U.S. Fish & Wildlife Service

Final Supplemental Environmental Impact Statement

Translocation of Southern Sea Otters

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Prepared by
U.S. Fish & Wildlife Service
Ventura Fish and Wildlife Office
Ventura, California

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Appendices

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List of Appendices

Appendix A: Public Law 99-625

PUBLIC LAW 99–625 [H.R. 4531]; November 7, 1986

FISH AND WILDLIFE PROGRAMS: IMPROVEMENT

An Act to improve the operation of certain fish and wildlife programs.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SECTION 1. TRANSLOCATION OF CALIFORNIA SEA OTTERS.

(a) DEFINITIONS.—For purposes of this section—

(1) The term "Act" means the Endangered Species Act of 1973 (16 U.S.C. 1531 et seq.).

(2) The term "agency action" has the meaning given that term in section 7(a)(2) of the Act.

(3) The term "experimental population" means the population of sea otters provided for under a plan developed under subsection (b).

(4) The phrase "parent population" means the population of sea otters existing in California on the date on which proposed regulations setting forth a proposed plan under subsection (b) are issued.

(5) The phrase "prospective action" refers to any prospective agency action that—

(A) may affect either the experimental population or the parent population; and

(B) has evolved to the point where meaningful consultation under section 7(a) (2) or (3) of the Act can take place.

(6) The term "Secretary" means the Secretary of the Interior.

(7) The term "Service" means the United States Fish and Wildlife Service.

(b) PLAN SPECIFICATIONS.—The Secretary may develop and implement, in accordance with this section, a plan for the relocation and management of a population of California sea otters from the existing range of the parent population to another location. The plan, which must be developed by regulation and administered by the Service in cooperation with the appropriate State agency, shall include the following:

(1) The number, age, and sex of sea otters proposed to be relocated.

(2) The manner in which the sea otters will be captured, translocated, released, monitored, and protected.

(3) The specification of a zone (hereinafter referred to as the "translocation zone") to which the experimental population will be relocated. The zone must have appropriate characteristics for furthering the conservation of the species.

(4) The specification of a zone (hereinafter referred to as the "management zone") that—

(A) surrounds the translocation zone; and

(B) does not include the existing range of the parent population or adjacent range where expansion is necessary for the recovery of the species.

The purpose of the management zone is to (i) facilitate the management of sea otters and the containment of the experimental population within the translocation zone, and (ii) to prevent, to the maximum extent feasible, conflict with other fishery resources within the management zone by the experimental population. Any sea otter found within the management zone shall be treated as a member of the experimental population. The Service shall use all feasible non-lethal means and measures to capture any sea otter found within the management zone and return it to either the translocation zone or to the range of the parent population.

(5) Measures, including an adequate funding mechanism, to isolate and contain the experimental population.

(6) A description of the relationship of the implementation of the plan to the status of the species under the Act and to determinations of the Secretary under section 7 of the Act.

(c) STATUS OF MEMBERS OF THE EXPERIMENTAL POPULATION.—(1) Any member of the experimental population shall be treated while within the translocation zone as a threatened species for purposes of the Act, except that—

(A) section 7 of the Act shall only apply to agency actions that—

(i) are undertaken within the translocation zone,

(ii) are not defense-related agency actions, and

(iii) are initiated after the date of the enactment of this section; and

(B) with respect to defense-related actions within the translocation zone, members of the experimental population shall be treated as members of a species that is proposed to be listed under section 4 of the Act.

For purposes of this paragraph, the term "defense-related agency action" means an agency action proposed to be carried out directly by a military department.

(2) For purposes of section 7 of the Act, any member of the experimental population shall be treated while within the management zone as a member of a species that is proposed to be listed under section 4 of the Act. Section 9 of the Act applies to members of the experimental population; except that any incidental taking of such a member during the course of an otherwise lawful activity within the management zone, may not be treated as a violation of the Act or the Marine Mammal Protection Act of 1972.

(d) IMPLEMENTATION OF PLAN.—The Secretary shall implement the plan developed under subsection (b)—

(1) after the Secretary provides an opinion under section 7(b) of the Act regarding each prospective action for which consultation was initiated by a Federal agency or requested by a prospective permit or license applicant before April 1, 1986; or

(2) if no consultation under section 7(a)(2) or (3) regarding any prospective action is initiated or requested by April 1, 1986, at any time after that date.

(e) CONSULTATION AND EFFECT OF OPINION.—A Federal agency shall promptly consult with the Secretary, under section 7(a)(3) of the Act, at the request of, and in cooperation with, any permit or license applicant regarding any prospective action. The time limitations applicable to consultations under section 7(a)(2) of the Act apply to consultations under the preceding sentence. In applying section 7(b)(3)(B) with respect to an opinion on a prospective action

that is provided after consultation under section 7(a)(3), that opinion shall be treated as the opinion issued after consultation under section 7(a)(2) unless the Secretary finds, after notice and opportunity for comment in accordance with section 553 of title 5, United States Code, that a significant change has been made with respect to the action or that a significant change has occurred regarding the information used during the initial consultation. The interested party may petition the Secretary to make a finding under the preceding sentence. The Secretary may implement any reasonable and prudent alternatives specified in any opinion referred to in this subsection through appropriate agreements with any such Federal agency, prospective permit or license applicant, or other interested party.

(f) CONSTRUCTION.—For purposes of implementing the plan, no act by the Service, an authorized State agency, or an authorized agent of the Service or such an agency with respect to a sea otter that is necessary to effect the relocation or management of any sea otter under the plan may be treated as a violation of any provision of the Act or the Marine Mammal Protection Act of 1972 (16 U.S.C. 1361 et seq.).

SEC. 2. ATCHAFALAYA NATIONAL WILDLIFE REFUGE.

Section 303 of the Act entitled "An Act to extend the Wetlands Loan Act", approved October 26, 1984 (16 U.S.C. 668dd note), is amended—

(1) by striking out "minor" in subsection (a)(2); and

(2) by striking out "Public Law 98–396" in subsection (b) and inserting "appropriations Acts".

SEC. 3. DUCK STAMP ACT.

The first sentence of section 2(b) of the Act of March 16, 1934 (16 U.S.C. 718b), commonly known as the Duck Stamp Act, is amended by inserting "available for obligation and" before "attributable to".

SEC. 4. CONVEYANCE OF FISH HATCHERY TO STATE OF NEW HAMPSHIRE.

Notwithstanding any other law, the Secretary of the Interior and the Secretary of Agriculture shall convey, without reimbursement, to the State of New Hampshire no later than December 31, 1986, all of the right, title, and interest including the water rights, of the United States in and to the fish hatchery property located in the northwest corner of Berlin township in the White Mountain National Forest, New Hampshire, and known as the Berlin National Fish Hatchery, consisting of 510 acres, more or less, of land together with any improvements and related personal property thereon. The property conveyed shall be used by the New Hampshire Fish and Game Department as a part of the New Hampshire fishery resources management program and if it is used for any other purpose, title to such property shall revert to the United States.

Approved November 7, 1986.

Appendix B: Reinitiation of Formal Consultation on the Containment Program for the Southern Sea Otter (1-8-99-FW-81)

United States Department of the Interior

FISH AND WILDLIFE SERVICE

California/Nevada Operations Office
2800 Cottage Way, Room W-2606
Sacramento, California 95825

IN REPLY REFER TO:

JUL 19 2000

Memorandum

To: Field Supervisor, Ventura Fish and Wildlife Office, Ventura, California

From: Manager, California/Nevada Operations Office, Sacramento, California

Subject: Reinitiation of Formal Consultation on the Containment Program for the Southern Sea Otter (1-8-99-FW-81)

This document constitutes the U.S. Fish and Wildlife Service's biological opinion based on our review of the containment component of the translocation program authorized under Public Law 99-625 and its effects on the federally threatened southern sea otter (*Enhydra lutris nereis*), in accordance with section 7 of the Endangered Species Act of 1973, as amended (ESA). This document was prepared as a result of reinitiating intra-Service consultation on the containment program.

Reinitiation was prompted by the Service's receipt of substantial new information on the population status, behavior, and ecology of the southern sea otter that may reveal effects of the action on this species that were not previously considered. Specifically, the following information and circumstances prompted this reinitiation:

1. In the winters of 1997-98 and 1998-99, southern sea otters moved into the management zone in numbers that were much greater than had previously occurred during the preceding 11 years of the translocation program.

2. Analysis of carcasses has shown that southern sea otters are being exposed to environmental contaminants and diseases which could be affecting the health of the population.

3. The number of southern sea otters range-wide has been declining, based on information obtained from regular surveys.

4. More recent information indicates that southern sea otters at San Nicolas Island may not be isolated from the potential effects of a single, large oil spill. Consequently, a larger

range occupied by southern sea otters along the mainland coast is important for their protection from oil spills.

5. Given that the population along the mainland has been declining, the capture and release of large numbers of southern sea otters may have adverse effects that were not considered in the original biological opinion.

The following information was used to prepare this biological opinion: Public Law 99-625; the regulations which implement Public Law 99-625 (50 *Code of Federal Regulations* 17.84(d)); the final environmental impact statement for the translocation program (Service 1987a); the original biological opinion on the translocation program (Service 1987b); a report on the population status of the southern sea otter (U.S. Geological Survey - Biological Resources Division [BRD] 1998); a summary of the movement of southern sea otters into the southern Santa Barbara County area (California Department of Fish and Game [CDFG] 1998); numerous articles on disease, the potential effects of contaminants on southern sea otters, and other potential sources of mortality; the original recovery plan and drafts of revised recovery plans for the southern sea otter (Service 1982, 1995a, 2000); draft reviews of the translocation program (Service 1992, 1993); and internal documents contained in the Service's files. Information regarding the establishment of a colony of southern sea otters at San Nicolas Island was also used in developing this biological opinion. A complete administrative record of this consultation is on file at the Service's Ventura Fish and Wildlife Office.

The Service is also evaluating whether the failure criteria for assessing the translocation program, of which the containment program is a component, have been met; these criteria are provided in the regulations which implement Public Law 99-625. Although much of the information on southern sea otters and the history of the programs is relevant to both reviews, the evaluation and section 7(a)(2) consultation are being conducted as separate processes. Drafts of the evaluation and the biological opinion were provided, in March 1999, to the Marine Mammal Commission, the CDFG, and the Biological Resources Division, U.S. Geological Survey for their review and comment and to generate discussion on the future management of the southern sea otter with regard to the translocation program and the management zone. The documents have also been provided to the public to elicit comments on the information in them and any new information relevant to the issue.

The Service received 16 comment letters on the draft biological opinion and evaluation. A list of those who provided comments is attached. Several letters voiced support or opposition for a given course of action. These letters discussed the effects of southern sea otters on marine ecosystems and their opinions ranged from noting that shellfish resources are depleted by the presence of otters to concluding that the overall biological diversity of an area is enriched by the presence of southern sea otters. The Marine Mammal Commission's and California Coastal Commission's comments included direction on procedures they believe the Service must undertake if it desires to alter the current translocation or containment programs. Numerous letters requested clarification of particular points in the biological opinion. Others noted that

southern sea otters probably did not occur in large numbers in the current management zone historically because of hunting by native Americans and natural oil seepage.

The CDFG provided the most extensive set of comments on the biological opinion. In general, the CDFG voiced opposition to any change in the current management zone, disputed portions of the history and background of the translocation and containment programs as described in the biological opinion, and disagreed with the overall conclusion of the Service.

In this final biological opinion, we have clarified statements in the draft opinion that generated confusion among some reviewers. We have not addressed issues that are not relevant to the primary purpose of this biological opinion, which is to determine whether continuation of the containment program is likely to jeopardize the continued existence of the southern sea otter. Consequently, we have not addressed comments regarding, for example, the efficiency (as opposed to lethality) of the methods used by the Service to capture southern sea otters in the management zone or the effects of the southern sea otter on the shellfish industry or recreational fishing.

Based in part on this biological opinion and in part on other significant new information relevant to the translocation program that has become known since the program was initially reviewed under the National Environmental Policy Act (NEPA) in 1987, including the recent decline in the southern sea otter population, the Service intends to undertake a comprehensive review of the translocation program under NEPA and evaluate: whether the program, or some of its components, should continue; modifications to the program; and termination of the program. Through the NEPA process, which affords a full opportunity for public review and comment, the Service will analyze the translocation program and alternatives to the program and likely propose modifications to 50 CFR 17.84, the regulations that implement the translocation program authorized under Public Law. 96-625.

BACKGROUND

Definitions

For the purposes of this biological opinion, "southern sea otter" will always be used when referring to the listed population of the sea otter which occurs along the coast of California. "Sea otter" will always be used when referring to the species, which also occurs along the coasts of Washington, Canada, Alaska, and Russia.

"Parent range" refers to the region along the central coast of California, north of Point Conception and the management zone, where the population of southern sea otters resided at the time the translocation program was initiated. "Translocation zone" refers to the area around San Nicolas Island defined at 50 CFR 17.84 to which southern sea otters from the parent range were translocated. "Management zone" refers to the area south of Point Conception, but not including the translocation zone, from which southern sea otters are to be excluded. Pursuant to Public

Law 99-625, any southern sea otter found within either the translocation zone or the management zone is considered to be a member of the "experimental population." The attached maps depict all of the locations cited in this biological opinion.

The translocation program technically includes both the movement of southern sea otters from the parent range to San Nicolas Island and containment activities aimed at keeping southern sea otters from the management zone. However, for the purposes of this biological opinion, "translocation program" will be used to refer only to the capture and transport of southern sea otters from the parent range to San Nicolas Island. "Containment" will be used to refer only to the removal of southern sea otters from the management zone.

Public Law 99-625

The recovery plan (Service 1982) for the southern sea otter set forth recovery goals which included minimization of risk from potential oil spills and the establishment, via translocation, of at least one additional breeding colony outside the range that existed at that time. The dual goals of the translocation effort, as stated in the final environmental impact statement (Service 1987a), were to reduce the probability that more than a small portion of the population could be decimated by any single natural or human-caused catastrophe and to allow additional data to be obtained for assessing translocation and containment techniques, population status, and the influence of southern sea otters on the nearshore community. Translocation was viewed as paramount to achieving recovery and establishing a data base for identifying the optimal sustainable population level for the southern sea otter as required under the Marine Mammal Protection Act (MMPA).

Translocation of a listed species is generally authorized under the ESA and, under certain specific circumstances, translocation of species to establish experimental populations is authorized under section 10(j) of the ESA. The southern sea otter, however, is protected by both the ESA and the MMPA, and prior to the amendments of 1988, the MMPA did not allow translocation for the purpose of conservation. Additionally, opposition from commercial fishing and other interests presented an obstacle to the establishment of a second colony. These dilemmas were resolved in 1986 with the passage of Public Law 99-625 which allowed the translocation of southern sea otters and the establishment of a management zone surrounding the translocation zone from which southern sea otters would be removed.

Public Law 99-625 specifically authorized and provided the mechanisms by which the Service could establish a second colony of southern sea otters through translocation of animals to San Nicolas Island, the site that was ultimately chosen by the Service. The legislation allowed the Service to develop a translocation plan that was included as an appendix to the environmental impact statement (Service 1987a). This translocation plan:

1. described the number, age, and sex of southern sea otters to be translocated;

2. described the methods of capture, translocation, release, monitoring, and protection;

3. specified a translocation zone where southern sea otters would be relocated;

4. specified a management zone, which would surround the translocation zone but would not include the existing range of the southern sea otter or adjacent areas where expansion is needed for the recovery of the species;

5. described measures to isolate and contain the experimental population, backed up by an adequate funding mechanism;

6. described the relationship of translocation to the status of the species and to future section 7 determinations relative to either the parent population or the experimental population; and

7. provided for administration of the plan in cooperation with the State of California.

Public Law 99-625 also states that all containment of southern sea otters must be accomplished using non-lethal techniques. The legislation provides that southern sea otters within the translocation zone will be treated as a threatened species for the purposes of the section 7 consultation process; however, southern sea otters will be treated as a species proposed for listing in relation to activities conducted by the Department of Defense. Southern sea otters within the management zone are also treated as a species proposed for listing. Section 9 of the ESA applies to the experimental population, except that otherwise lawful activities within the management zone are exempted from the prohibitions against take under both the ESA and the MMPA.

Translocation and the Translocation Zone

The purpose of the translocation zone is described above under the section entitled "Public Law 99-625." The Service evaluated potential translocation sites along the entire west coast of the United States (Service 1987a). The evaluation recommended four sites as suitable for translocation: San Nicolas Island, the coast of northern California, the coast of southern Oregon, and the coast of northern Washington (52 *Federal Register* 29784). San Nicolas Island was selected as the preferred translocation site because: the habitat is highly suitable for southern sea otters; the protection of the colony and law enforcement needs could be more easily met; its isolated and insular nature, surrounded by wide, deep ocean areas, offered the greatest potential for containment; it offered the least potential conflict with shell fisheries; and the potential for a well-designed research program appeared better than at other sites (Service 1987a).

The final environmental impact statement for the translocation program (Service 1987a), the translocation plan, and the regulations which implement Public Law 99-625 (at 50 CFR 17.84(d)(3)) describe the methods by which southern sea otters would be captured, moved to the translocation zone, and released. A maximum of 70 southern sea otters would be moved to San Nicolas Island during the first year of the program. This number could have been supplemented with up to 70 animals annually in subsequent years, if necessary, to ensure the success of the translocation and prevent the nucleus group from declining into an irreversible downward trend. The maximum number to be moved was limited to 250 animals. The goal was to ensure that

approximately 70 southern sea otters would remain at the island and form a nucleus of breeding animals from which the new colony would grow toward the carrying capacity of the environment. The Service anticipated that the population at San Nicolas Island would eventually reach the carrying capacity of the habitat, which was estimated at a minimum of 280 in as few as 11 or as many as 30 years. In the preamble to the final rule (52 *Federal Register* 29754), the Service estimated that the carrying capacity at San Nicolas Island could be as high as 400 to 500 animals.

Southern sea otters were to be removed primarily from the southern third of the parent population. Diver-held devices, dip nets, surface entangling nets, or other methods that were proven to be safe and effective were to be used to capture southern sea otters. All captured southern sea otters would be tagged and examined by a veterinarian familiar with marine mammals.

All captured animals would be transported directly to the translocation zone or held in specially constructed holding facilities prior to transport. Southern sea otters would be released directly into the wild at the translocation site or held for up to 5 days in secured floating pens. The regulations implementing Public Law 99-625 specified that no more than 10 southern sea otters could be held in a single pen and that adult males would be held separately. The release of the animals to the wild from the pens would be passive; that is, the doors to the pens would be opened and the southern sea otters allowed to leave as they desired.

The regulations also specified that monitoring of the parent and experimental populations must be conducted. The parent population was to be studied to assess the effects of the removal of the translocated animals and to determine its growth and changes in range. Monitoring of the translocation zone was to include intensive studies of the nearshore ecosystems at San Nicolas Island and documentation of numerous aspects of the ecology and behavior of southern sea otters. Much of the research that was envisioned has occurred. Some research proved to be unfeasible and some activities, primarily monitoring, are ongoing.

Between August 1987 and March 1990, 139 southern sea otters were translocated to San Nicolas Island; one additional southern sea otter was released there after rehabilitation at the Monterey Bay Aquarium. (In different reports on the translocation program, the rehabilitated southern sea otter is variously added into or left out of the total number of individuals translocated to San Nicolas Island. In referring to numbers of individuals moved to San Nicolas Island in this biological opinion, we use the word "translocated" only when we are certain the numbers refer to translocated individuals.) By July 1988, after the first year of translocation efforts, 69 southern sea otters had been transported to the island, but only 20 could be located at the island. Three of the original 69 animals died at the island before they were released, two were found dead on the mainland, and one was recaptured and removed from the management zone (Service 1988). Two southern sea otters, a female and her pup, that entered the management zone were captured as part of the containment program and returned to the parent range; the pup was presumed to have died shortly thereafter (Sanders pers. comm. 2000). An additional four southern sea otters died at Monterey Bay Aquarium before they could be transferred to San Nicolas Island; these individuals are not included in the numbers used to describe the translocation program.

