Alternative 4 contribute to the protection of SSL or NFS populations.</li> </ul>
Cumulative		<ul style="list-style-type: none"> <li>On-going federal budget constraints and reduction in research funding is likely under Alternative 1, having an additive cumulative effect on SSL and NFS research funding.</li> <li>The ability to secure research funding from non-federal sources would be hampered, with a rapid and substantial decline in research funding that would have negative employment and income generation effects both on the entities that have been the recipients of these funds and on the broader local economy due the multiplier effect.</li> <li>Alternative 1 would have the lowest likelihood of gain in welfare among that segment of the American public who value the protection of SSL and NFS.</li> </ul>	<ul style="list-style-type: none"> <li>The cumulative effects of Alternative 2 would be substantially the same as for Alternative 1, with a slightly greater likelihood of gain in welfare among that segment of the American public who value the protection of SSL and NFS over Alternative 1 but less than Alternatives 2 and 3.</li> </ul>	<ul style="list-style-type: none"> <li>Offsetting reductions in federal funding for SSL and NFS research with funds from other sources would be greater under Alternative 3 and Alternative 4 because of the higher potential to acquire new knowledge that will lead to the identification of key factors for the recovery of SSL and conservation of NFS. Consequently, the potential to generate positive effects on the economy in terms of jobs created and purchases of goods and services is higher under Alternative 3 and Alternative 4 than under Alternative 1 and Alternative 2.</li> </ul>	<ul style="list-style-type: none"> <li>The cumulative effects of Alternative 4 would be substantially the same as for Alternative 3, with the highest likelihood of gain in welfare among that segment of the American public who value the protection of SSL and NFS over the other alternatives.</li> </ul>





**Table ES-12  
Summary of Direct/Indirect and Cumulative Effects - SSL Subsistence Harvesting - Section 4.9.1.1**

<b>Effect</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 (Preferred Alternative) Research Program with Full Implementation of Conservation Goals</b>
Direct/Indirect	<ul style="list-style-type: none"> <li>None of the research methods permitted under Alternative 1 would directly affect the subsistence harvesting of SSLs.</li> <li>Alternative 1 could result in research becoming outdated as environmental conditions and status of SSL population change. Depending on the ultimate biological consequences of the research permitted under Alternative 1, indirect effects associated with its implementation could be minor.</li> </ul>	<ul style="list-style-type: none"> <li>None of the research methods permitted under Alternative 2 would directly affect the subsistence harvesting of SSLs. Depending on the ultimate biological consequences of the research permitted under Alternative 2, however, the indirect effects associated with its implementation could be minor.</li> </ul>	<ul style="list-style-type: none"> <li>While Alternative 3 could theoretically affect subsistence, it is likely that only a few, if any, of the same individual SSLs used for research would be included in the subsistence harvest. Thus, direct effects related to the implementation of Alternative 3 are considered to be negligible. Because the methods under Alternative 3 would address the basic information needs outlined in the Draft Recovery Plan, indirect effects are also considered negligible.</li> </ul>	<ul style="list-style-type: none"> <li>The projected intensity and wide geographic nature of permitted research under Alternative 4 have the possibility to affect the subsistence harvest in a direct and moderate manner, depending on the level of overlap between SSL subsistence populations and those studied by researchers. Because the methods permitted under Alternative 4 would directly address the needs outlined under the Draft Recovery Plan, however, indirect effects are considered negligible.</li> </ul>
Cumulative	<ul style="list-style-type: none"> <li>For subsistence hunters living in small communities, the implementation of Alternative 1 has the potential to create major cumulative effects, including decrease in educational outreach by visiting research staff and a drop in economic interaction with local business owners. Larger communities would be less affected.</li> <li>The cumulative effects of a minor decrease in the number of potential SSL available for subsistence harvest could be minor in small communities heavily reliant on SSL subsistence harvest.</li> </ul>	<ul style="list-style-type: none"> <li>For all communities within the study area, the implementation of Alternative 2 has the potential to create minor cumulative effects. As is similar under Alternative 1, Alternative 2 has the potential to affect the subsistence harvest because its implementation would potentially result in research that would become outdated as factors change over time or that would not be supported by other types of more direct research on SSLs.</li> <li>A minor decrease in the number of potential SSLs available for the subsistence harvest on a general or localized basis could have a minor effect on subsistence depending on the ultimate biological consequences of the lack of research. An increased use of aerial surveys could also disturb the act of the harvest in a minor way. If this minor effect is combined with a decrease in number of SSLs, then it is somewhat likely that the subsistence harvest could be threatened. Alternative 2 is not likely to result in a substantial decrease in educational and economic interactions.</li> </ul>	<ul style="list-style-type: none"> <li>For all communities within the study area, the implementation of Alternative 3 is not considered likely to result in cumulative effects.</li> <li>As Alternative 3 would reinstate the activities permitted before the court order, it is generally assumed that subsistence activities and community interactions would return to levels present before the permits were vacated. As such, there would not likely be a change from the existing conditions.</li> </ul>	<ul style="list-style-type: none"> <li>For smaller communities within the study area, the implementation of Alternative 4 has the potential to create major interactive community effects. This is particularly true for smaller, rural communities and other communities that, under Alternative 4, would experience interactions with research staff for the first time.</li> <li>Subsistence harvesters of SSLs could be affected directly in ways ultimately dependent on the level of overlap between SSL subsistence populations and those studied by researchers. These effects would combine with the increased economic, educational, and sociocultural interactions that are possible under Alternative 4. This is especially true if new economic gains are invested in educational opportunities, or if increased sociocultural interactions can be used to negotiate more sensitive cooperation between subsistence harvesters and researchers. These negotiations would have the possibility of mitigating in whole, or in part, the moderate direct effects on the subsistence harvest.</li> </ul>