By the end of the second year of translocations, a total of 126 southern sea otters had been moved to San Nicolas Island, but only 17 remained at the island. Thirteen additional southern sea otters were translocated to San Nicolas Island in 1990, with the last translocation occurring in July 1990 (Service 2000). At the end of that year, the population at San Nicolas was estimated at 15 animals (Service 1990).

Southern sea otters were not translocated to San Nicolas Island during 1991 for several reasons (Service 1991). State and Federal permits were not issued in time. Coordination with the California Coastal Commission also required additional time. Finally, the tank space at Monterey Bay Aquarium needed to hold southern sea otters for evaluation by veterinarians was being used for rehabilitating stranded individuals. (The aquarium routinely cares for and releases, if possible, stranded and injured southern sea otters; the individuals using the tank space in 1991 were not associated with the translocation program.)

During the translocations that had occurred through 1990, the Service noted that the release of four or more southern sea otters at San Nicolas Island within1 week apparently disrupted the behavior of the previously released animals (Service 1990). To address this potential problem, the Service decided to release no more than four individuals at any one time (Service 1990). Later, the Service ceased additional translocations to eliminate the possibility that the addition of new animals would disturb resident southern sea otters. Through this process, we hoped that the fledgling colony at San Nicolas Island would grow and eventually become established (Benz pers. comm. 2000).

After carefully reviewing the annual reports, we have compiled the following summary of the fates of animals involved in the translocation and containment programs. A minimum of 36 of the 140 southern sea otters released at San Nicolas Island are known to have returned to the parent range along the central coast of California; in addition, 11 were captured in the management zone and released back into the parent range (Service 1993). Three southern sea otters died at San Nicolas Island in the holding pens prior to being released (Service 1988). As of 1993, seven southern sea otters had been found dead in the management zone; six of these were confirmed as translocated individuals (Service 1988, 1989, 1990, 1991). Four individuals that had been translocated to San Nicolas Island were found dead in the parent range (Service 1992a, 1993a). At least 7 animals that had been translocated were known to have taken up residence at San Miguel Island; most of the 11 independent southern sea otters at San Nicolas Island as of 1993 were recognizable as having been translocated to the island (Service 1993a). A minimum of approximately 73 southern sea otters is missing. (At this time, we cannot provide a precise number of missing animals because some individuals may be counted in two of the above classes; for example, the four animals that were found dead in the parent range may also be included in the 36 that were known to have returned to the mainland. Also, the annual reports do not precisely state how many of the individuals remaining at San Nicolas Island are translocated animals.) The remaining animals may have emigrated from the translocation zone or died. Although a southern sea otter was known to have been entrapped in a lobster trap at Santa Cruz Island and similar traps are abundant at San Nicolas Island, no study to confirm this as a source of mortality has been undertaken because of the difficulty of carrying out such an investigation.

Containment and the Management Zone

Section 1(b)(4)(B) of Public Law 99-625 provides that the purpose of the management zone is to "facilitate the management of [southern] sea otters and the containment of the experimental population within the translocation zone, and to prevent, to the maximum extent feasible, conflict with other fishery resources within the management zone by the experimental population" by requiring the capture of southern sea otters found within it and their transfer to the parent range or translocation zone. The management zone is depicted on the attached maps. It generally can be described as the area south of Point Conception, Santa Barbara County, with the exception of the translocation zone. At the time of the legislation, the range of the southern sea otter did not extend as far south as the management zone.

The containment program was intended to prevent southern sea otters from dispersing from and becoming established at sites that were outside of the translocation zone and outside of the parent range (i.e., the management zone). The Service anticipated that containment would occur indefinitely unless the translocation program failed. Public Law 99-625 requires that all containment of southern sea otters must be accomplished using non-lethal techniques. The containment program called for the Service and the CDFG to jointly manage an effort to locate southern sea otters that leave the translocation zone and to remove, by non-lethal means, those that enter the management zone, either from the translocation zone or the parent range. Reports from other Federal and State agency personnel, commercial fishermen, boat skippers, and the general public were to be used to assist the Service and CDFG in locating southern sea otters in the management zone.

The methods by which southern sea otters were to be removed from the management zone are essentially the same as those described previously in this biological opinion for the capture of animals from the parent range. Southern sea otters within the management zone would be captured by experienced State and Federal personnel using appropriate methods such as diver held traps, surface entangling nets, or dip nets. The most effective capture technique identified to date involves a diver, equipped with a closed circuit oxygen re-breather, using a Wilson trap. This technique enables the diver to approach southern sea otters without producing the noise or odor associated with conventional SCUBA gear.

The translocation plan (appendix B in Service 1987a) notes that if "problems in maintaining the management zone free of [southern sea] otters were related to pressures exerted by growth and expansion of the donor (i.e., the parent) population, it may be possible to alleviate such pressure by implementing an experimental population thinning concept in the area immediately north of Point Conception and Point Arguello or another appropriate location." The translocation plan also notes that this action would be considered only if necessary to maintain the management zone so the entire translocation and establishment of the experimental population would not need to be declared a failure. Public Law 99-625 does not authorize such an action. The regulations (50 CFR 17.84(d)(6)) state that capturing animals within the management zone and returning them to the experimental or the parent population is the preferred method of containment. The regulations further note that artificial reduction of fecundity and selective or random, non-lethal removal of some individuals of the experimental population at San Nicolas Island are potential

mechanisms "to prevent significant emigration of southern sea otters from San Nicolas Island and occupation of habitat within the management zone." To implement such actions, the Service would need to seek additional authority or conduct an experimental program under the provisions of section 10(a)(1)(a) of the Act.

The Service predicted, based at least in part on previous successes that it and others had experienced in capturing large numbers of sea otters fairly easily, that all individuals entering the management zone could be captured and returned to the parent population. In reality, capturing southern sea otters through non-lethal means, as required by Public Law 99-625, proved to be difficult in many cases. In the late 1980s and early 1990s, the Service responded to sightings of southern sea otters in the management zone. The Service was often unable to find reported individuals again; if detected, capture efforts were not always successful. A specific example of the difficulty the Service experienced in capturing southern sea otters is provided in the section of this biological opinion entitled Previous Reviews of the Translocation Program.

Successful captures during containment efforts were often associated with the identification of particular areas where southern sea otters tended to congregate, such as Cojo Anchorage and San Miguel Island. These efforts were successful largely because the Service could travel directly to a known location, rather than spending time in often futile searches for individuals that may not be staying in a single location for long periods. The large size of the management zone - it extends from Point Conception to the Mexican border and includes all of the Channel Islands, with the exception of San Nicolas - hindered search and capture efforts. The difficulties the Service experienced in finding the occasional animal that strayed into the management zone called into question the Service's ability to contain large numbers of southern sea otters.

All southern sea otters captured in the management zone have been returned to the parent range. We concluded that, because of the high rate of emigration from San Nicolas Island, southern sea otters returned to the parent range would have a greater likelihood of not returning to the management zone than if they were taken to San Nicolas Island. Initially, southern sea otters captured in the management zone which had traveled there from San Nicolas Island were returned to the site of their original capture prior to being translocated. However, because of the difficulty and time involved in reaching some of these remote sites, the Service eventually released all southern sea otters captured as part of the containment effort at two sites in Santa Cruz County. Male southern sea otters were released in the vicinity of a male group; females were released near a female group.

Failure Criteria for the Translocation Program

The regulations that implement Public Law 99-625 identified five criteria for determining whether the translocation program is a failure (50 CFR 17.84(d)(8)). According to the regulations, the translocation would be considered to have failed if one or more of the following criteria are met:

1. If, after the first year following initiation of translocation or any subsequent year, no translocated otters remain within the translocation zone, and the reasons for emigration or mortality cannot be identified and/or remedied;

2. If, within 3 years from the initial transplant, fewer than 25 otters remain in the translocation zone and the reason for emigration or mortality cannot be identified and/or remedied;

3. If, after 2 years following the completion of the transplant phase, the experimental population is declining at a significant rate, and the translocated otters are not showing signs of successful reproduction (i.e., no pupping is observed); however, termination of the project under this and the previous criterion may be delayed if reproduction is occurring and the degree of dispersal into the management zone is small enough that the effort to remove otters from the management zone would be acceptable to the Service and the CDFG;

4. If the Service determines, in consultation with the affected State and the Marine Mammal Commission, that otters are dispersing from the translocation zone and becoming established within the management zone in sufficient numbers to demonstrate that containment cannot be successfully accomplished. This standard is not intended to apply to situations in which individuals or small numbers of otters are sighted within the management zone or temporarily manage to elude capture. Instead, it is meant to be applied when it becomes apparent that, over time, otters are relocating from the translocation zone to the management zone in such numbers that: (a) an independent breeding colony is likely to become established within the management zone; or (b) they could cause economic damage to fishery resources within the management zone. It is expected that the Service could make this determination within a year provided that sufficient information is available;

5. If the health and well-being of the experimental population should become threatened to the point that the colony's continued survival is unlikely, despite the protections given to it by the Service, State, and applicable laws and regulations. An example would be if an overriding military action for national security was proposed that would threaten to devastate the colony and the removal of otters was determined to be the only viable way of preventing loss of the individuals.

If, based on any one of these criteria, the Service were to conclude after consultation with the affected State and Marine Mammal Commission that the translocation has failed to produce a viable, contained experimental population, the original experimental population rulemaking would be amended to terminate the experimental population, and all southern sea otters remaining within the translocation zone would be captured and placed back into the range of the parent population. Efforts to maintain the management zone free of southern sea otters would be curtailed after reasonable efforts had been made to remove all southern sea otters that were within the management zone at the time of the decision to terminate the experimental population (e.g., after joint State and Service consultation concluded that additional effort would be futile).

Prior to declaring the translocation a failure, a full evaluation would be conducted into the probable causes, and if the causes could be determined and reasonable remedial measures identified, consideration would be given to continuing to maintain the experimental population. If such reasonable measures could not be identified and implemented, the results of the evaluation would be published in the *Federal Register* with the rulemaking proposing termination of the experimental population.

Previous Reviews of the Translocation Program

In March 1992, after 5 years of experience with the translocation and containment programs, the Service drafted a document for use as background and discussion material for a meeting with the CDFG to re-evaluate recovery efforts for the southern sea otter (Service 1992). The draft document included background material on the rationale for listing the southern sea otter as a threatened species, the recovery objectives of the recovery plan, a summary of the translocation program, identification of major issues affecting recovery, a discussion of containment in the management zone, and management options that could be employed to enhance recovery.

As stated in the draft document, in 1992, the major issues the Service viewed as affecting the recovery of the southern sea otter were the existence of the management zone and the feasibility of non-lethal containment techniques. The Service noted at the time that establishing a translocated population of southern sea otters at San Nicolas Island had proven to be difficult and that, since translocations of southern sea otters to San Nicolas Island had ceased, the number of individuals at the island had never exceeded 17. (In April 2000, 23 southern sea otters were counted at San Nicolas Island [Sanders pers. comm. 2000].) Further, the Service observed that even if a viable population were eventually established, a southern sea otter colony at San Nicolas Island may not provide substantial protection to the species in the event a large oil spill contacted the parent population. Observations from the *Exxon Valdez* oil spill demonstrated that impacts from such a spill could be far reaching. For example, oil dispersed from the *Exxon Valdez* spread over 400 linear miles in 30 days; this area greatly exceeds the present range of the southern sea otter, including San Nicolas Island. The efforts to contain the oil spilled from the *Exxon Valdez* and to capture and rehabilitate sea otters proved to be ineffective in protecting a substantial portion of the sea otter population.

The draft document also discussed the difficulty in containing southern sea otters. The Service noted that improvements in equipment (e.g., use of a rebreather which allows divers to approach animals without being detected) and greater experience in capturing southern sea otters were positive changes that would assist in containment. However, environmental factors, such as weather, the condition of the sea, and water clarity, remained the major factors that influence the success of capture efforts. As an example, four one-week-long trips, using a chartered vessel, and an additional trip with a Service vessel were made to San Miguel Island to attempt to capture 10 southern sea otters. This effort resulted in the capture of only two of the southern sea otters. Although the circumstances surrounding this capture effort may be those of a worst case scenario, it provides an example of the potential difficulty in maintaining the management zone.

The draft document stated that the long-term feasibility of non-lethal containment was possible provided that several assumptions on which the containment program had been based proved accurate. First, the number of animals in the management zone that needed to be captured would remain small. At the time the translocation program was conceived, rather abrupt movements of large numbers of sea otters had been observed on only a few occasions. At the time the translocation program began, the Service believed that, initially, it would need to capture a relatively small number of animals either moving through the management zone from the translocation zone or straying south from the parent population. Although it anticipated that the southward range expansion of the southern sea otter would eventually contact the management zone (Service 1987b), the Service did not specifically address the issue of containing large numbers of individuals in this area. However, because the Service was confident of being able to capture 70 individuals in a month for the translocation program, the issue of preventing southern sea otters from occupying the management zone had not seemed insurmountable at the time the translocation program was initiated. By the time of the draft evaluation, however, the Service had discovered that capture of even a small number of otters could prove difficult, time consuming and expensive.

The second assumption affecting the long-term feasibility of non-lethal containment noted by the Service was that captured southern sea otters would not return quickly to the management zone. The draft document noted, however, that this assumption was also inaccurate as experience with the translocation and containment programs had demonstrated the propensity for southern sea otters to return to the point of capture after their release into either the parent range or the translocation zone.

Finally, containment was assumed feasible if the habitat where captured southern sea otters were to be released was below carrying capacity. As of 1992, southern sea otters had not reached population levels which were thought to be near carrying capacity because only a few individuals remained at San Nicolas Island and the parent population had remained below the projected recovery level. However, the possibility existed that, as the translocation program matured and the southern sea otter population expanded, the carrying capacity of release sites might be exceeded. The final rule for the establishment of an experimental population of southern sea otters at San Nicolas Island (50 CFR 17.84(d)(6)) identifies artificial reduction of fecundity for some southern sea otters within the experimental population and selective or random, non-lethal removal of members of the experimental population within the translocation zone as potential means to keep southern sea otters from occupying the management zone, but reserves this authority. The preamble to the final rule (52 *Federal Register* 29754) notes that the Service would require additional authority to use these means "as a last resort" for keeping the management zone free of southern sea otters. Given that the population of the southern sea otter had not reached the levels necessary for the taxon to be considered recovered, we did not advocate implementing either of these reserved options.

The Service's draft document notes that, primarily because of the information gained from the *Exxon Valdez* spill, the recovery team for the southern sea otter now recommended that the delisting criteria (under the ESA) include many more individuals distributed over a larger area or a smaller increase in individuals and area, but with a substantial reduction in the risk of an oil

spill. The recovery team also recommended, in an internal draft of a recovery plan, that the southern sea otter be allowed to expand its range through natural processes and against further translocation efforts.

An additional factor considered in the Service's draft document was that southern sea otters were expanding their range to the south, toward the management zone, faster than they were to the north; this trend, which had been consistent throughout the recovery of the population in the 20th century was continuing. Based on the results of the translocation and containment programs, the new oil spill information, the trends in range expansion of the southern sea otter, and the recommendations of the recovery team, the draft document (Service 1992) concluded that the management zone could not be maintained in the long-term using available non-lethal techniques, and that the persistence of the management zone would reduce the options available to recover the southern sea otter and likely delay recovery.

In 1993, the Service prepared a second draft evaluation of the translocation and containment programs that assessed the status of the San Nicolas Island colony, translocation efforts and methods, containment efforts and methods, and the failure criteria (Service 1993b). The draft document noted that the degree of dispersal of southern sea otters from San Nicolas Island was much higher than anticipated. Only 11 adult southern sea otters and 4 dependent pups remained at San Nicolas Island (Service 1993).

The draft document also noted that the stress of being captured, held in captivity, and (for some individuals) undergoing surgery to implant tracking devices resulted in a mortality rate that was higher than anticipated, even though a mortality rate of three to five percent (Benz, pers. comm. in Service 1987b) had been expected to result from handling of southern sea otters during translocation. By the time of the 1993 draft evaluation, seven southern sea otters had died at Monterey Bay Aquarium while waiting to be translocated to San Nicolas Island or after surgery to implant radios, three died at San Nicolas Island while waiting to be released, one died after being captured in the parent range for translocation and released at the point of capture, and four died within two weeks of being released after being captured during containment activities. Additionally, one southern sea otter did not recover well after surgery to implant a radio. It was released in the hope that it would recover in the wild but was not seen again; its fate could not be determined but, given its condition upon release, it likely died. Without including the individual whose fate is unknown, 15 southern sea otters were known to have died as a result of the Service's containment and translocation actions. Table 1 summarizes the mortalities known to have occurred as a result of the program. Perhaps more importantly, the fates of most of the southern sea otters moved for translocation and containment purposes were unknown.

The draft document found that two of the failure criteria had been met. Failure criterion 2 states that the translocation program would be considered to have failed if fewer than 25 southern sea otters remain at San Nicolas Island within 3 years of the initial translocation and the reasons for emigration or mortality cannot be "identified and/or remedied." The draft document notes that the most recent survey completed at San Nicolas Island before its preparation detected only seven adult southern sea otters and four dependent pups (Service 1993b). (However, the annual report for this time period states that 11 independent southern sea otters and 4 pups were found (Service

1993a). The Service had not been able to identify why so few individuals remained or propose any action to remedy the problem. For these reasons, the draft document concluded the failure criterion had been met.

Failure criterion 3 states that the translocation program would be considered to have failed if the experimental population is declining and the translocated southern sea otters are not showing signs of reproduction. However, failure criterion 3 allows the Service to delay a determination of failure. It states that the termination of the translocation may be delayed under criteria 2 and 3 if reproduction is occurring and the degree of dispersal into the management zone is small enough that the effort to remove southern sea otters is acceptable to the Service and the State of California. The evaluation notes that 15 adult southern sea otters resided at San Nicolas Island in 1990 after the conclusion of the translocation. In 1993, the number of adults had declined to seven. (As noted in the previous paragraph, the annual report states that 11 independent animals were present (1993a)). Although some reproduction was occurring, most pups were either dying or leaving the island. The draft document noted that successful reproduction must translate into recruitment into the breeding population and concluded the failure criterion had been met. Although some pups may have subsequently bred, the population had not grown.

The Service's 1993 draft evaluation noted that the number of southern sea otters staying in the management zone was relatively small despite the fact that emigration from the translocation zone was high. Many animals apparently swam through the management zone en route to the parent range. If animals remained in the management zone, they were not detected despite routine aerial surveys, an active commercial fishery, and abundant onshore observers. The Service also noted that successful containment efforts, in the form of southern sea otters being found and captured, had resulted from the identification of key areas where individuals tended to congregate, such as Cojo Anchorage and San Miguel Island.

On December 13, 1993, the Service met with the CDFG to discuss the translocation and containment programs. The Service advised that the program had met certain failure criteria and that the translocation program no longer served the recovery purpose as identified in the 1982 recovery plan; the experience with the *Exxon Valdez* was a primary reason for the changed perspective on the value of translocation for recovery. In light of this information, the Service did not believe that the large expense of maintaining containment equipment and personnel could be justified. However, the Service was willing to delay a formal declaration of failure if the CDFG would accept responsibility for the containment program. The CDFG stated that it believed that a decision to declare the translocation a failure was premature and requested time to determine whether it could obtain funding to support the containment effort (CDFG 1999, comment 31 on the draft biological opinion). Because few southern sea otters were moving into the management zone at the time, CDFG believed the issue did not need to be resolved immediately.