**Table ES-13**  
**Summary of Direct/Indirect and Cumulative Effects - NFS Subsistence Harvesting - Section 4.9.1.2**

<b>Effect</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 (Preferred Alternative) Research Program with Full Implementation of Conservation Goals</b>
Direct/Indirect	<ul style="list-style-type: none"> <li>None of the research methods permitted under Alternative 1 would directly or indirectly affect the subsistence harvesting of NFSs. Alternative 1 would have a negligible effect on the subsistence harvest of NFSs.</li> </ul>	<ul style="list-style-type: none"> <li>None of the research methods permitted under Alternative 2 would directly or indirectly affect the subsistence harvest of NFSs. Alternative 2 would have a negligible effect on the subsistence harvest of NFSs.</li> </ul>	<ul style="list-style-type: none"> <li>Although Alternative 3 could theoretically affect subsistence, it is likely that few, if any, of the same individual NFSs used for research would be included in the subsistence harvest. This is especially true if cooperative co-management agreements continue into the future. Thus, direct effects and indirect effects related to the implementation of Alternative 3 are considered negligible. Alternative 3 would have a negligible effect on the subsistence harvest of NFSs.</li> </ul>	<ul style="list-style-type: none"> <li>Although Alternative 4 could theoretically affect subsistence, it is likely that few, if any, of the same individual NFSs used for research would be included in the subsistence harvest. This is especially true if cooperative co-management agreements continue into the future. Thus, direct effects related to the implementation of Alternative 4 are considered negligible. Additionally, Alternative 4 would have a negligible indirect effect on the subsistence harvest of NFSs.</li> </ul>
Cumulative	<ul style="list-style-type: none"> <li>For subsistence hunters living in small communities, the implementation of Alternative 1 has the potential to create major cumulative effects, including decrease in educational outreach by visiting research staff and a drop in economic interaction with local business owners. Larger communities, specifically St. George and St. Paul, would be less affected.</li> <li>Economic and educational concerns are relatively independent from effects on subsistence, in that Alternative 1 would have negligible effects on the NFS subsistence harvest in a direct or indirect way. Regardless, the decreased economic and educational interaction may result in cumulative effects that would be moderate in some communities.</li> </ul>	<ul style="list-style-type: none"> <li>For all communities within the study area associated with NFS subsistence harvesting, the implementation of Alternative 2 has the potential to create minor cumulative effects. Alternative 2 would only directly affect the subsistence harvest in a minor capacity, but it would have a negligible indirect effect on the NFS subsistence harvest. Educational and economic interactions are not expected to decrease by a meaningful amount, and these interactions are not likely to negatively combine with the minor direct effect related to increased surveying. Thus, Alternative 2 would likely result in cumulative effects that would be minor.</li> </ul>	<ul style="list-style-type: none"> <li>For all communities within the study area, the implementation of Alternative 3 would not likely result in any cumulative effects. As Alternative 3 would reinstate the activities permitted before the court order, it is generally assumed that subsistence activities and community interactions would return to levels present before the permits were vacated. As such, there would not likely be a change from the existing conditions outlined in Chapter 3.</li> </ul>	<ul style="list-style-type: none"> <li>For all smaller communities within the study area associated with NFS subsistence harvesting, the implementation of Alternative 4 has the potential to create major interactive community effects. This is particularly true for smaller, rural communities and other communities that, under Alternative 4, would experience interactions with research staff for the first time. Subsistence harvesters of NFSs could theoretically be affected directly in ways that are ultimately dependent on the level of overlap between NFS subsistence populations and those studied by researchers. This possibility could be minimized through co-management agreements and harvesting methodologies. Regardless, these effects would combine with the increased economic, educational, and sociocultural interactions that are possible under Alternative 4 and could create major effects for smaller, more rural communities. This is especially true if new economic gains are invested in educational opportunities, or if increased sociocultural interactions can be used to negotiate more sensitive cooperation between subsistence harvesters and researchers. These negotiations would bolster the co-management agreements already in place and have the possibility of mitigating the direct effects of Alternative 4 on the subsistence harvest.</li> </ul>



**Table ES-14  
Summary of Direct/Indirect and Cumulative Effects - Direct Interactions with Communities during Research - Section 4.9.2**

Effect	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 (Preferred Alternative) Research Program with Full Implementation of Conservation Goals
Direct/Indirect	<ul style="list-style-type: none"> <li>Although there would be a decrease in economic interaction between research staff and local community members under Alternative 1, it is unlikely that this decrease would result in a substantial direct effect. Additionally, as interaction would decrease generally under Alternative 1, sociocultural effects are not likely to be substantially positive or negative. Educational opportunities would likely decline under Alternative 1, however, potentially creating a substantial effect in at least some communities. Indirect effects associated with the implementation of Alternative 1 are considered to range from minor to negligible.</li> </ul>	<ul style="list-style-type: none"> <li>Although there would be a decrease in economic interaction between research staff and local community members under Alternative 2, it is unlikely that this decrease would result in a substantial direct effect. Additionally, as interaction would decrease generally under Alternative 2, sociocultural effects are not likely to be substantial. Educational opportunities would likely continue under Alternative 2, albeit in a limited fashion, in a manner unlikely to directly affect the community. Indirect effects associated with the implementation of Alternative 2 are considered to range from minor to negligible.</li> </ul>	<ul style="list-style-type: none"> <li>As Alternative 3 would reinstate the status quo, community interactions would continue in a manner present before the court order. Therefore, economic, educational, and sociocultural interactions are not likely to be directly or indirectly affected by the implementation of Alternative 3. Effects are considered negligible under this alternative.</li> </ul>	<ul style="list-style-type: none"> <li>Due to the proposed intensity and wide geographic range of research under Alternative 4, direct effects related to the increased economic interaction are considered to be major, at least on a localized basis in some communities. Educational opportunities would likely increase under Alternative 4, potentially creating at least a minor positive effect on some local communities. It is unlikely, however, that sociocultural effects would increase substantially. This is especially true if community collaboration is continued under this alternative. Therefore, direct effects associated with sociocultural interactions are considered to be negligible. The indirect effects would be most like those experienced under Alternative 3. Therefore, indirect effects associated with the implementation of Alternative 4 are also considered negligible.</li> </ul>
Cumulative	<ul style="list-style-type: none"> <li>For the largely Alaska Native communities of St. George and St. Paul, the implementation of Alternative 1 has the potential to create major interactive community effects. The direct effects potentially experienced by these communities include a moderate decrease in educational outreach by visiting research staff. There is also a possibility that local business owners would lose a moderate amount of business from an absence of regularly visiting research staff. These educational and economic concerns interact with the indirect effects of Alternative 1 related to the subsistence harvest of SSLs in the Pribilofs, which were outlined previously. These indirect effects would potentially result in research that would become outdated as environmental conditions and the status of SSL populations change. These effects have the potential to greatly reduce an important facet of traditional and community life (the subsistence harvest of SSLs), while also affecting the economic and educational opportunities in these communities, which are already economically constrained and comparatively lacking in educational opportunities for young people. Together, the interaction of these effects would likely create a moderate effect.</li> </ul>	<ul style="list-style-type: none"> <li>For St. George and St. Paul, the implementation of Alternative 2 has the potential to create negligible interactive community effects. In contrast to the effects under Alternative 1, moderate economic and educational effects are not likely under Alternative 2. Indirectly, Alternative 2 is somewhat likely to affect the subsistence harvest, as its implementation would potentially result in research that would become outdated as factors change over time or that is not supported by other types of more direct research on SSLs. Because NFS subsistence harvesting is of more importance than SSL harvest in the Pribilof Islands and because economic and educational effects present under Alternative 1 are relatively absent under Alternative 2, the communities of St. George and St. Paul would experience negligible interactive community effects from Alternative 2.</li> </ul>	<ul style="list-style-type: none"> <li>For all communities within the study area, the implementation of Alternative 3 does not have the potential to create any cumulative effects. Under Alternative 3, it is generally assumed that subsistence activities and community interactions would occur. As such, there would not likely be a change from the existing conditions outlined in Chapter 3.</li> </ul>	<ul style="list-style-type: none"> <li>The implementation of Alternative 4 has the potential to create interactive community effects ranging from minor to major in scope, depending on the nature of the local community. The direct effects potentially experienced by individual communities would likely include a moderate increase in the amount of money spent by visiting researchers on minor supplies and repairs to equipment. With more researchers also comes the possibility of an increase in the amount of educational outreach and volunteer opportunities for young people in these communities. The increased geographic range and higher intensity of research on SSLs are somewhat likely to create a moderate effect on subsistence harvesters in the Pribilof Islands, depending on the amount of overlap between SSLs used for research and subsistence. As NFS subsistence harvesting is paramount in these communities, a decline in SSL subsistence harvesting would not be as substantial as would be a decline in NFS harvesting. Increased economic activity (in an area historically constrained) and increased educational opportunities, taken together, could create major opportunities for local community members in St. George and St. Paul. This is especially true if money from moderate economic growth is invested in the new educational opportunities. It is possible that the communities of St. George and St. Paul could experience a period of effervescence brought about by the interactive community effects related to the implementation of Alternative 4.</li> </ul>