On February 14, 1994, the CDFG responded that failure could not be declared on a biological basis because not enough time has passed to allow colonization of San Nicolas Island. The CDFG believed that the wording of the failure criteria allowed for continuation of the program because the Service had not attempted to identify or remedy the reasons for emigration or

mortality of southern sea otters transferred to San Nicolas Island. The CDFG recognized the Service's view that the translocation program no longer served the recovery purposes identified in the 1982 recovery plan and was concerned about the effect of southern sea otters on the shellfish industry (Service 1994). In its response to the draft of this biological opinion (CDFG 1999, comment 32), the CDFG notes that, although in 1994 it recognized our view with regard to recovery, it did not accept that our conclusion was "strongly supported by available data or biologically sound." The Service notified the CDFG that it could not provide funding for maintaining the management zone. Subsequently, the CDFG informed the Service that it had been unsuccessful at securing funds to manage the containment program on a long-term basis.

In 1995, the Service again raised concerns about the viability of maintaining the management zone for southern sea otters using non-lethal techniques. In a status report for the translocation program, the Service stated that containment activities were labor intensive and that, over the long-term, existing techniques were inadequate to maintain a management zone free of southern sea otters (Service 1995b). Finally, the Service noted that a decision regarding success or failure of the program was anticipated in the next year.

Between 1996 and 1999, the Service did not conduct any further evaluation of the translocation program. The Service submitted reports on the translocation program in its annual reports to Congress but these did not review the failure criteria.

Movement of Southern Sea Otters South of Point Conception

In the spring of 1998, approximately 100 southern sea otters moved south of Point Conception. This large-scale movement elicited numerous requests from the shellfish industry to remove these individuals. Throughout June and July, 1998, Service staff met with commercial fishermen, elected officials, environmental groups, and State and Federal agency personnel to describe the status of the southern sea otter population, discuss the prospects for containment, and consider the probability of its success. In August, the Service conducted public workshops in Santa Barbara and Monterey to solicit input from all stakeholders. One result of these events is that the Service is currently conducting the evaluation required by the implementing regulations of Public Law 99-625 to determine whether the translocation program should be determined a failure. By the fall of 1998, most of the southern sea otters had retreated north of Point Conception.

In December 1998, approximately 50 southern sea otters again inhabited the area south of Point Conception. Although the number of southern sea otters in the area decreased greatly during the summer, 152 individuals were present by January 1999. In May 1999, 58 southern sea otters were residing along the mainland coast from Point Conception to about Ventura. By October 1999, one dependent and three adult southern sea otters were observed at San Miguel Island during an aerial survey; an additional southern sea otter was found along the mainland. These were the only individuals detected in the management zone (Service 2000). As of February 2000, we were unaware of any southern sea otters along the mainland coast south of Point Conception (Sanders pers. comm. 2000). However, in May, 2000, 78 southern sea otters were

detected in the management zone during aerial surveys, roughly between Point Conception and Refugio State Beach (Harris email 2000).

Repeated expansions of southern sea otters into the management zone and subsequent retreats such as those experienced in the spring of 1998 through May of 2000 will likely continue until, at some point, if they are not contained, southern sea otters will likely become permanent residents of the current management zone. In Prince William Sound, Garshelis *et al.* (1984) believed that new areas are initially colonized by solitary, older males, followed by groups of males, that are investigating potential breeding territories.

CONSULTATION HISTORY

Public Law 99-625 established the legal basis for the translocation and containment programs and required the development of implementing regulations and a translocation plan. However, the methods by which the program would be implemented were left, in large measure, to the discretion of the Service. Prior to translocating and containing southern sea otters, the Service developed an environmental impact statement (Service 1987a) and an internal biological opinion (Service 1987b) which addressed the proposed translocation program and its component containment program.

Most of the discussion in the previous biological opinion addresses the translocation component of the southern sea otter program. However, several aspects of the translocation program, such as how southern sea otters are captured, handled, and transported, have relevance to the containment program. Despite the thoroughness of the translocation plan, the biological opinion noted that a mortality rate of 3 to 5 percent (or two to four individuals) was expected as a result of "actual translocation" (Benz, pers. comm. in Service 1987b). Stresses from capture, handling, and transport are identified as a source of mortality. In the biological opinion, the Service concluded that the translocation plan was efficient in terms of the manner in which southern sea otters would be captured, handled, transported, and released, and that it included measures to remedy known or suspected causes of stress. The Service further concluded that the level of incidental mortality associated with translocation was considered to be sufficiently low that it was not likely to jeopardize the continued existence of the southern sea otter.

The biological opinion did not specifically discuss mortality associated with containment, although it noted translocated southern sea otters could experience additional stress if they are captured a second time. The selection of San Nicolas Island as the translocation site, with its abundant resources and separation from the mainland, was thought to be the primary means by which southern sea otters would be prevented from entering the management zone from the translocation zone.

The preamble to the final rule for the establishment of the experimental population at San Nicolas Island noted that the purposes of containment included protection of the experimental population of southern sea otters at San Nicolas Island and maintenance of the integrity of the translocation effort as a whole (52 Federal Register 29754). The Service viewed minimizing the potential conflicts between the translocated population and oil and gas industry activities and

commercial and sport fisheries as essential for maintaining the integrity of the program. The Service also considered southern sea otters that moved into the management zone to be at heightened risk from legal human activities which could cause injury or death because Public Law 99-625 exempted such activities from the prohibitions of section 9 of the ESA. Promptly removing these individuals as part of the containment program would therefore promote their safety.

The biological opinion further notes that the establishment of Point Conception as the northern limit of the management zone was considered a mitigation measure to protect the shellfish fisheries that had developed south of the point after the extirpation of the southern sea otter from this area. In 1987, the Service (1987b) predicted that southern sea otters may reach Point Conception within 10 to 20 years and noted that Public Law 99-625 required the removal of these animals from the management zone. At the time, large numbers of southern sea otters did not travel south of the Santa Maria River mouth, which is approximately 65 kilometers north of Point Conception. The Service also predicted that southern sea otters would continue to expand their range to the north and reach the mouth of San Francisco Bay within 11 to 15 years. The 1982 recovery plan focused on establishing one or more new colonies outside of the range as it existed at that time, protecting the existing population and its habitat, and minimizing the threats from an oil spill. In summary, because the translocation was expected to result in a new, viable population of the southern sea otter outside of the then current range that would minimize the effects of an oil spill and expansion of the range would continue to the north, the Service (1987b) did not believe that the maintenance of a management zone from Point Conception south would preclude the recovery of the population.

The Service noted in the biological opinion, that unlimited range expansion "would not, in and of itself, necessarily assure recovery" and cited the recovery plan's goals of minimizing threats from oil spills and establishing one or more new colonies outside the existing range as being the more important factors. At that time, we did not anticipate that range expansion could be accompanied by a reduced population size. The Service predicted that, even with a southern boundary for range expansion at Point Conception, the southern sea otter population along the central coast would reach 2,910 individuals by the year 2000. Modeling conducted by the Minerals Management Service (1985 in Service 1987b) predicted that the central coast of California, north of Point Conception, was capable of supporting 3,582 southern sea otters. Based in part on the recovery plan's recommendations, the predicted increase in the southern sea otter population that the central coast north of Point Conception was thought to be capable of supporting, the Service concluded that the translocation program, with its component containment program, was not likely to jeopardize the continued existence of the southern sea otter.

BIOLOGICAL OPINION

DESCRIPTION OF THE PROPOSED ACTION

The proposed action is the continuation of the containment component of the translocation program as described at 50 CFR 17.84(d) and in the environmental impact statement for the translocation of southern sea otters to San Nicolas Island (Benz 1996, Service 1987a). The

containment program is described in the Background section of this biological opinion. Because the translocation of southern sea otters to San Nicolas Island has been completed, the remainder of the translocation program will not be discussed further in this section.

STATUS OF THE SPECIES/ENVIRONMENTAL BASELINE

The southern sea otter was listed as threatened in 1977 (42 *Federal Register* 2965); critical habitat was not designated. The factors leading to the listing included increased tanker traffic and the potential for oil spills, municipal pollution, and increased harassment caused by increased use of near-shore areas for a variety of human activities.

Distribution and Population Trends

The southern sea otter once ranged from at least northern California to the central coast of Baja California. (The historical northern range limit of the subspecies remains in question. Some authors place it as far north as Prince William Sound in Alaska; others contend that it extended only as far north as northern California or Oregon (Riedman and Estes 1990, Wilson *et al.* 1991). Prior to being protected from hunting for its pelt, the southern sea otter occurred only in a remnant colony near Bixby Creek along the Big Sur coast. Southern sea otters currently inhabit shallow waters along the coast of California in San Mateo, Santa Cruz, Monterey, San Luis Obispo, and Santa Barbara counties and at San Nicolas Island in Ventura County.

The following information on the population status of the southern sea otter is summarized from BRD (1998) unless otherwise noted. By the end of the 19th century, the sea otter had been hunted nearly to extinction throughout its range which extended from Japan, along the northern Pacific rim, to central Baja California; about a dozen colonies remained by 1911 when it was afforded protection from further hunting. Historically, the number of southern sea otters was estimated at 14,000 (Service 1995a); they were known to be abundant at San Nicolas Island. By 1911, the southern sea otter population had been reduced to a remnant colony near Bixby Creek along the Big Sur coast. Until the mid-1990s, the number of southern sea otters along the central coast of California had been generally increasing at a rate of approximately 4 to 6 percent per year (BRD 1998).

When reviewing any account of population trends of the southern sea otter, one must take into account variations in the census technique. In 1982, the Service and the CDFG standardized the survey methods for counting southern sea otters by relying primarily on shore-based counts. The shore-based counts helped to eliminate most of the variation in numbers that occurred when counting from aircraft. Riedman and Estes (1990) note that, prior to 1982, only general trends could be determined from the information received from the surveys.

Additionally, the surveys provide a count of the number of individuals that are in the population at a given time; the accuracy of the counts is affected by numerous factors, such as weather, the condition of the ocean, and the amount of kelp that is present. The surveys are not intended to be an estimate of the population; population estimates are provided by studies, such as mark-

recapture efforts. Biologists familiar with the southern sea otter and the census technique acknowledge that the actual number of animals in the population may be higher or lower than what is counted. Consequently, we rely on a 3-year running average of the numbers derived by the counts to assess population trends.

The number of southern sea otters increased to an estimated 1,789 in 1976. The estimated number of southern sea otters declined to 1,443 in 1979 and 1,277 in 1983. The decline was likely caused primarily by entanglement in coastal set-nets. Although the CDFG has recently noted that other factors may have contributed to this decline and that the change in census technique could have masked real differences in the number of individuals (CDFG 1999, comment 44 on the draft biological opinion), it instituted a limited emergency closure of the set-net fishery in 1982. This closure was based on the fact that entanglement deaths of southern sea otters were discovered in an observer program and the estimated loss rates of more than 100 individuals per year were sufficient to effect a population decline (Estes 1999). In 1985, the CDFG closed the entire range of the southern sea otter to set-nets in depths of less than 15 fathoms. From 1983 through 1989, the number of southern sea otters detected during spring counts increased from 1,277 to 1,856.

Southern sea otters continued to die from entanglement in nets, although in reduced numbers as the population size began to increase again following the 1985 closure. In 1991, the State of California closed waters less than 30 fathoms in depth to fishing with nets. The population size continued to increase until 1995, when the number of southern sea otters reached 2,377 (Service 1995a). Since that time and up until the most recent spring count in May 2000 , the numbers of animals detected during surveys had steadily declined to a low of 2,090 in the spring of 1999. (See attached table.) During the spring of 2000, 2,317 southern sea otters were counted. This number is within 60 of the number of southern sea otters that were counted in 1995, the last year the count was higher than the previous year. However, as noted previously in this biological opinion, the numbers of southern sea otters detected in any given count can be affected by numerous factors. Additionally, although the number of southern sea otters counted generally increased from 1982 through 1995, the number of individuals counted decreased in 1983, 1984, and 1990. Because of the large number of southern sea otters observed in the most recent count, the 3-year running average for the spring counts from 1998 through 2000 also indicates an apparent reversal of the recent decline in numbers. In summary, we do not view the information from the spring 2000 count as sufficient evidence to permit a conclusion that the recent decline of the southern sea otter population has been reversed; we could reach that conclusion based on the results of counts over the next few years. For these reasons, this biological opinion adopts a conservative approach and continues to view the population of the southern sea otter as being in a declining trend.

As stated above, the overall population of southern sea otters has generally increased during the 20th century, although there have been periods of population decline during this period. However, population trends and the extent of the range of the southern sea otter have not paralleled each other in recent decades. That is, the overall range of the southern sea otter has not retracted in response to declines in numbers of individuals. The attached map of the range of

the southern sea otter during the 20th century depicts changes in the range over time (Service 1987a). Table 2 depicts the changes in the numbers of individuals over time.

From the remnant colony at Bixby Creek, southern sea otters have expanded much farther south than north. By the late 1980s, the expansion of southern sea otters to the north had essentially stopped at Point Ano Nuevo. In 1998 and 1999 more sea otters were observed in the area north of Point Ano Nuevo during range-wide surveys, with a high of 47 counted between Point Montara and Point Ano Nuevo during the spring 1999 survey. Fewer individuals were counted in this area in the spring of 2000, but the exact number was not available at the time this document was completed (Hatfield email 2000). By 1995, southern sea otters were commonly observed as far south as Point Arguello at Vandenberg Air Force Base in Santa Barbara County. Based on observations of tagged individuals, at least some of the southern sea otters at Purisima Point, which is north of Point Arguello, had moved into this area after being translocated to San Nicolas Island.

As mentioned previously, about 100 southern sea otters moved south of Point Conception in the spring of 1998. The number of southern sea otters in the area decreased greatly during the summer. However, by January 1999, the number had increased to 152. On October 13, 1999, one dependent and three adult southern sea otters were observed at San Miguel Island during an aerial survey of the northwestern portion of the management zone; an additional southern sea otter was found along the mainland. These were the only individuals detected in the management zone (Service 2000). As of February 2000, we were unaware of any southern sea otters along the mainland coast south of Point Conception (Sanders pers. comm. 2000). In April 2000, 29 southern sea otters were found during a survey conducted by boat in the area from Cojo Anchorage to Point Conception (Sanders pers. comm. 2000). On May 15, 2000, the CDFG detected 78 southern sea otters in the management zone during aerial surveys, roughly between Point Conception and Refugio State Beach (Harris email 2000)

Twenty-one independent southern sea otters were detected at the island during the most recent survey counted; two pups were also observed (Sanders pers. comm. 2000). Counts have occurred every 2 or 3 months at the island for a number of years and data from these counts indicate the population has not changed substantially since July 1990, ranging from a low of 6 animals to a high of 21. The last three counts, in August and October 1999 and April 2000, yielded the highest number of southern sea otters since 1990. The lack of growth of the colony has been primarily attributed to poor post-weaning survival (that is, pups that reach adulthood) (Service 1995b).

The BRD has analyzed the number of carcasses found to determine whether relative mortality patterns varied during periods of population increase and decline. BRD found that mortality was roughly constant at 5 percent per year during periods of population increase but was "somewhat" higher during periods of decline. This information indicates that mortality increased during the periods of decline (i.e., the early 1980s and 1995 to 1999). Prior to 1980, data from southern sea otters found stranded on beaches was not being analyzed.

Between 1968 and 1989, the cause of death could not be determined for 56 percent of the 1,680 southern sea otter carcasses examined. Between 1982 and 1985, 29 southern sea otters were known to have drowned in gill and trammel nets; however, because only a small portion of the nets were sampled, the actual number of individuals that drowned was likely larger. Eleven southern sea otters (0.7 percent of 1,680 carcasses) are known to have drowned as a result of being tangled in fishing lines. The number of southern sea otters that die from drowning after being entangled in fishing gear is likely to be higher than we can demonstrate. Drowning is nearly impossible to detect in necropsies; all or nearly all of the carcasses for which drowning was attributed as the cause of death were either taken from nets or had net fragments attached to them. Shooting was known or suspected to be the mortality factor in 77 of 1,680 carcasses (4.6 percent) during this time period. Great white sharks, killer whales, and bald eagles are known to kill sea otters. In California, among these species, only great white sharks are known, from evidence of bite marks and scrapings on bones, to attack southern sea otters. Between 1968 and 1989, 195 of 1,680 deaths (11.6 percent) of southern sea otters were likely due to shark attacks.

The potential also exists that southern sea otters are being killed in fish traps and in gill and trammel nets. The live finfish trap fishery expanded in central California during the mid-1990s; in 1999, the trap fishing effort in the southern half of the range of the southern sea otters decreased, possibly as a result of new regulations enacted by the CDFG (Hatfield and Estes 2000). Experiments conducted at the Monterey Bay Aquarium demonstrated that southern sea otters will enter fish traps and can become trapped in them (Hatfield and Estes 2000). However, the only reports of mortality of southern sea otters in fish traps are unconfirmed.

Forney *et al.* (in press) estimated that set gillnets in the Monterey Bay area killed between 17 and 125 southern sea otters from 1995 through 1998. Forney *et al.* attribute the elevated mortality estimates to the increased use of set gillnets in the Monterey Bay area and the documented use of deeper waters by southern sea otters during the late 1990s. Although no take of southern sea otters resulting from entanglement of otters in set gillnets was documented during the period from 1995 through 1998, no monitoring of potential sea otter/gillnet entanglement was undertaken during this period. Forney *et al.* notes that the highest estimate of 125 individuals taken is likely an overestimate because the maximum number of nets that can be set per day are usually not used. Since April 1999, one southern sea otter is known to have died in set gillnets in Monterey Bay (National Marine Fisheries Service [NMFS] 1999).

In 1998, three dead southern sea otters were found with wounds that were caused by the propellers of boats; one additional individual had wounds that may have been caused by a propeller. Three of these individuals were found in the vicinity of Elkhorn Slough in Monterey County and the other was near Morro Strand in San Luis Obispo County. No such wounds were observed in 1999. We have no additional information to indicate whether mortality from collisions with boats is a substantial cause of mortality.

Riedman and Estes (1990) also discuss the factors that may affect the size of the population of the southern sea otter. Because emigration from the parent range seems to be low and annual recruitment appears to be similar to that of populations in Alaska, they conclude that mortality resulting from density-independent or density-dependent factors has caused the slower growth

rate of the southern sea otter. Estes *et al.* (1986 in Riedman and Estes 1990) believed that starvation, which is a density-dependent factor, was not an issue in California because the amount of time that southern sea otters spent foraging was equivalent to that observed in below-equilibrium densities elsewhere, unoccupied habitat occurred at both ends of the range, and the mortality caused by set-nets was estimated at 7 or 8 percent of the total population each year (Wendall *et al.* 1985 in Riedman and Estes 1990). Ralls and Siniff (1988 in Riedman and Estes 1990) disagreed with this conclusion because they observed that "juvenile females in the central part of the range spent more time foraging and experienced higher mortality than other age and sex classes," with the exception of adult males, which experienced the lowest rates of survival. Riedman and Estes (1990) speculated that density-independent factors may be more important at the northern and southern limits of the range where entanglement in set-nets, shark attacks, and shooting are more common than in the central portion of the range.

General Ecology

Unless otherwise noted, the following information on the ecology of the southern sea otter is from Riedman and Estes (1990).

The sea otter is the second largest member of the family Mustelidae; however, the only marine mammal which is smaller is the South American marine otter (*Lutra felina*). Southern sea otters can weigh up to 40 kilograms and attain lengths of 140 centimeters. Males are larger than females. Southern sea otters are estimated to live a minimum of 11 years; one female was known to be 15 or 16 years old.

Unlike most other marine mammals, sea otters have little subcutaneous fat; they depend on their clean, dense, water-resistant fur for insulation against the cold. Sea otters also maintain a high level of internal heat production to compensate for the lack of blubber. Consequently, their energetic requirements are high and they are estimated to consume an amount of food equivalent to 23 to 33 percent of their body weight per day. Contamination of the fur by oily substances can destroy the insulating properties of the fur and lead to hypothermia and death. The loss of the insulating properties of the fur greatly heightens the adverse effects of an oil spill on southern sea otters and is one of the reasons that increased tanker traffic and the potential for oil spills was considered in the listing of the taxon.

Most southern sea otters remain within 2 kilometers of shore. The density of southern sea otters within most of the population's range is most likely related to substrate type; rocky bottom habitats support an average density of five individuals per square kilometer; areas with sandy bottoms support an average of 0.8 individual per square kilometer.

Southern sea otters generally forage in both rocky and soft-sediment communities in water depths of 25 meters or less, although individuals occasionally will move into deeper water. Rocky habitats that are topographically heterogeneous and support kelp forests are likely to support the greatest diversity and abundance of sea otter food resources, which include abalone, rock crabs, sea urchins, kelp crabs, clams, turban snails, mussels, octopus, barnacles, scallops, sea stars, and chitons.

Because of their ability to eat large quantities of marine invertebrates, sea otters play an extremely important role in the nearshore marine community. Their mobility, forelimb dexterity, and ability to crush large invertebrates, either with their teeth or rocks, enable sea otters to prey on virtually any invertebrate of any size. The only refuges for invertebrates from predation by sea otters appear to be in deep holes and crevices in rocky areas or very deep water. The energetic inefficiency of consuming small prey items may also protect invertebrates of small size. Shallow water may also provide refuge to invertebrates; southern sea otters failed to find an "unusually dense concentration of Pismo clams [that occupied a very narrow band of habitat in the high intertidal (zone)] ... for several years" (CDFG 1999, comment 48 on the draft biological opinion).

Numerous reports exist of sea urchin, crab, and clam populations declining once sea otters enter an area. Generally, only more widely scattered, well-hidden, and smaller individuals remain after sea otters become established. Other studies have shown that populations of invertebrates begin to recover once sea otters have left a site.

The available information suggests that sea otters greatly influence invertebrate communities. They require large amounts of food and their mobility, crushing dentition, use of tools, and their highly developed sensory and motor functions combine to make sea otters efficient predators (Riedman and Estes 1990). Although other factors are also likely to be involved, kelp forests appear to grow profusely in suitable areas where sea otters reduce the number and size of sea urchins. In turn, kelp forests provide shelter and food for various species of fish, which become established in areas where kelp forests regenerate. In the western Pacific Ocean and Alaska, fish which have increased in abundance in response to the growth of kelp forests have become an important part of the sea otter's diet. Other predators of sea urchins, such as fish and starfish, and stochastic events, such as severe storms, may also influence the community dynamics of kelp forests. Fish are not an important component of the southern sea otter's diet in California.

The patterns in which southern sea otters move throughout the year are complicated and vary between males and females. Generally, the home ranges of southern sea otters consist of several heavily used areas with travel corridors between them. Animals often remain in an area for a long period of time and then suddenly move long distances; these movements can occur at any time of the year.

Male southern sea otters have larger home ranges than females. Compared to males, most female southern sea otters are more sedentary. Occasionally, females travel long distances; 3 tagged adult females routinely moved between Monterey and Santa Cruz, a distance of 40 to 50 kilometers, for over 4 years. Juvenile males move further from natal groups than juvenile females; aggressive behavior exhibited towards the juvenile males by older males may be partially responsible for their more extensive travels. Most male southern sea otters leave the central portion of the range and travel to its southern end during the pupping season, which occurs in the winter and spring (Riedman and Estes 1990).

Several theories have been presented for the differences in movements between the sexes. Males may accrue some social benefit from gathering in male social groups. Widely traveling males

may have greater opportunity to find females; on the other hand, more sedentary females may derive some benefit from expending less energy traveling and being more intimately familiar with localized food resources. Finally, males which move to the periphery of the species' range may benefit from abundant food resources in areas where southern sea otters do not occur year-round. These seasonal trips to the edges of the range may also be attempts to establish new home ranges. Also, increased competition for suitable territories and the reduced number of estrous females may be responsible, at least in part, for the migration of males to the southern end of the range (Riedman and Estes 1990).

Jameson (1998) notes that adult male sea otters are territorial; they exclude juvenile and subordinate males but females move freely among territories. Generally, southern sea otters occupy territories on a seasonal basis. During the winter and spring, males leave their territories and join male groups that also include juvenile and subordinate males. Maintaining territories during the winter and spring may not be profitable for male southern sea otters because of the reduced chance of encountering estrous females. Additionally, winter storms may reduce the availability of resting sites in kelp; males could then seek shelter in other areas with females or move to new areas, such as at the edges of the range, where food resources may not be as limiting. Additionally, the early results of research with sea otters in Washington shows that testosterone levels in territorial males are three to four times higher than in non-territorial males. Consequently, the absence of females and the presence of greater food resources at the southern edge of the southern sea otter range may seasonally reduce intra-specific stress. This pattern of movement may not be universal throughout the southern sea otter's range. Some territorial males near Monterey appear to maintain their territories year-round (Riedman and Estes 1990). This may be due to environmental differences between the study areas.

Health of the Population

The BRD concludes that the incidence of infectious disease may have been high throughout this century and that disease could be the responsible agent for the southern sea otter's relatively slow rate of population growth. The BRD has found that the rate of infectious disease has not increased since 1992, except for the incidence of acanthocephalan parasites (BRD 1998). However, the general rate of infection seems to be greater than would be expected in a wild population (Thomas and Cole 1996) and it may account for the slower growth rate of the southern sea otter population in relation to populations elsewhere. Thomas and Cole (1996) found that the larvae of acanthocephalan parasites (*Polymorphus* spp.) were aberrantly migrating through the intestinal wall, allowing bacteria to enter the abdominal cavity, and causing peritonitis. This condition was diagnosed in 27 carcasses examined by the National Wildlife Health Center between 1992 and 1996; most of the cases occurred in pups or juveniles. They concluded that the frequency of infections and of migration by these parasites from the intestine had increased over the 5-year period of the study.

The southern sea otter does not appear to be a suitable host because no egg-bearing individuals of the parasite, *Polymorphus* spp., have been found. Sea birds, including gulls, scoters, and sea ducks, prey on crabs which contain the parasites; eggs are passed from the birds to the ocean via feces. Southern sea otters may become infected by eating the crabs or possibly directly through

contact with eggs in sea water. The increased prevalence of the parasites could be related to increased numbers or changes in distribution of sea birds; changes in behavior of southern sea otters could also increase exposure to the parasite. The increased migration of larvae of *Polymorphus* spp. from intestinal tracts could be related to decreased resistance to disease of the southern sea otters that are infected. Another potential explanation is that the ongoing range expansion of the of the southern sea otter has brought a higher proportion of the population into proximity of sandy bottom habitats where the definitive host of *Polymorphus* lives.

Seventeen of the southern sea otters examined by Thomas and Cole (1996) likely died from protozoal encephalitis caused by *Toxoplasma gondii*. Most of these individuals were adults or subadults. The typical infectious stage of the protozoan is usually found in cat feces. In humans, infections usually occur in very young or old individuals or in those with impaired immune capabilities. Prior to this study, this disease had not been observed in southern sea otters. The mechanism by which *Toxoplasma gondii* is transmitted to the southern sea otter is unknown but the protozoan may be entering the ocean in runoff from beach soils or sewage effluent.

Thomas and Cole (1996) also reported eight cases of coccidioidomycosis, which is caused by the fungus *Coccidioides immitis*. All of the affected individuals were adults or subadults. In all cases, multiple organs were affected by the disease, which is also called Valley fever. The method by which this disease was transmitted to southern sea otters is unknown.

Various bacterial infections were responsible for the deaths of an additional 23 southern sea otters examined by Thomas and Cole (1996). All of the affected individuals were adults or subadults. The causes of the infections were likely inhalation or trauma, but direct transmission between individuals would be unlikely.

Recent analysis of water quality in southern California indicates that viruses are entering the marine environment through runoff from urbanized areas (Cone 1999). We are unaware of any incidence of such viruses affecting the health of southern sea otters. However, because human swimmers have become sick after swimming in contaminated water and the level of urbanization is generally increasing in portions of the range of the southern sea otter, the potential exists for viruses to affect this taxon.

An examination of the environmental baseline for the southern sea otter must also consider the potential effects of environmental contaminants on the status of the species. Sources of potential environmental contaminants may be natural or anthropogenic. California's Coast Range contains abundant geologic sources of mercury and has a long history of mercury mining and associated contamination. This natural source of mercury and any increased availability of mercury associated with mining occur in the headwaters of streams that discharge into the range of the southern sea otter.

Riedman and Estes (1990) conducted a review of the presence of contaminants in the environment and their effects on sea otters; they note that adverse effects of environmental contaminants had not been documented although various types of materials occur in tissue samples taken from sea otters. Riedman and Estes (1990) note that some workers found seasonal

variation in the levels of pesticide residues; residues were lowest in southern sea otters that died between May and August and highest in animals dying between January and April. The least and greatest amounts, respectively, of runoff from agricultural fields occurs during these periods. Another general trend is that the amount of cadmium, copper, iron, mercury, and zinc residues in the liver or kidneys increased with the size of the southern sea otter; conversely, magnesium and silver residues in the liver were lower in southern sea otters under 100 centimeters in length. Different methods of analysis may have contributed to at least some of these differences.

Southern sea otters consume as much as 35 percent of their body weight per day. This high forage rate leaves them potentially vulnerable to contaminant loading through the intake of food. Because they forage close to the coast and, consequently, to elevated discharges of mercury from the Coast Range, the southern sea otter is at risk of dietary exposure to this metal. Additionally, southern sea otters obtain a portion of their water needs from sea water. They may also ingest inorganic mercury in this manner.

Elkhorn Slough, which receives runoff from local farmlands and a portion of the Coast Range and then flows into Monterey Bay, contains elevated levels of mercury (Service and NMFS 1998). Livers collected from southern sea otters found dead at this location had a maximum mercury concentration of 60 milligrams per kilogram [mg/kg]) (Mark Stephenson, pers. comm., 1998). Wren (1986) suggested that the normal mercury concentration in river otter (*Lutra canadensis*) livers was four mg/kg. Forty-five percent of 125 southern sea otter livers examined for mercury had concentrations greater than what may be the ambient concentration for river otters (Service and NMFS 1998). Other coastal drainages, such as San Simeon Creek, also contain elevated levels of mercury, most likely as a result of historic mercury mining. The extent to which mercury has contaminated the offshore environment is not known.

Acute mercury poisoning in mammals is primarily manifested in damage to the central nervous system, sensory and motor deficits, and behavioral impairment. Animals initially become anorexic and lethargic. Smaller carnivores are more sensitive to toxicity from methyl mercury, the organic form in which mercury can be found, than larger species as reflected in shorter times of onset of toxic signs and time to death. To date, information on the levels of mercury or methyl mercury to which southern sea otters are exposed is unavailable. Additionally, the ability of southern sea otters to detoxify methyl mercury is not known, but it could protect individuals from the adverse effects of increased methyl mercury loads. The CDFG and Service are currently undertaking a risk assessment to determine the level of effect that mercury and other contaminants may be having on the southern sea otter.

Although specific research has not been conducted on the southern sea otter, other species within the mustelid family, such as the mink (*Mustela vison*) and ferret (*M. putorius furo*), are extremely sensitive to several types of organochlorines (Bacon *et al.* 1999) Minks exhibited complete reproductive failure when exposed to polychlorinated biphenyl (PCB) levels as low as 0.64 part per million (ppm) in their food. This exposure caused PCB levels in the livers to reach 1.2 ppm; southern sea otters have been found with liver PCB levels greater than 1.2 ppm. Decreased birth rates, growth rates, and survival of kits were among the symptoms that minks developed when

exposed to PCBs. This information may suggest a connection between the levels of PCBs found in southern sea otters and their high rate of pre-weaning mortality (Jarman *et al.* 1996).

PCBs and dichlorodiphenyltrichloroethane (DDT) have been shown to suppress immune potential in fish and mammals. The levels of DDT found in southern sea otters do not seem to be toxicologically significant (Bacon *et al.* 1999). Levels of other individual organochlorine pesticides were also reported by Bacon *et al.* to be low in the southern sea otter. In general, organochlorine levels have decreased substantially in the California coastal ecosystem over the past several decades. For example, PCB levels in California sea lions (*Zalophus californianus*) in central and southern California have declined by well over an order of magnitude (Lieberg-Clark *et al.* 1995) during this period.

Tributyltin and its degradation products (BTs) have been found in tissues of dead southern sea otters (Kannan *et al.* 1998). This material was used extensively as an antifouling agent in marine paints. Many countries introduced regulations on the use of these materials in the 1980s. However, BTs continue to be found in areas frequented by large vessels; these chemicals also persist in the environment for several years. Only large vessels are currently allowed to use paints containing tributyltin. Kannan (*et al.* 1998) notes that large harbors, such as at Monterey which are used by ships painted with tributyltin, continue to exhibit "ecotoxicologically significant butyltin contamination."

BTs products have been shown to suppress immune potential in fish and mammals. Consequently, these animals become more susceptible to microbial infections. Kannan *et al.* (1998) demonstrated that southern sea otters dying from infectious diseases contained greater concentrations of BTs than animals that died as a result of trauma.

The synergistic effects of these chemicals, even those found at concentrations sufficiently low that they would not alone cause concern, and parasites must also be considered. In addition to the previously mentioned study by Kannan *et al.* (1998), Nakata *et al.* (1998) report that southern sea otters that died from infectious diseases and other causes, such as neoplasia, emaciation, and esophageal impaction, contained greater concentrations of PCBs and DDTs. Although absolute correlations among various pollutants and diseases and mortality have not been developed, the widespread presence of a variety of contaminants in southern sea otters and the increasing prevalence of infectious disease warrant further examination and consideration in evaluating the status of the taxon.

Southern sea otters have not experienced any substantial adverse effects from oil spills over the last several years. Currently, 19 oil production platforms are located in the Santa Barbara Channel and the Santa Maria Basin. The Minerals Management Service is currently evaluating additional exploration for crude oil in these areas. As a result of various activities associated with exploration for and development of crude oil resources, six or seven exploration wells may be drilled from existing platforms or a single mobile drilling unit, approximately 10 production wells may be drilled from existing platforms, four to six new platforms may be constructed on the outer continental shelf, and six to eight existing platforms on the outer continental shelf may be decommissioned (Minerals Management Service 2000, Service 2000). Any oil that is

produced as a result of this exploration would be moved to shore by pipelines; one new pipeline may need to be constructed (M. Pierson pers. comm. 2000). In general, pipelines pose less risk of oil spills than do tankers.

Reproduction

Southern sea otters mate and pup throughout the year. The northern and southern portions of the population seem to exhibit different mating peaks. A peak period of pupping occurs from January to March; a secondary pupping season occurs in late summer and early fall. Pupping is seasonally uniform in the Monterey Bay area (Riedman *et al.* 1994). Parental care is provided solely by the female.

Southern sea otters have successfully reproduced at San Nicolas Island from the beginning of the translocation program. As of April 2000, 56 pups are known to have been born at the island. Seven pups were observed with their mothers for fewer than 120 days and probably did not survive to weaning. Fifteen pups are known to have been with their mothers for a long enough period to likely survive to weaning, while the fate of the remaining 34 is unknown (Hatfield email 2000). Predation of young southern sea otters is not known to be a factor; however, great white sharks do occur in the area. Incidental take by trap fisheries is another possibility. Large numbers of fish traps have been set around San Nicolas each season, but no documented deaths of southern sea otters can be attributed to these fisheries at San Nicolas Island to date. Southern sea otters are known to enter such traps in captivity; an effort to monitor traps in the field was attempted but observers had difficulty in finding fishing vessels, possibly as a result of the decreased fishing activity (Estes 1999, Hatfield and Estes 2000).

Conservation Needs of the Species

The initial recovery plan for the southern sea otter was approved in 1982. In 1989, the Service formed another recovery team for the southern sea otter to revise the 1982 recovery plan. Draft recovery plans were developed and circulated for public comment in 1992 and 1995. A revised draft recovery plan was circulated for public comment in January 2000 (Service 2000).

The draft recovery plan (Service 1995a) identified two objectives that needed to be met to delist the southern sea otter. First, the range of the southern sea otter and the number of individuals would need to increase to reduce the risk of a single catastrophic event reducing the population to below a level that is viable. Second, the risk to southern sea otters that an oil spill would occur within their range should be decreased.

With regard to the latter goal, the Monterey Bay National Marine Sanctuary and U.S. Coast Guard, with the assistance of a stakeholder task force, drafted a proposal to establish a vessel routing system along the central California coast. This system proposes that different types of vessels, such as oil tankers, dry cargo vessels, and barges, would be assigned to specifically designated lanes based on the potential risk of oil spills contacting the shore should an accident occur and the emergency response time that would be necessary to provide assistance to a disabled vessel. If approved by Congress, this traffic routing system would reduce the risk of vessel

collision and grounding and reduce the potential oil spill risk to southern sea otters. This proposal remains pending.

The 1995 draft recovery plan identified three actions that needed to be conducted to achieve recovery of the southern sea otter population. First, the population and habitat of the southern sea otter should be monitored to determine the number of individuals, the rate of growth, and range expansion. Second, the population should be protected and the potential limiting factors related to human activities, such as those associated with oil production and transport and possible oil spills, should be reduced or eliminated. Finally, research into the factors currently limiting the growth rate of the southern sea otter population should be conducted to refine recovery goals for future management.

The draft recovery plan acknowledged that the translocation program had not met its objectives. It further noted that, although the colony at San Nicolas Island may eventually increase in size, its long-term survival is questionable. Finally, it recommended against additional translocations and stated that recovery of the southern sea otter would occur more rapidly if the existing population is allowed to expand its range and population size.

A primary goal of the translocation was to establish a colony of southern sea otters sufficiently far from the mainland that the potential of a human or natural catastrophe affecting the entire population would be reduced. A specific concern was the risk of oil spills. Current modeling of oil spills along the central coast of California indicates that a large spill could, in fact, affect both the mainland coast and San Nicolas Island. Experience with the *Exxon Valdez* has shown that measures to contain the spill and rehabilitate sea otters are likely to be ineffective in protecting the population. Additionally, information gained from the *Exxon Valdez* spill indicates that mortality of sea otters could continue to occur for a long period of time after the spill. Both of these factors decrease the importance of a second colony of southern sea otters at San Nicolas Island when a mitigating measure for the existence of that colony is maintenance of the management zone. The recovery team concluded that the most appropriate measure to protect southern sea otters from a catastrophic event would be a large number of individuals over a large area of suitable habitat.

In the most recent draft of the recovery plan (Service 2000), the recovery team states that coastal vessel traffic should be regulated or managed in a way that will minimize the risk of accidents in and near the range of the southern sea otter. The recovery team also states that the population of the southern sea otter must increase in number and range. Specifically, the draft recovery plan recommends evaluating the causes of mortality, developing and implementing a plan to reduce the probability of an oil spill, developing and implementing plans to reduce or eliminate the take of southern sea otters, and evaluating the assumptions used to estimate the population level at which the taxon would be considered to be recovered. This most recent draft recovery plan notes that the translocation program has not been as successful as was desired and that cessation of the containment program is considered the primary action for promoting the recovery of the southern sea otter.

At the time the translocation program was planned, the Service assumed that sufficient habitat existed north of Point Conception to allow southern sea otters to reach the population levels

indicated in the recovery plan; continued expansion to the north of the existing range was also a reasonable assumption. Considering the rates of growth in populations and numbers of individuals of sea otters elsewhere, the Service's predictions and expectations regarding the growth rate and size of the southern sea otter population were not unrealistic. However, for reasons that have yet to be fully determined, the growth of the parent population has not met expectations and is currently in decline, and expansion to the north has generally been slower than to the south. Twenty southern sea otters moved north of Point Ano Nuevo in the spring of 1998; these animals were observed in small groups or scattered individuals. Prior to this event, expansion to the north had almost ceased completely. In the spring of 1999, 47 southern sea otters were observed north of Point Ano Nuevo.