**Table ES-15  
Summary of Direct/Indirect and Cumulative Effects - Environmental Justice Effects - Section 4.9.4**

<b>Effect</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 (Preferred Alternative) Research Program with Full Implementation of Conservation Goals</b>
Direct/Indirect	<ul style="list-style-type: none"> <li>• Environmental Justice concerns are present in the Pribilof Islands and potentially in other small, coastal Alaska communities due to both direct and indirect effects.</li> </ul>	<ul style="list-style-type: none"> <li>• Environmental Justice concerns are present in the Pribilof Islands and other small, coastal Alaska communities due to indirect effects.</li> </ul>	<ul style="list-style-type: none"> <li>• Environmental Justice concerns are negligible under Alternative 3.</li> </ul>	<ul style="list-style-type: none"> <li>• Environmental Justice concerns are present in the Pribilof Islands and potentially in other small, coastal Alaska communities due to direct effects.</li> </ul>
Cumulative	Not Applicable	Not Applicable	Not Applicable	Not Applicable





## **7.0 Next Steps**

This executive summary is a snapshot of the contents of the Steller Sea Lion and Northern Fur Seal Research Draft Programmatic EIS. Following release of this Draft EIS, a 45-day public comment period will occur, including three public meetings which will be announced and are likely to be conducted in Silver Spring, Maryland, Seattle, Washington, and Anchorage, Alaska, allowing the public to comment on the contents of the EIS. Considering public comments received during this period, the Agency will make its final decision concerning the Preferred Alternative and produce the Final EIS. For updates on the Draft Programmatic EIS, please visit the NMFS website at <http://www..nmfs.noaa.gov/pr/permits/eis/steller/htm>.

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