The southern sea otter had been expanding its range southward since before the onset of the translocation program. The Service had predicted that the parent range of the southern sea otter would reach the management zone by approximately 2001 to 2006, although the CDFG had predicted a more rapid movement. The annual exploration by male southern sea otters was likely to keep expanding the boundaries of the range as these individuals explored new areas. As the level of protection afforded the population increased (i.e., initial protection from hunting and later from various types of nets), most biologists expected the southern sea otter to expand its range both north and south. The slower movement to the north is less explainable than the expansion to the south. We are unsure why the northern expansion slowed around Point Ano Nuevo for a period of time because resources to the north of this area do not appear to be substantially different than those to the south.

The southern movements that occurred in the last 2 years are a continuation of the range expansion of the southern sea otter. As the range of the southern sea otter becomes larger, the likelihood that a single stochastic event could cause irreparable damage to the population decreases. Because of the generally slower movement of southern sea otters to the north, their ability to expand the range to the south increases in importance.

Additionally, the larger range may allow southern sea otters to exploit food resources within the range more sporadically. That is, invasions by southern sea otters and subsequent declines in prey base could be followed by decreased presence of southern sea otters and recovery of the food resources over greater areas.

Finally, many of the documents concerning the translocation program, the experimental population, and the donor population discuss the potential carrying capacity of habitats; models estimate the number of southern sea otters that can inhabit a given area based on its biotic and abiotic characteristics. The numbers provided by such models are estimates, based on our understanding of the natural factors that affect the abundance of southern sea otters. Our understanding of these factors is incomplete, but we are aware that the factors change over time (e.g., El Niño events and changes in predator-prey balances). The impact of human activities, including harvesting of ocean resources and pollution, also affects carrying capacity in ways that are not well understood.

Because human activities affect the carrying capacity of the southern sea otter's habitat, whether its carrying capacity has been reached, as several commenters on the draft biological opinion contend, is irrelevant. The estimates of the numbers of southern sea otters that are necessary to achieve recovery cited in the recovery plan are intended to maintain a sufficient population to ensure protection from genetic bottlenecks and natural fluctuations in habitat quality. Simply stated, the conservation needs of the southern sea otter are likely greater than the quality and quantity of habitat currently provided within the parent range; human activities are likely to be at least partially responsible for this situation.

Summary

The population of southern sea otters has declined over the last 4 or 5 years. The reason or reasons for the decline cannot be fully explained to date. The incidence of infection by acanthocephalan parasites appears to be increasing and southern sea otters are contaminated with potentially harmful levels of environmental contaminants. Both of these factors are likely indirectly associated with the growth of human populations along the range of the southern sea otter. Changes in the location of set-nets, particularly in the area around Monterey Bay, could be causing greater mortality of southern sea otters than was previously thought; a coastal pot fishery for live fish traps has rapidly developed along the central coast since the mid-1990s and southern sea otters are known to become entrapped in fishing gear. The carrying capacity of the marine environment upon which the southern sea otter depends may be changing, as a result of natural or human-induced processes or a combination of both. For example, the recent El Niño event may have affected the number of southern sea otters. All of these factors, either individually or synergistically, may play some role in the decline of the sea otter population.

In conclusion, the overall condition of the southern sea otter is one of decline and instability. One positive aspect of the population's overall ecological condition appears to be the subspecies' continued expansion into the southern portion of its former range. The best available information indicates that continued, passive expansion of the range of the southern sea otter is necessary for its survival and recovery.

EFFECTS OF THE ACTION

Maintenance of the existing management zone south of Point Conception will have both direct and indirect adverse effects on the survival and recovery of the southern sea otter. Direct effects involve the fates of the individual animals that would be captured and moved; the indirect effects are related to the artificial restriction of the range of the taxon and the impacts that the southern sea otters released into the parent population would have on the resident animals.

The capture of large numbers of southern sea otters in the management zone and their transport and release into the parent population may result in the deaths of individual animals. To date, 12 southern sea otters are confirmed to have died as a result of being captured, held, and transported during containment and translocation activities. A brief summary of the mortalities is contained in the "Previous Reviews of the Translocation Program" section of this biological opinion. Improvements in the techniques used during capture and removal of southern sea otters may assist

in reducing the number of deaths; also, the additional procedures involved with translocating animals to San Nicolas Island, such as implanting radio transmitters in some individuals, may have caused a higher level of mortality than that associated with management zone activities. However, at this time, the Service does not possess any new information on capturing and moving animals that is likely to result in a lowered mortality rate. One factor that was intended to reduce mortality during translocation activities was that southern sea otters being considered for translocation to San Nicolas Island were screened carefully to try to ensure they were physically able to withstand the stress, and only the individuals that were considered suitable were selected. During a containment program, all individuals would be captured and moved, without regard to their health.

As noted previously in this biological opinion, approximately 73 southern sea otters moved to San Nicolas Island subsequently could not be found; their fates are not known. The Service is also unable to determine the fates of many of the southern sea otters captured as part of the containment effort. The potential exists that a large percentage of these animals perished as a result of being captured and moved. If that is the case, the direct adverse effects of capturing and moving animals would be severe. The loss of any animals would accelerate the recent decline in the population. If the loss involved a percentage as high as that for which the fates are undetermined, the decline of the population would be greatly accelerated. Given that southern sea otters may continue to move into the management zone in the future, the adverse effects of losses from containment, considered over a longer time frame, would likely have substantial consequences for the survival and recovery of the subspecies. Also, because southern sea otters have a strong tendency to return to their point of capture, the potential exists that the same individuals may need to be captured and moved more than once; this repeated handling would increase the likelihood of mortalities.

Continuation of the containment program will also restrict the natural range expansion of the southern sea otter. Restriction of the southern sea otter's range increases the likelihood that oil spills and stochastic events would affect a greater percentage of the individuals in the population. The existence of the management zone precludes the ability of the southern sea otter to expand its range to the south and thereby reduce these risks. The recovery team for the southern sea otter notes that the "primary action for promoting the recovery of this population at this time is the cessation of the 'otter-free-management zone' in the southern California Bight. Without such a change in management, the current population decline could worsen" (Service 2000).

The following information on sea otter territoriality and social behavior is from Garshelis *et al.* (1984.) unless otherwise noted and provides background regarding the importance of the sea otter's social system. In Alaska, territorial male sea otters patrol their territories in a highly visible manner and usually repulse trespassing individuals without actual contact or after a brief fight. Maintaining an appropriate territory is likely important for males because it may increase the likelihood of successfully mating. Females may be attracted to territories if food resources are particularly good. Another important factor in the attractiveness of territories to sea otters, at least in Alaska, is the presence of sheltered resting areas; sea otters expend less energy in sheltered sites. Male sea otters used the same or nearly the same territories during successive breeding seasons. Interestingly, sea otters do not universally defend territories; territorial defense was not

observed in sea otters in the Aleutian Chain in Alaska, but territoriality does occur in California's southern sea otters (Kenyon and Vandevere, respectively, in Caulkins and Lent 1975).

Garshelis *et al.* speculate that the long-distance movements from territories to areas at the edges of the range may be prompted by the greater abundance of food in these areas and further theorize that such movements may be common in all expanding populations of sea otters. These individuals may be attempting to determine whether new sites would be appropriate as breeding territories. The diminished food resources within an area where dominant males have secured territories may prompt non-territorial males to start long-distance movements.

The separation of most males from females during portions of the year are likely to benefit females. Garshelis *et al.* found that females attempting to feed are frequently interrupted by sexual interactions with males. Food stealing by males is also common. Females with pups generally avoided male groups; interactions with males resulted in the temporary separation of the pup and female which places the pup at risk. Jameson (1989) also reports that the seasonality of adult male southern sea otters, in areas where females maintain territories (females areas), is apparently related to the reproductive status of females in the population. More males were in the female areas when the maximum number of females were in estrous; males left the female areas and traveled to the ends of the range when they derived no benefit, in the form of reproductive opportunities, from being in the female areas. Additionally, the density of males is lowest in the female areas when the number of pups is the highest. This separation likely reduces negative interactions between males and female-pup pairs.

The movements of male southern sea otters are also related to kelp canopies (Jameson 1989). If kelp canopies are reduced by winter storms, males may lose their traditional resting sites. These males could remain in their normal territories where, without kelp, they would expend more energy while trying to rest. They could also move into more protected areas with females and pups, where they may encounter more limited food resources and increase the potential for agnostic encounters with other males at a time when estrous females are not common. Alternatively, males could move to another area where they reside in close proximity without exhibiting the territorial behavior that is manifested when estrous females are present.

Moving large numbers of males into the parent range, as would be required if the recent movement of large numbers of male southern sea otters into the management zone continued, is likely to disrupt the social structure of the parent population and reduce the survival and reproductive success of affected individuals. If animals from the south are moved back into the central portion of the range, the seasonal separation of females and most males would be disturbed. Various disruptions of the social system are also likely to occur as a result of the released males passing through the territories of female-pup pairs and resident males. Increased aggressive behavior is likely between the released males and territorial males; the increased aggression is likely to result in animals expending additional energy to maintain territories.

As noted previously in this biological opinion, a factor in the seasonal movement of male southern sea otters to the south is likely related to availability of food resources. The reintroduction of the

released males into areas that they have left to seek, in part, greater food resources would likely place the released males and the resident animals in nutritional stress.

Jameson (1998) noted that testosterone levels in territorial males are three to four times higher than in non-territorial males. The greater hormonal levels in territorial males are likely to cause them to react aggressively toward southern sea otters from the management zone that are released in the parent range. A greater number of aggressive interactions would result in increased energy expenditures for the territorial males and possibly decrease their ability to maintain territories. Aggressive interactions with numerous territorial males may also increase physiological stresses on dispersing southern sea otters that have been captured in the management zone and released into the parent range.

Releasing additional male southern sea otters into areas when females are caring for pups is likely to have adverse effects on the female-pup pair. As described previously in this biological opinion, males steal food from females, disrupt their feeding, and occasionally cause them to be separated from their pups. The incidences of these behaviors would likely increase when additional males are released into female areas.

The adverse effects of an unnatural influx of male southern sea otters are likely to occur synergistically; that is, released and resident southern sea otters are likely to experience more than one of the circumstances described above. In combination, these effects would have greater impact on each individual than any single impact. An important point to consider is that southern sea otters are driven by their biological needs to separate seasonally; they are also adept at returning to areas from which they are removed. Consequently, the adverse effects described above would not be a one-time occurrence. The same effects would occur each season if the containment program is continued. Given the rapidity with which southern sea otters can travel, the potential exists that the same individuals would likely need to be captured repeatedly during a single season.

Members of the recovery team generally concur with this assessment. A subgroup of the team informed the Service that they believe the movement of large numbers of individuals would likely disrupt the social structure of animals in the parent range and increase the competition for food that may already be limiting that population. Their analysis also stated that the capture and movement of a large number of adult males would likely lead to numerous mortalities because of the sensitivity of this age and sex class to the stress of capture and removal (DeMaster 1998a). The subgroup concluded that these impacts are likely to exacerbate the recent population decline. They stated that euthanizing the individuals in the management zone or removing them to captive facilities would be less harmful to the overall population than moving them back into the parent population.

The direct disruption of the social system could possibly be reduced by moving these males to the extreme northern portion of the range. However, the consequences of locating additional male southern sea otters in the northern group could also result in increased aggressiveness and

pressure on food resources. These individuals would also then re-enter the central portion of the range from the north and potentially cause disruption of the subsequent breeding season. Moving these animals back to a location immediately north of Point Conception would be unlikely to keep them from promptly returning to the management zone. Given the long-range movements and homing behavior exhibited by several southern sea otters during the translocation program, including containment, individuals moved from south of Point Conception are likely to return to that area in a relatively short time. Finally, numerous male southern sea otters moving through the range are likely to disrupt the social structure along the entire length of the area they travel.

Disruption of the social structure and increased competition for food would increase stress among individuals, leaving them increasingly susceptible to disease and the adverse effects of environmental contaminants. Increased stress could also decrease nutritional intake and lead to decreases in the birth rate, poor survivorship of pups, and possibly death from malnutrition. Pups are more likely to be abandoned if their mothers undergo undue stress. Any one of these adverse effects would exacerbate the recent decline of the southern sea otter population; in combination, they may significantly exacerbate the decline.

Transporting individuals from the management zone into the parent range would artificially increase the density of southern sea otters within portions of the parent range. If southern sea otters disperse as a mechanism for surviving variable levels of food resources during portions of the year, this artificial crowding will likely cause at least some individuals to obtain less food than they optimally require. Insufficient nutrition leads to less reproductive success, lowered resistance to disease or parasites, or behavioral problems; in extreme cases, starvation could result.

Some potential exists to reduce the adverse effects of moving southern sea otters from the management zone into the parent range by scattering individuals that are being moved throughout the parent range, rather than releasing them at a single location. Such releases would result in less impact on local food resources and, therefore, less stress on resident southern sea otters than the release of dozens of individuals in one location. Disruptions of the social system would also likely be less because of the smaller number of individuals involved; however, the disruptions that would occur would now be spread throughout the range of the subspecies. The subgroup of the recovery team also addressed this issue and concluded that, given the current status of the taxon, moving even small numbers of southern sea otters would not be advisable (DeMaster 1998b).

Recent evidence, as discussed above in the "Status of the Species" section, indicates that infection by acanthocephalan parasites may be becoming more prevalent in southern sea otters and that some environmental contaminants may be compromising the health of the parent population. If southern sea otters are allowed to expand their range into areas they find suitable, they may encounter habitat where environmental contaminants pose less risk. Additionally, allowing the southern sea otter to continue to expand its range may result in a redistribution of the population in a manner that assists in reducing the incidence of disease. The Service also recognizes, however, that range expansion to the south may eventually pose additional difficulties for the southern sea otter. The heavily urbanized and industrialized areas of Ventura, Los Angeles, Orange and San Diego counties are likely to present obstacles to range expansion, such as

depleted food resources, increased human activity, and decreased water quality, particularly as a result of pesticide residues.

The greater number of southern sea otters counted during the spring 2000 surveys does not alter the conclusions of our analysis. As we have noted previously, an increase in numbers during one survey does not provide sufficient data for the Service to conclude the recent population trend has been reversed. Additionally, if the number of individuals has increased, the capture and transfer of even larger numbers of southern sea otters into that increasing population would result in the same manner of impacts to the social structure outlined above. The potential exists that a containment effort while the population was increasing could have substantially greater adverse effects because more southern sea otters would likely be present, both in the management zone and in the parent range, and the adverse effects of capturing and moving these animals would be magnified. Finally, if southern sea otters are moving south of Point Conception because the carrying capacity of the habitat in the parent range has been reached, as some contend, the introduction of more animals into an area that may no longer be able to support them would exacerbate competition for food and aggressive interactions.

Our analysis indicates that the capture of large numbers of southern sea otters in the management zone and their release into the parent range would likely have substantial adverse effects on the ability of this subspecies to survive and recover. We are unable to define the exact number of southern sea otters that could be moved from the management zone into the parent range before such substantial adverse effects are likely to occur. However, given that the goal of the containment program is to remove all southern sea otters from the management zone and southern sea otters are moving into the area south of Point Conception in large numbers, we have focused our analysis on the effects of a large-scale removal effort. If southern sea otters ceased moving into the management zone in large numbers, the Service would consider that information in its evaluation of the entire program, including the development of a subsequent biological opinion.

CUMULATIVE EFFECTS

Cumulative effects include the effects of future State, tribal, local or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the ESA.

Several of the factors that could be considered cumulative effects, such as environmental contamination and disease, have been discussed previously in this biological opinion. The CDFG may be considering a closure of certain fisheries around the northern Channel Islands, which are generally south and east of Point Conception; if implemented, the closure could change the resource base and provide for additional forage for southern sea otters. The Service is unaware of other non-federal activities within the range of the southern sea otter which could cause substantial adverse effects to the taxon.

CONCLUSION

After reviewing the current status of the southern sea otter, the environmental baseline for the action area, the effects of the continuation of the containment program, and the cumulative effects, it is the Service's biological opinion that continuing the containment program and restricting the southern sea otter to the area north of Point Conception (which marks the current legal boundary between the parent range and the management zone, with the exception of the translocation zone at San Nicolas Island) is likely to jeopardize its continued existence. Critical habitat has not been designated for this species, therefore, none will be affected. This conclusion is based on the following reasons:

1. Reversal of the southern sea otter's population decline is essential to its survival and recovery. Continuation of the containment program will result in the capture, transport, and release of large numbers of southern sea otters from the management zone into the parent population. These actions may result in the direct deaths of individuals and disrupt social behavior in the parent population to the degree that those affected individuals will have reduced potential for survival and reproduction. These effects will exacerbate the recent decline of the southern sea otter population.

2. Expansion of the southern sea otter's distribution is essential to its survival and recovery. Continuation of the containment program will result in the exclusion of southern sea otters from the area south of Point Conception. This effect will perpetuate the species' artificially restricted range and its vulnerability to the adverse effects of oil spills, disease, and stochastic events.

REASONABLE AND PRUDENT ALTERNATIVE

The regulations which implement section 7(a)(2) of the ESA (50 CFR 402.02) define reasonable and prudent alternatives as alternative actions, identified during formal consultation, that: (1) can be implemented in a manner consistent with the intended purpose of the action; (2) can be implemented consistent with the scope of the action agency's legal authority and jurisdiction; (3) are economically and technologically feasible; and (4) would, the Service believes, avoid the likelihood of jeopardizing the continued existence of listed species or resulting in the destruction or adverse modification of critical habitat. In consideration of these criteria, we conclude that, at this time, there are no reasonable and prudent alternatives that would avoid jeopardy to the species while still meeting the intended purpose of the containment program which is to remove southern sea otters from the management zone.

As noted previously in this biological opinion, the Service intends to undertake a comprehensive review of the translocation program under NEPA and evaluate: whether the program, or some of its components, should continue; modifications to the program; and termination of the program. As part of the NEPA process, the Service will identify and evaluate potential alternatives, if any, to the existing containment program that would avoid jeopardy to the species, while still meeting the purposes of containment. The Service may also propose modifications to 50 CFR 17.849(d), the regulations that implement the translocation program authorized under Public Law 96-625.

While we are evaluating the program through the NEPA process, the Service will continue to inform stakeholders and interested members of the public regarding the translocation program and any proposed changes to the program and provide information regarding the ecology of, threats to, and the recovery program for the southern sea otter, both in the management zone and in the parent range. We encourage all interested members of the public and stakeholder groups to participate fully in the review process.

If the final evaluation determines the translocation program to be a failure, the Service could choose either to terminate the translocation program, including its containment component, as allowed under 50 CFR 17.84, subject to compliance with the ESA; promulgate new regulations which propose different strategies (including redefining the management zone), provided they are consistent with the provisions of Public Law 99-625; or seek a change in the underlying statutory provisions. The Service intends to involve stakeholders and interested members of the public fully in exploring alternative strategies to address issues regarding the translocation program, including containment, consistent with the needs of the southern sea otter to survive and recover, the ESA, MMPA and other applicable federal laws.

The Service will also consult with the Marine Mammal Commission, the CDFG, the recovery team, and the technical consultant team. Unless we receive new information on the status of the southern sea otter or on the likely effects of containment or the Service concludes that the containment program can continue in a manner that avoids the likelihood of jeopardy to the southern sea otter, we will not remove any southern sea otters from the management zone during the NEPA review period. At the conclusion of the NEPA process, the Service will determine whether its decision to continue, modify or terminate the translocation program requires re-initiation of formal consultation pursuant to section 7 of the ESA.

INCIDENTAL TAKE STATEMENT

Section 9 of the Act and Federal regulations promulgated pursuant to section 4(d) of the ESA prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harm is further defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. Harass is defined by the Service as intentional or negligent actions that create the likelihood of injury to listed species by annoying it to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the ESA provided that such taking is in compliance with the terms and conditions of this incidental take statement.

Public Law 99-625 provides statutory exemptions from the prohibitions against the take of southern sea otters resulting from the Service's actions to effect translocation and containment. In

addition, the law provides exemptions for certain other activities that may affect southern sea otters in the management zone. Otherwise lawful activities within the management zone are exempted from the prohibitions against take.

Under the scenario envisioned by the Service, southern sea otters would remain in the management zone for at least some time into the future. Incidental take of these individuals in the management zone would not be prohibited by section 9 of the ESA. This lack of section 9 protection would expose these individuals to some risk of mortality and injury incidental to otherwise legal activities.

The Service is unaware of any legal activities currently being conducted within the management zone which pose a certain, high risk to southern sea otters. As mentioned previously, lobster traps have the potential to capture and drown southern sea otters but the Service has not documented any such incidents at San Nicolas Island; one such drowning occurred at Santa Cruz Island. We recognize that some level of mortality or injury may occur as a result of these activities, but we are unable to quantify it. We expect that the level of mortality resulting from lobster traps in the management zone is likely to be less than that experienced by southern sea otters throughout the remainder of the parent range, at least in the immediate future. This expectation is based on the likelihood that food resources may be more abundant at the edge of the range and that the normally higher mortality levels associated with pupping and weaning will not occur in these groups of male southern sea otters.

The intentional killing or injury of southern sea otters within the management zone is not exempted from the prohibitions against take, because it is not an otherwise legal activity. Public Law 99-625 does not provide exemptions for any such activity. However, the potential exists that individuals could be intentionally killed or injured. The Service is unable to determine whether such take will occur or to quantify any level of such take. However, to reduce the likelihood that such take may occur, the Service will evaluate whether the presence of staff, including personnel from the Division of Law Enforcement, is needed in the management zone when southern sea otters are present. If such a presence is needed and subject to the availability of appropriated funds, the Service will provide funding and staffing to protect against illegal take of southern sea otters.

CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the ESA directs Federal agencies to use their authorities to further the purposes of the ESA by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information.

The Service should endeavor to undertake or fund research that is focused on determining why the population of the southern sea otter is in decline. Decisions regarding the future management of this taxon could be made with more certainty if we understood why the southern sea otter population is in decline.

REINITIATION NOTICE

This concludes formal consultation on the continuation of the containment program for the southern sea otter, as directed by Public Law 99-625. As provided in 50 CFR §402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

If you have any questions regarding this biological opinion, please contact Carl Benz of the Ventura Fish and Wildlife Office at (805) 644-1766.

Attachments

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Table 1. Known Mortalities of Southern Sea Otters
associated with the Translocation and Containment Programs

Form of Mortality	First Annual Report	Second Annual Report	Third Annual Report	Fourth Annual Report	Fifth Annual Report	Sixth Annual Report
Died at San Nicolas Island prior to release	3	-	-	-	-	-
Found dead in parent range	-	-	-	-	1	3
Found dead in management zone	2	-	3	1	-	-
Died at Monterey Bay Aquarium	4	1	1	1	-	-
Died after capture for translocation	-	1	-	-	-	-
Died after containment activities	1	-	-	1	-	2

First Annual Report - Both of the dead southern sea otters from the management zone were found in Ventura County (Service 1988). The individual that died after containment was a pup that entered the management zone from the parent range (Sanders pers. comm. 2000).

Second Annual Report - The southern sea otter that died after capture for translocation was captured to be translocated to San Nicolas Island, released at the point of capture, and found dead shortly after (Service 1989).

Third Annual Report - Four individuals were found dead in the management zone, but only three could be confirmed as animals that had been translocated to San Nicolas Island (Service 1990).

Fourth Annual Report - The southern sea otter found dead in the management zone was located at San Miguel Island; this individual had previously been translocated to San Nicolas Island. The individual that died after being captured on the mainland as part of the containment program had entered the management zone from the parent range (Service 1991).

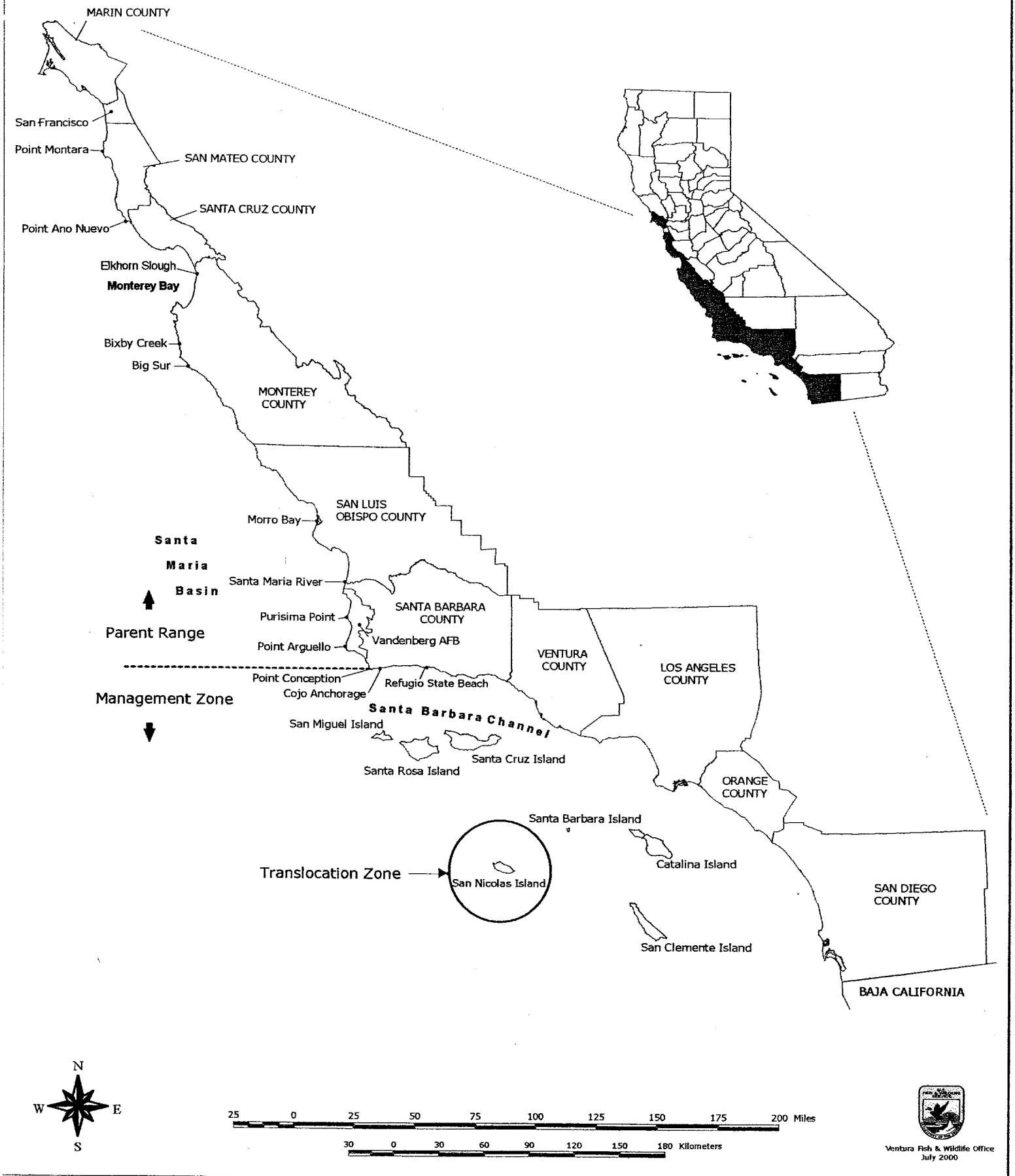
Fifth Annual Report - This individual had been translocated to San Nicolas Island (Service 1992a)

Sixth Annual Report - The two southern sea otters that died after being captured at San Miguel Island as part of the containment program had entered the management zone from the parent range. The three found dead in the parent range had been translocated to San Nicolas Island (Service 1993a).

Table 2. Southern Sea Otter Population Counts 1982 - 1998*

Year	Spring	Fall
1982	1,346	1,351
1983	1,277	1,223
1984	1,303	1,203
1985	1,361	1,215
1986	1,586	1,204
1987	1,661	1,307
1988	1,725	No Survey
1989	1,856	1,607
1990	1,680	1,636
1991	1,941	1,661
1992	2,101	1,715
1993	2,239	1,805
1994	2,359	1,845
1995	2,377	2,190
1996	2,278	2,019
1997	2,229	2,205
1998	2,114	1,937
1999	2,090	1,970
2000	2,317	

* Note: These totals reflect only the numbers of individuals encountered along the mainland.



Place Names Used in the Biological Opinion

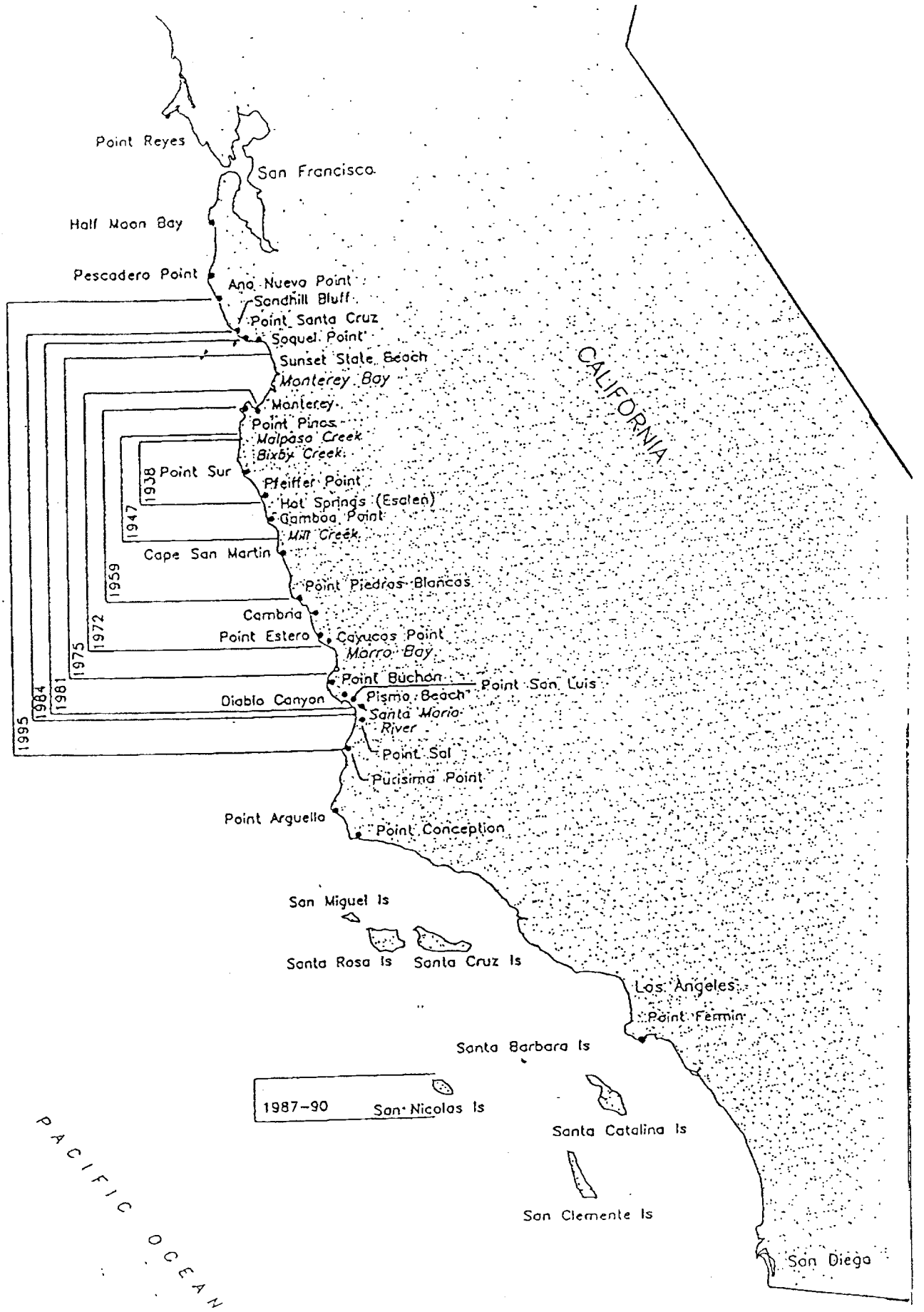
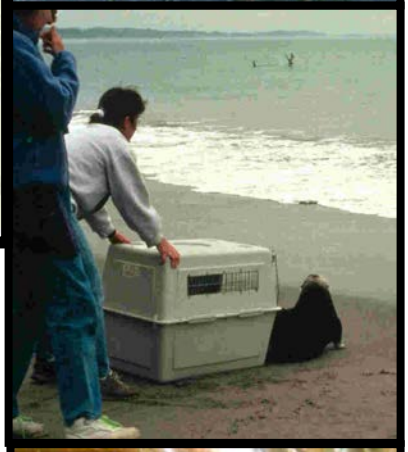


Figure 1. Southern Sea Otter range expansion 1938-1995 (Service 1995a)

Appendix C: Final Evaluation of the Southern Sea Otter Translocation Program, 1987-2012

FINAL
Evaluation of the



Southern Sea Otter Translocation Program 1987-2012

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Executive Summary

In 1982, we, the U.S. Fish and Wildlife Service (Service) identified the translocation of southern sea otters (*Enhydra lutris nereis*) as a critical recovery action for the species. At the time, the southern sea otter's range was limited to the central California coast, and the prospect of a large-scale oil spill was considered to be the sea otter's greatest threat (USFWS 1982). The intent of translocation was to establish one or more southern sea otter colonies in habitat occupied by southern sea otters prior to their decimation by the Pacific maritime fur trade (1784-1911). The creation of additional colonies was expected to reduce the risk that all southern sea otters would be lost in a single catastrophic event.

The southern sea otter is protected by the Endangered Species Act of 1973 (ESA) and the Marine Mammal Protection Act of 1972 (MMPA). Prior to amendment of the MMPA in 1988, these Acts differed with respect to the establishment of experimental (or translocated) populations. Special legislation was passed to authorize the translocation of southern sea otters. Public Law (P.L.) 99-625 allowed the Secretary to establish and implement a southern sea otter translocation program but also required, as part of any such program, the implementation of a management strategy intended to minimize conflict between the experimental sea otter population and shellfish fisheries. The management strategy included designation of a translocation zone, to which the experimental population of otters would be moved, and an otter-free management zone surrounding the translocation zone. The Service was instructed to capture and remove all sea otters within the management zone. The capture and removal of sea otters was intended to contain the new sea otter colony within the bounds of the translocation zone and to prevent sea otters from establishing colonies in the newly designated "no otter" management zone.

Subsequent to the passage of P.L. 99-625, we completed an environmental impact statement (EIS) under the provisions of the National Environmental Policy Act of 1969 (NEPA) that evaluated several translocation sites and included a southern sea otter translocation plan (USFWS 1987). San Nicolas Island, an island approximately 60 miles offshore of southern California, was selected as the preferred translocation site. From 1987 to 1990, 140 southern sea otters were moved to the island from the central coast of California. By the end of 2011, the sea otter colony at San Nicolas Island numbered 48 independent (non-pup) animals.

This document evaluates the southern sea otter translocation program by comparing results to date with the program's objectives and specific failure criteria established at the program's inception. Based on this evaluation, we conclude that the southern sea otter translocation program has failed to fulfill its primary purpose as a recovery action and that our recovery and management goals for the species cannot be met by continuing the program. This conclusion is based on our finding that the program meets failure criterion 2 and on the following additional grounds:

1) the colony of southern sea otters at San Nicolas Island remains small, and its ability to become established and persist is uncertain;
2) establishment and maintenance of an isolated southern sea otter colony at San Nicolas Island will not provide an adequate safeguard should the mainland southern sea otter

population be adversely affected by a catastrophic event;

3) attempts to limit natural range expansion of southern sea otters disrupt seasonal patterns of movement and hinder recovery of the southern sea otter;
4) capturing and moving sea otters out of a "no-otter" management zone has proven to be ineffective as a long-term management action, largely because of the difficulties inherent in sea otter capture, the ability of sea otters to return rapidly to the management zone, and the elevated mortality associated with the holding, transport, and release of sea otters;
5) the recovery strategy for the southern sea otter has changed since the original recovery plan was released in1982, in part because of points 1-4 above; in the Final Revised Recovery Plan for the Southern Sea Otter (USFWS 2003), the recovery team recommends that we declare the translocation program a failure and discontinue maintenance of a "no-otter" management zone.

Background

On January 14, 1977, we, the U.S. Fish and Wildlife Service, listed the southern sea otter as a threatened species under the ESA [16 U.S.C 1531 *et seq*.] on the basis of its small population size, its greatly reduced range, and the potential risk of oil spills [42 FR 2968]. We established a recovery team for the species in 1980, and we approved a recovery plan for the species on February 3, 1982 (USFWS 1982). In the recovery plan, we identified the translocation of southern sea otters as an effective and reasonable recovery action, acknowledging that a translocated southern sea otter population could impact shellfish fisheries that had developed in areas formerly occupied by southern sea otters. The objectives of southern sea otter translocation, as given in the 1982 recovery plan, included: (1) establishing a second colony (or colonies) sufficiently distant from the parent population such that a smaller portion of the southern sea otter population would be affected in the event of a large-scale oil spill; and (2) establishing a database for identifying the optimal sustainable population level for the southern sea otter. We anticipated that translocation would ultimately result in a larger population size and a more continuous distribution of animals throughout the southern sea otter's historic range.

Under the ESA, the Secretary has inherent authority to establish new or translocated populations of listed species. Section 10(j) of the ESA provides the Secretary with additional flexibility to relax the protective provisions of the ESA when translocating a population of a listed species by allowing the Secretary to designate the translocated population as an experimental population. However, the southern sea otter is protected under both the ESA and the MMPA, and at the time, the MMPA did not contain similar provisions. This inconsistency was resolved in the case of the southern sea otter by the passage of P.L. 99-625 (Fish and Wildlife Programs: Improvement; Section 1. Translocation of California Sea Otters) on November 7, 1986, which specifically authorized development of a translocation plan for southern sea otters administered in cooperation with the affected State.

The legislative history of P.L. 99-625 provides insight into the purpose of the law. Authorization for the translocation of southern sea otters was clearly prompted by a desire to protect the species and to promote its recovery. However, Congress

also recognized the potential for conflict between a translocated sea otter population and fisheries and other resource uses. To address this concern, Congress included in P.L. 99-625 a requirement that any southern sea otter translocation plan established under this legislation must include the designation of a management zone that would surround the translocation zone. Sea otters entering the management zone were to be captured using non-lethal means and moved outside the management zone.

If the Secretary of the Interior chose to develop a translocation plan under P.L. 99-625, the plan was to include: (1) the number, age, and sex of southern sea otters proposed to be relocated; (2) the manner in which southern sea otters were to be captured, translocated, released, monitored, and protected; (3) specification of a zone into which the experimental population would be introduced (translocation zone); (4) specification of a zone surrounding the translocation zone that did not include range of the parent population or adjacent range necessary for the recovery of the species (management zone); (5) measures, including an adequate funding mechanism, to isolate and contain the experimental population; and (6) a description of the relationship of the implementation of the plan to the status of the species under the ESA and determinations under section 7 of the ESA. The purposes of the management zone were to: (1) facilitate the management of southern sea otters and containment of the experimental population within the translocation zone; and (2) prevent, to the maximum extent feasible, conflicts between the experimental population and shellfish fisheries within the management zone. Any sea otter found within the management zone was to be treated as a member of the experimental population. We were required to use all feasible non-lethal means to capture sea otters in the management zone and to return them to the translocation zone or to the range of the parent population.

In May 1987, we published a final EIS that analyzed the impacts of establishing a program to translocate southern sea otters from their then-current range along the central coast of California to the northern coast of California, the southern coast of Oregon, or San Nicolas Island off the coast of southern California. We identified translocation to San Nicolas Island as our preferred alternative. A detailed translocation plan meeting the requirements of P.L. 99-625 was included as an appendix to our 1987 EIS. Also in August of 1987, we published implementing regulations for the translocation program [52 FR 29754; 50 CFR 17.84(d)]. These regulations define the translocation and management zones, provide the framework for the program, and include a set of criteria for determining if the translocation should be considered a failure. On August 24, 1987, we began to implement

*The U.S. Fish and Wildlife Service issues a final rule governing a reintroduction of southern sea otters (*Enhydra lutris nereis*) at, and containment of them in the immediate vicinity of, San Nicolas Island, Ventura County, California for two purposes:*

(1) To implement a primary recovery action for a federally listed "threatened" species; and,

(2) to obtain data for assessing translocation and containment techniques, population dynamics, the ecological relationships of sea otters and the near shore community, and the effects on the donor population of removal of individual otters for translocation.

52 FR 29754; August 11, 1987

the translocation plan by moving groups of southern sea otters from the coast of central California to San Nicolas Island. In December, 1987, in coordination with the California Department of Fish and Game, we began capturing and relocating sea otters that entered the designated management zone.

Translocation Program Purpose, Objectives, and Expectations

As is evident in the final rule on the translocation of southern sea otters, the primary purpose of the translocation program was to advance the recovery of southern sea otters. By translocating sea otters, we hoped to establish a self-sustaining southern sea otter population (experimental population) that would provide a safeguard in the event that the parent southern sea otter population were to be adversely affected by a catastrophic event, such as an oil spill.

Recovery Objectives

The translocation plan allowed for a maximum of 70 sea otters to be moved to San Nicolas Island during the first year of the program (USFWS 1987). This number could be supplemented with up to 70 animals annually in subsequent years, if necessary (up to 250 total), to ensure the success of the translocation and to prevent the founding population from declining into an irreversible downward trend. The intent was to ensure that a minimum of 70 sea otters would form the nucleus of a breeding population that would eventually grow in size toward the carrying capacity of the environment.

The anticipated population growth of the San Nicolas Island colony per the translocation plan is shown in Figure 1. The growth rate of the new colony was expected to be between 5 and 15 percent per year. According to the translocation plan, the experimental population at San Nicolas Island would be considered "established" when at least 150 sea otters resided within the translocation zone and the population had a minimum annual recruitment of 20 animals. A population of this size was expected to be sufficient to supply up to 25 immature southern sea otters per year for several years should it become necessary to replenish the parent population after a catastrophic event such as an oil spill. Assuming that a core population of 70

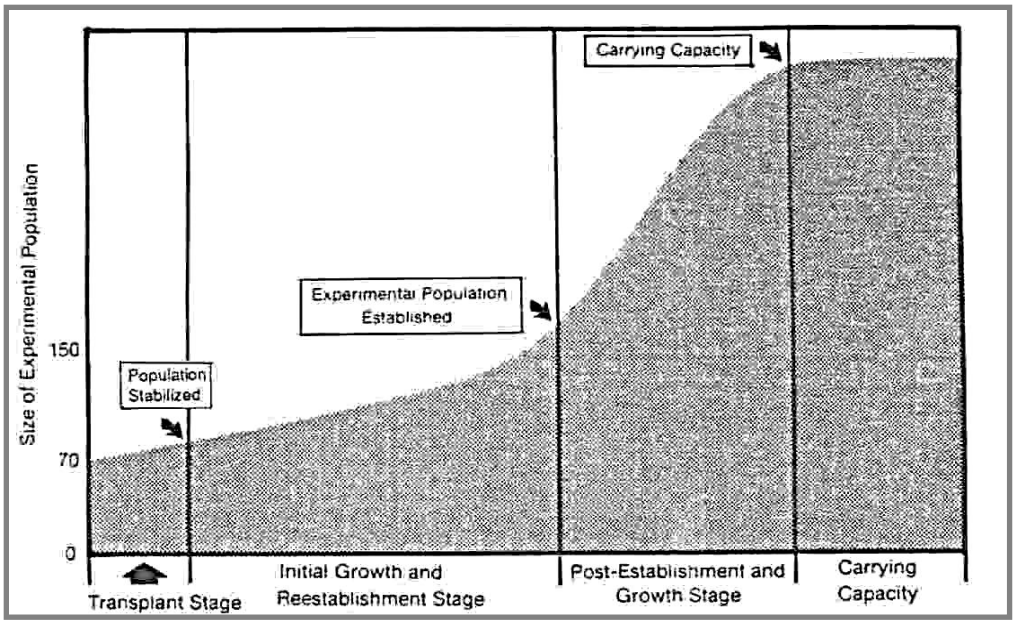

FIGURE 1. EXPECTED POPULATION GROWTH OF THE SAN NICOLAS ISLAND COLONY

southern sea otters could be maintained through translocation, we anticipated that the experimental population could be "established" within as few as 5 or 6 years. Once established, the experimental population was expected to continue to grow, eventually reaching the minimum estimated carrying capacity of the habitat (280 animals; USFWS 1987) after 10-15 years.

Containment Strategy

P.L. 99-625 allowed for the translocation of southern sea otters with the provision that a sea otter management zone be established around the translocation zone. The management zone was intended to isolate the experimental population and to limit potential impacts of the experimental population on existing commercial fisheries. Southern sea otters found within the management zone were to be captured using non-lethal techniques and relocated to the parent or experimental population. Both the California Department of Fish and Game and the Marine Mammal Commission advocated this approach, also known as zonal management. Public Law 99-625 states that any sea otter found in the designated management zone is to be considered a member of the experimental population, regardless of whether the animal entered the management zone from the translocation zone or from the parent population. However, it is clear, based on Congressional testimony and the final rule [52 FR 29754; August 11, 1987], that southern sea otter removal activities were expected to focus on animals dispersing from the translocation zone.

After discussions with the California Department of Fish and Game, we defined the sea otter management zone (Figure 2) to include the coastline from Point Conception to the Mexican border and all of the offshore

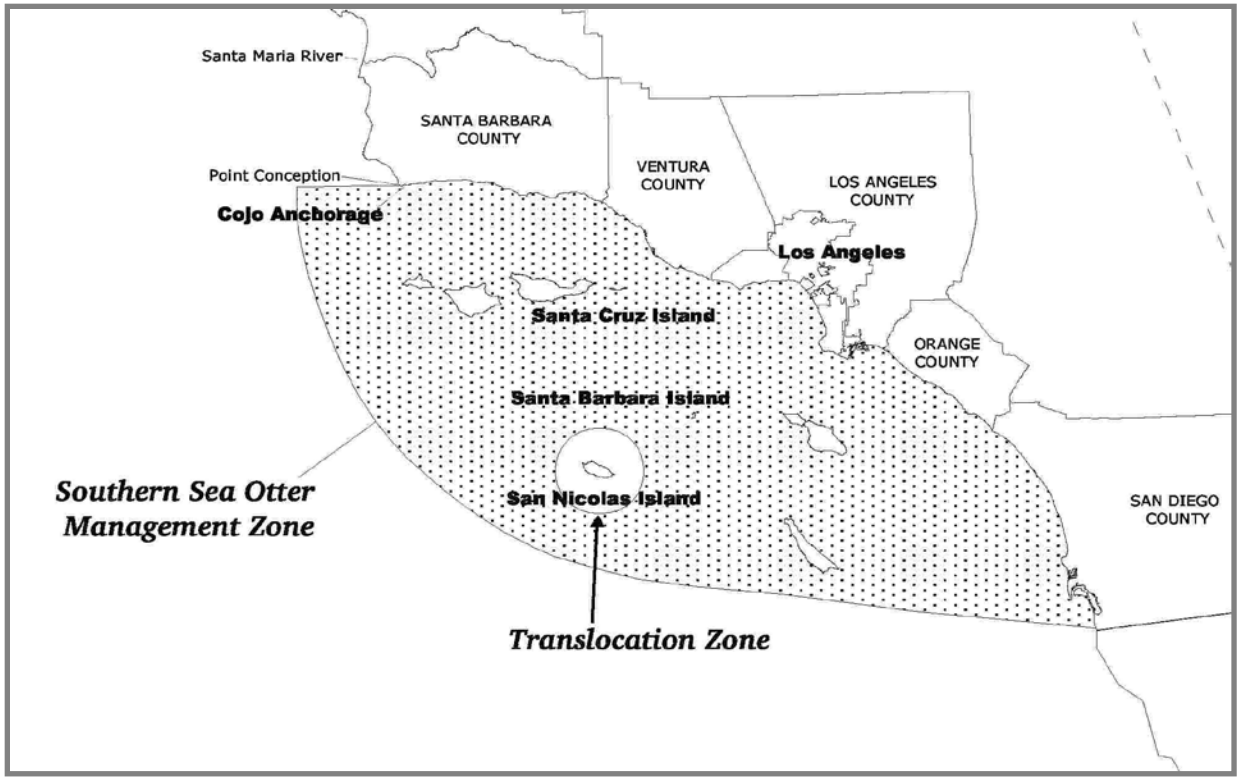

FIGURE 2. TRANSLOCATION AND MANAGEMENT ZONES

islands except San Nicolas Island. This management zone created an artificial southern barrier for the parent population that was to be maintained as long as the translocation program was in effect.

The translocation plan called for the Service and the California Department of Fish and Game to enforce the management zone jointly. We relied on sightings and location reports from other Federal and State agency personnel, fishermen, boat skippers, and the general public. To this end, we publicized a sea otter hotline (Figure 3), which we hoped would allow us to receive reports of sea otters in the management zone in a timely manner. Upon verification of a sea otter sighting, field crews were mobilized to capture sea otters and transport them to areas outside the management zone.

Ultimately, it was recognized that the long-term feasibility of non-lethal sea otter containment would be dependent on the availability of adequate release sites outside of the management zone. Participants in a workshop convened by the Marine Mammal Commission in October 1984 noted that sea otters ultimately could reach carrying capacity within designated sea otter zones and that the continuation of zonal management under such circumstances would require some form of culling or birth control (Marine Mammal Commission 1985). Artificial control of fecundity (birth control) and selective or random non-lethal removal of sea otters residing in the translocation zone were included as reserve clauses in the regulations implementing P.L. 99-625 as possible containment measures, although the area into which sea otters might be released was not specified [50 CFR 17.84(d)]. In the final rule for the southern sea otter translocation program, we clearly stated that we had no intention of using these population limiting techniques until

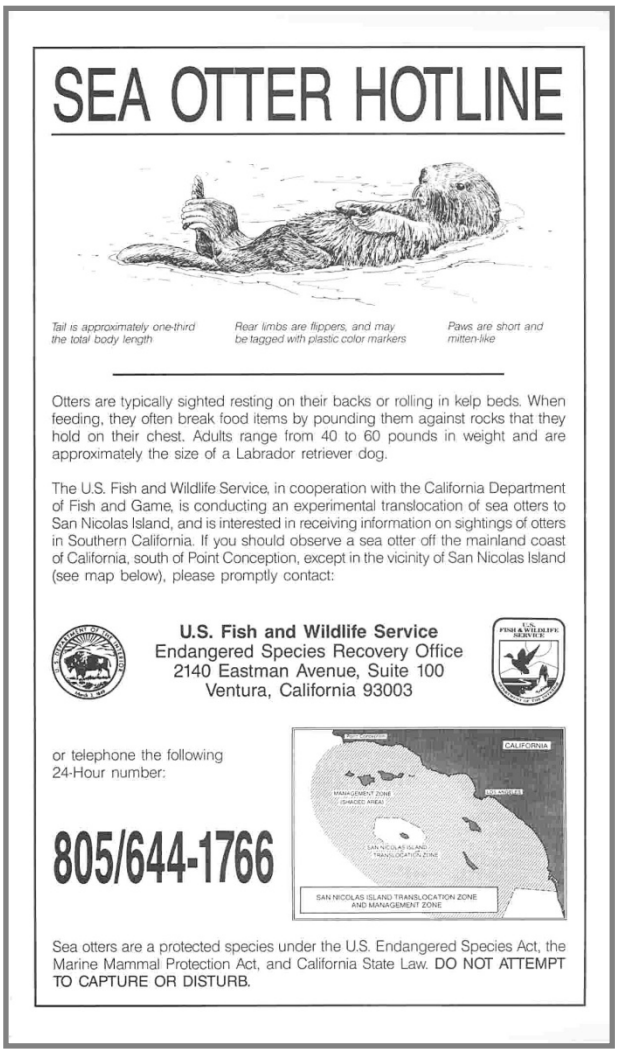

FIGURE 3. SEA OTTER HOTLINE POSTER

the southern sea otter population was fully recovered, and then only after consultation with the California Department of Fish and Game, the Marine Mammal Commission, and the interested public [52 FR 29754].

Summary of the Translocation Program (1987-2012)

Southern sea otters were translocated to San Nicolas Island from August 1987 to July 1990. During this period, 252 sea otters were captured along the central California coast, but only 139 of these animals were actually translocated to San Nicolas Island (USFWS 1995, Rathbun *et al.* 2000). More

than 100 southern sea otters were deemed unsuitable for translocation based on their age, sex, or general health; these animals were released near their capture sites. At least 6 of the 252 sea otters captured died of stress-related conditions while being held prior to their transport to San Nicolas Island. One rehabilitated southern sea otter pup (found orphaned on the central coast of California and cared for by the Monterey Bay Aquarium) was also released at San Nicolas Island, bringing the total number of sea otters released at the island to 140.

All sea otters translocated to San Nicolas Island were flipper-tagged using color-coded tags. In addition, a passive integrated transponder (PIT) tag unique to each animal was inserted under the skin of each translocated sea otter. Many of the sea otters taken to San Nicolas Island were also fitted with radio transmitters to track their movements. The primary purpose of the tagging and radio telemetry efforts was to assist in collecting data called for in the translocation plan, including information on population dynamics and ecological relationships between sea otters and the nearshore marine community. A secondary purpose was to locate and track sea otters that left the translocation zone.

Translocation Results

During the first year of translocation efforts (August 1987–July 1988), 69 sea otters were translocated to San Nicolas Island, but only 20 were observed at the island by the end of the period. Three of the 69 animals died at San Nicolas Island, 2 were found dead on the mainland (1 had been shot), 3 were suspected to have been killed in fishing gear, and 1 was recaptured and removed from the management zone (Rathbun *et al.* 1990). Forty animals were missing and were presumed to have dispersed from the translocation zone because there was no evidence of additional mortality at the island. Emigration from San Nicolas Island was higher than anticipated given the abundant food resources available to sea otters there, the island's overall habitat quality, its isolated location, and the presumed barrier afforded by the deep waters surrounding it.

During the first year of the project, captures of sea otters for translocation to San Nicolas Island were less efficient than expected. Sea otters became increasingly vigilant after exposure to intense capture activities (dip netting) in their home territories. Their vigilance affected the ability of capture teams to select specific individuals and increased the time needed to obtain the proper number and composition of sea otters for translocation. Capture delays imposed additional stress on animals awaiting translocation in holding tanks and contributed to the deaths of four sea otters before they could be translocated (USFWS 1988).

Because of the unexpected mortalities and high emigration encountered during the first year, we amended our regulations for the translocation program in 1988 [53 FR 37577; September 27, 1988]. The amendments were intended to minimize sea otter stress, to improve the survival of translocated animals, and to minimize dispersal of sea otters from the translocation zone. Specifically, we provided more flexibility in selecting the ages of sea otters for translocation, eliminated the restriction to capture sea otters only within an August to mid-October time frame, eliminated the requirement to move a specified number of southern sea otters previously implanted with transmitters, provided the flexibility either to transport sea otters immediately or to hold them on the mainland before releasing them at San Nicolas Island, and

eliminated the requirement to translocate a minimum of 20 sea otters at a time. Based on data collected during the first year of translocation, we believed that younger sea otters were more likely to remain at San Nicolas Island (Rathbun *et al.* 1990). The second year of the translocation effort focused on the translocation of younger sea otters. These animals were transported in smaller groups (one to four animals) to minimize the time they were held in captivity. Once at the island, they were immediately released from shore in the vicinity of other sea otters. By the end of the second year, a total of 126 sea otters had been moved to San Nicolas Island, but only 17 were observed at the island (USFWS 1989, USFWS 1990). Even with modifications to the program in place, emigration from the island by newly translocated animals continued to be high.

During the third year of the program, 14 additional sea otters were translocated to San Nicolas Island, with the last translocation occurring on July 19, 1990 (USFWS 1991). By December of that year, the colony at the island was estimated to total 15 adult or sub-adult animals and three dependent pups.

No translocations occurred during the fourth year of the program because of difficulties encountered with implantation of radios in sea otters to be translocated to San Nicolas Island, an increased need for coordination amongst interested parties, and logistical constraints.

Following the fourth year of the translocation program, the sea otter population at the island was small, about 15 animals, but appeared to be stable. The sea otters that were present were consistently observed at specific areas of the island, and it was hoped that these animals would become the founding nucleus of a larger colony. There were concerns that the introduction of additional translocated animals would disrupt the resident sea otters, possibly resulting in additional deaths or emigration from the island. Due to the perceived precariousness of the colony and concerns that translocation itself might affect the success of the colony, we discontinued the translocation of sea otters to San Nicolas Island. Since July 1990, no sea otters have been translocated to the island. However, we continued monitoring the sea otters remaining in the translocation zone. Sea otter surveys at San Nicolas Island are now conducted by the Biological Resources Discipline of the U.S. Geological Survey on a quarterly basis.

Of the 140 sea otters released at San Nicolas Island between August 1987 and July 1990, the fate of 70 is known. Three were found dead at San Nicolas Island within a few days of being translocated. Thirty-six are known to have returned to the parent population range, and 18 were either captured (11) or found dead (7) in the management zone, months to years after they were translocated (Figure 4). At least 13 sea otters are thought to have remained at San Nicolas Island after their release. The fate of the other 70 animals is unknown. Although an intense effort was made to locate translocated sea otters at San Nicolas Island and in the management zone, observations of sea otters that returned to the parent population range were gathered only opportunistically. Despite the absence of a focused effort to identify translocated sea otters that returned to the parent range, many were resighted there, suggesting that additional sea otters may have returned to the parent range without being detected. We believe that most of the missing sea otters emigrated from the island and that many of them probably returned to the parent population.

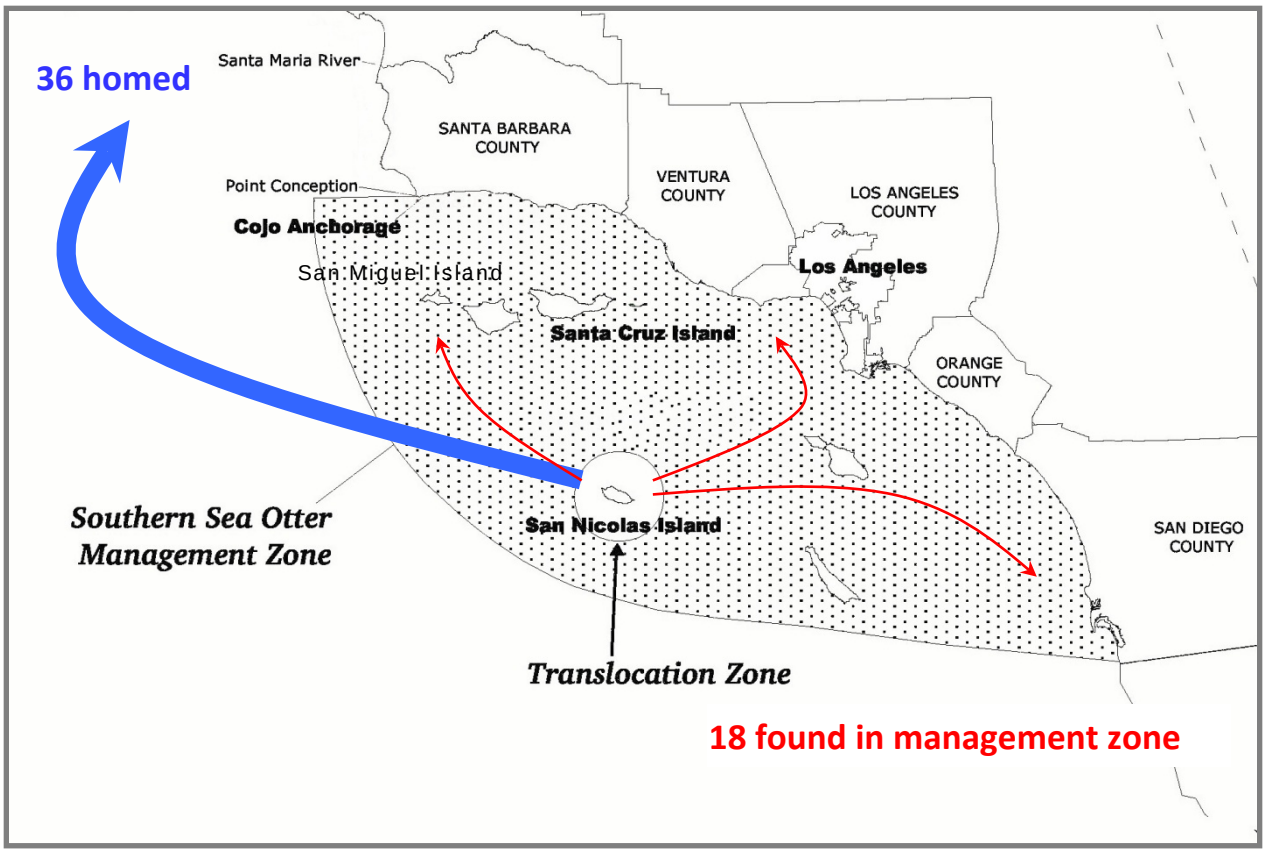

FIGURE 4. SEA OTTER EMIGRATION FROM SAN NICOLAS ISLAND

Some of the missing animals may also have died as a consequence of translocation, but no additional deaths have been verified.

Containment Results

Southern sea otter containment was a cooperative effort between the Service and the California Department of Fish and Game. Containment efforts were intended to keep the management zone free of sea otters in accordance with P.L. 99-625 and our implementing regulations. Containment operations consisted of three interdependent activities: (1) surveillance of the management zone; (2) capture of sea otters in the management zone; and (3) relocation of captured sea otters to the parent range or San Nicolas Island.

Containment activities were triggered by sightings of southern sea otters in the management zone. In most instances, these sightings were made by fishermen or local residents. Federal or State biologists investigated each reported sighting to confirm the presence of sea otters prior to launching capture efforts. The number of sea otter reports we received from people working, recreating, or living near the waters of the management zone varied from year to year, with the majority of the reports (37) received during the first year of the translocation program (USFWS 1988). In nearly all cases, the number of sea otters confirmed in the management zone was small, generally one to three animals. It is likely that some animals were reported multiple times while others transited the management zone without being detected. Sea otter sightings at San Miguel Island, the westernmost of the northern Channel Islands, proved to be the exception. At San

Miguel Island, groups of as many as nine sea otters were consistently observed in the vicinity of Point Bennett (at the westernmost end of San Miguel Island) from 1991 to 1993. Capturing southern sea otters in the management zone using non-lethal means proved to be relatively difficult, and our capture efforts were only minimally successful. Three capture techniques were available for southern sea otter containment: (1) dip netting; (2) the deployment of passive entangling nets; (3) and the use of diver-operated traps (Wilson traps). The use of Wilson traps operated by divers equipped with closed-circuit SCUBA proved to be the most effective technique. Sea otters in the management zone were most often found in kelp beds, a circumstance that effectively eliminated the dip-netting option and favored the Wilson-trapping option. Sea otters in the management zone were also typically found in low densities or were found in areas with large numbers of pinnipeds, making the use of entangling nets impractical. Upon responding to reports of sea otters in the management zone, we were often unable to locate the animals that had been sighted. Even when sea otters were found, capture efforts were successful only about half the time.

Once captured, sea otters were transported back to the parent range for release. Public Law 99-625 allowed sea otters captured in the management zone to be released in either the translocation zone or the mainland range, but when we considered our previous efforts to move sea otters to the island, we concluded that animals removed from the management zone would not likely stay at San Nicolas Island. We believed that sea otters originating from the island that had already left it once were likely to do so again. Additionally, sea otters had proven that they were capable of negotiating deep ocean channels and could travel much longer distances than previously anticipated. Thus, during our initial containment efforts, we returned individual animals to their original capture sites on the central coast of California instead of releasing them back into the translocation zone.

However, the strategy of releasing sea otters at their original capture sites resulted, in most cases, in lengthy travel times and additional handling of the animals. To reduce this source of stress on captured sea otters, we revised our strategy in the belief that it was more prudent to release recaptured animals at more easily accessible sites in the northern portion of the parent range. Despite the increased distance, the accessibility of these sites reduced transport times and resulted, we believed, in reduced stress and the improved well-being of moved sea otters. We also hoped that releasing animals at the northern end of the range would reduce the likelihood that animals would return to the management zone because of the greater distances they would have to travel.

From December 1987 to February 1993, 24 sea otters were captured and removed from the management zone and returned to the parent range (Figure 5). Eleven of these animals had been translocated to San Nicolas Island, four were offspring of sea otters translocated to San Nicolas Island, and at least three swam into the management zone from the parent range. The origins of the remaining six animals were unclear; they had either moved down from the parent range or were offspring of sea otters translocated to San Nicolas Island. Two of the sea otters removed from the management zone returned to it after traveling hundreds of kilometers, only to be recaptured and moved again.

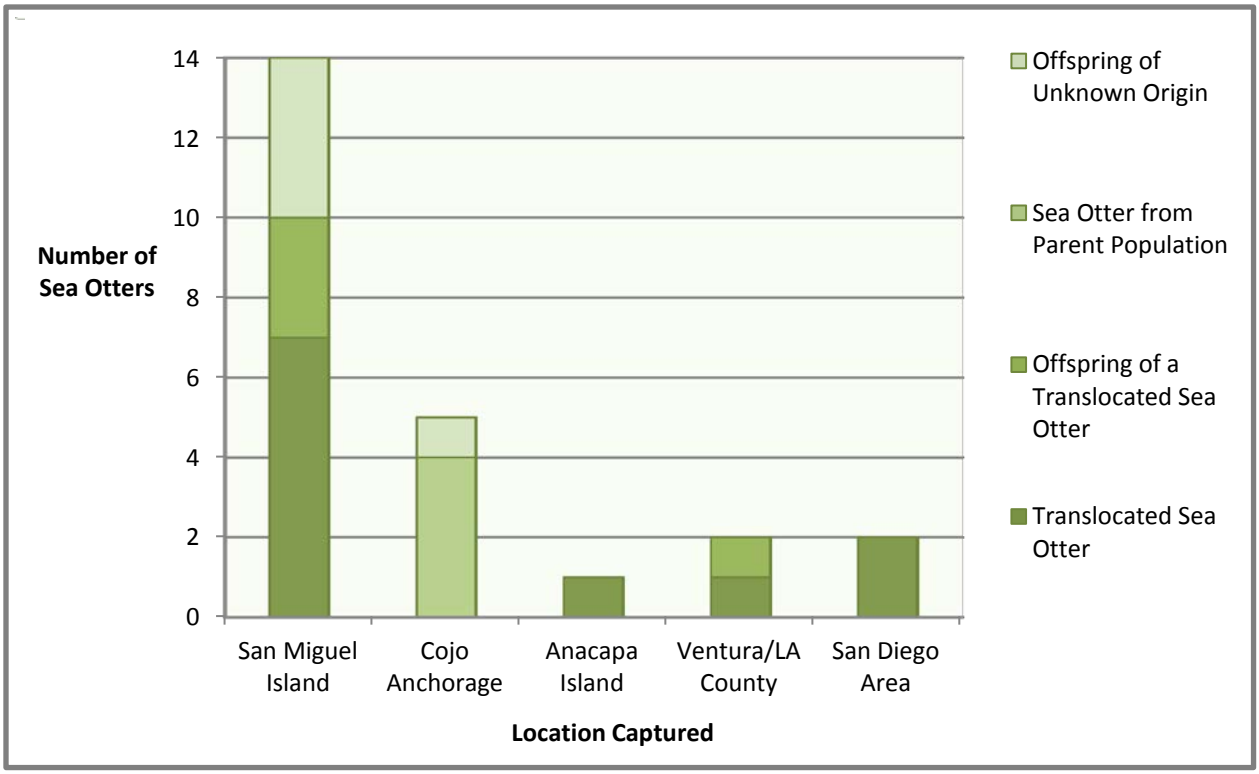

FIGURE 5. SEA OTTERS CAPTURED IN MANAGEMENT ZONE

In February 1993, two sea otters that had been recently captured in the management zone were found dead shortly after their release in the range of the parent population. In total, four sea otters were known or suspected to have died within two weeks of being moved from the management zone. We were concerned that sea otters were dying as a result of our containment efforts; therefore, in 1993 we suspended all sea otter capture activities in the management zone to evaluate sea otter capture and transport methods. We also recognized that available capture techniques, which proved to be less effective and more labor-intensive than originally predicted, were not an efficient means of containing southern sea otters.

From 1993 to 1997, few sea otters were reported in the management zone, and there appeared to be no immediate need to address sea otter containment. In 1997, the California Department of Fish and Game notified us that it intended to end its southern sea otter research project and would no longer be able to assist us if we resumed capturing sea otters in the management zone.

In 1998, a group of approximately 100 southern sea otters moved from the parent range into the northern end of the management zone. At the same time, range-wide counts of the species indicated a decline of approximately 10 percent between 1995 and 1998. In light of the decline in southern sea otter numbers, we were concerned about the potential effects on the parent population of moving the large number of southern sea otters that had moved into the management zone. We asked the southern sea otter recovery team, a team of biologists with expertise pertinent to southern sea otter recovery, for their recommendation regarding the capture and removal of sea otters in the management

zone. The recovery team recommended that we not move sea otters from the management zone to the parent population because moving large groups of sea otters and releasing them within the parent range would be disruptive to the social structure of the parent population (DeMaster 1998). We agreed with their recommendation.

In order to notify stakeholders of our intended course of action, we held two public meetings in August 1998. At these meetings, we provided information on the status of the translocation program, solicited general comments and recommendations, announced that we intended to reinitiate consultation under section 7 of the ESA for the southern sea otter containment program, and stated that we intended to begin the process of evaluating the translocation program against the failure criteria established for it.

We distributed a draft biological opinion under section 7 of the ESA for the southern sea otter containment program to interested parties for comment on March 19, 1999, and issued a final biological opinion on July 19, 2000. Our reinitiation of formal consultation under section 7 of the ESA was prompted by the receipt of substantial new information on the population status, behavior, and ecology of the southern sea otter that revealed adverse effects of containment that were not previously considered. In the biological opinion, we cited the following information and circumstances as prompting reinitiation: (1) in 1998 and 1999, southern sea otters moved into the management zone in much larger numbers than in previous years; (2) analysis of carcasses indicated that southern sea otters were being exposed to environmental contaminants and diseases that could be affecting the health of the population throughout California; (3) range-wide counts of southern sea otters indicated that numbers were declining; (4) recent information, in particular the observed effects of the Exxon Valdez oil spill, indicated that southern sea otters at San Nicolas Island would not be isolated from the potential effects of a single large oil spill; and (5) the capture and release of large groups of southern sea otters could result in substantial adverse effects on the parent population. The biological opinion concluded with an assessment that continuation of the containment program would likely jeopardize the continued existence of the species on the grounds that (1) reversal of the southern sea otter's population decline was essential to the survival and recovery of the species, whereas continuation of containment could cause the direct deaths of individuals and disrupt social behavior in the parent range, thereby exacerbating population declines; and (2) expansion of the southern sea otter's distribution was essential to the survival and recovery of the species, whereas continuation of the containment program would artificially restrict the range to the area north of Point Conception, thereby increasing the vulnerability of the species to oil spills, disease, and stochastic events.

On January 22, 2001, we issued a policy statement regarding the capture and removal of southern sea otters in the designated management zone [66 FR 6649]. Based on our July 2000 biological opinion, we determined that the containment of southern sea otters was not consistent with the requirement of the ESA to avoid jeopardy to the species. The notice advised the public that we would not capture and remove southern sea otters from the management zone pending completion of our reevaluation of the southern sea otter translocation program, which would include the preparation of a supplement to our 1987 EIS and release of a final evaluation of the

translocation program that contained an analysis of failure criteria.

Current Status of the Translocated Sea Otter Colony

In 2011, 48 independent southern sea otters were counted at San Nicolas Island. Data from quarterly counts indicate that the population has fluctuated between 13 and 48 independent animals since July 1990. Dependent pups are frequently observed with these independent adults. Within the past several years there has been growth of the population, which is almost certainly due to the birth and recruitment of pups (Table 1) rather than to the immigration of sea otters to the island. One southern sea otter pup was born at San Nicolas Island during the first year of the translocation program (1987-88), and new pups have been observed in each subsequent year. More than 162 pups are known to have been born at the island since the program's inception.

TABLE 1. POPULATION STATUS OF SEA OTTERS AT SAN NICOLAS ISLAND (SNI), 1987-2011

Year after initial release	Year	Number Released at SNI	Minimum number born at SNI*	High count independent sea otters**	Number of pups associated with high count
0	87	60	1	27	0
1	88	41***	1	28	0
2	89	35	3	28	0
3	90	4	5	14	3
4	91	0	8	14	2
5	92	0	4	13	1
6	93	0	6	12	0
7	94	0	5	16	1
8	95	0	3	14	2
9	96	0	6	17	2
10	97	0	5	16	0
11	98	0	3	15	0
12	99	0	4	21	2
13	00	0	6	21	4
14	01	0	7	27	1
15	02	0	8	29	3
16	03	0	8	33	5
17	04	0	7	32	3
18	05	0	7	31	1
19	06	0	11	37	7
20	07	0	10	37	4
21	08	0	9	37	5
22	09	0	14	33	6
23	10	0	10	46	5
24	11	0	11	48	5
Total		140	162	--	--

*The minimum number of pups known to have been born at the island during each calendar year is greater than the number of pups detected during any single count.
**Totals exclude dependent pups and reflect the highest count made in each calendar year. Because the counts are organized here by calendar year, they do not match exactly the counts reported for years 1-4 of the program under "Translocation Results," when results were initially summarized by the year of program (August to July) following the first August 1987 releases.
***Includes one rehabilitated sea otter from Monterey Bay Aquarium.
Data source: U.S. Geological Survey.

In 2004 (and again in 2006), we confirmed the presence of at least one sea otter at San Nicolas Island that had been translocated there. However, all of the sea otters now residing at San Nicolas Island must be the offspring of those originally translocated to the island. This is because the founding animals were translocated between 22 and 25 years ago, and the average life expectancy of southern sea otters in the wild is approximately 10 to 15 years (Riedman and Estes 1990).

As noted above, more than 162 southern sea otter pups have been born at San Nicolas Island, but only about 48 independent sea otters reside there as of 2011. In the more than two decades since the end of the

translocation phase, we have continued to assess whether emigration (subsequent to the initial dispersal) or high rates of mortality have contributed to the failure of the colony to become established. In light of the observed level of pupping, two scenarios are possible: 1) continued emigration from the island or unexpected levels of mortality have been suppressing population growth, or 2) observed population growth is what might be expected for a small population that is not at a stable age distribution and is subject to the effects of demographic stochasticity.[1] The question of which scenario is likely occurring can be answered only if the intrinsic rate of population increase is known. If the intrinsic rate of population increase is as high as 17-20 percent, as has been seen in Washington and Alaska (Estes 1990), chronic losses of animals due to emigration or mortality are occurring. However, if the intrinsic rate of population increase is comparable to the 5-6 percent seen in the mainland southern sea otter population, the observed population trajectory could have been produced by additional losses of only a small number of juveniles and subadults in the early years of the program and no additional losses of these classes since (Carswell 2008).

Without knowing the intrinsic rate of population growth, we are unable to ascertain which scenario is likely occurring at San Nicolas Island. However, evidence of high adult survival there from 2003-2004 based on the mark-resight analysis of radio-tagged animals (Bentall 2005), although limited to a small sample size and short time period, provides some basis for assuming that a scenario of higher intrinsic growth is more likely than the lower growth scenario. If this is indeed the case, then emigration or higher mortality of juveniles and sub-adults may be responsible for hindering population growth.

Some low level of continuing emigration from San Nicolas Island to the mainland range cannot be ruled out. Although emigration has not been documented since the early years of the translocation program, there has been little opportunity to detect it. Two juveniles radio-tagged in 2003 disappeared suddenly, but the fates of these animals are unknown (USGS unpub. data).

If unexpectedly high mortality is occurring, its cause remains unidentified. There is no evidence of food limitation at San Nicolas Island. Tinker *et al.* (2008) observed that sea otters there spent half as much time foraging as did sea otters along the central California coast and were in better body condition. There is also only limited evidence of disease among the San Nicolas Island sea otters (Bentall 2005). There has been considerable speculation about whether the fishing gear set at San Nicolas Island, most notably lobster traps, represents a significant source of mortality for the southern sea otter colony. No sea otters have been observed in lobster traps at San Nicolas Island, and our ability to detect mortalities is severely limited by our ability to track individual animals and monitor fishery interactions. However, we recognize the potential that southern sea otters could become trapped and drown in lobster traps. Controlled experiments conducted by the U.S. Geological Survey and the Monterey Bay Aquarium demonstrated that sea otters would enter a baited commercial finfish trap with inner trap funnel openings of 5.5 inches

[1] A stable age distribution refers to the proportion of individuals in each age class when a population has had sufficient time to stabilize and the age-specific fertility and mortality rates remain constant. Demographic stochasticity refers to the variability in population growth rates that results from random differences among individuals in survival and reproduction within a season.

in diameter (Hatfield and Estes 2000). Hatfield *et al.* (2011) confirmed that some sea otters exposed to finfish, lobster, and mock Dungeness crab traps in a captive setting would succeed in entering them (Hatfield *et al*. 2011). We are continuing to assess the risk to sea otters posed by traps.

Previous Evaluations of the Southern Sea Otter Translocation Program

From the beginning of the translocation program, the annual translocation reports included a discussion of failure criteria. As early as 1990 (USFWS 1990), these reports noted that the program appeared to meet failure criterion 2, under which the program would be considered a failure if fewer than 25 sea otters remained at San Nicolas Island within 3 years of the initial transplant. However, failure criterion 3 allowed for a delay in terminating the translocation program under criterion 2 if reproduction was occurring and the degree of dispersal into the management zone was small. We chose to continue monitoring the translocated colony. In subsequent years, three additional and more comprehensive internal reviews of the program were completed. Although each of the evaluations concluded that the translocation program was failing to meet its objectives, none resulted in a formal administrative finding that the translocation program had failed.

1992 Draft White Paper—Zonal Management and Southern Sea Otter Recovery

In March 1992, we prepared a draft "white paper" for a meeting with the California Department of Fish and Game (USFWS 1992). The paper included background material on the rationale for listing the southern sea otter as a threatened species, the recovery objective of the 1982 southern sea otter recovery plan, a summary of the translocation program, identification of major issues affecting sea otter recovery, and several options for the future of the southern sea otter translocation program. The draft white paper explored two major questions: (1) does the existing sea otter management zone interfere with recovery? and (2) is it feasible to maintain a management zone using non-lethal techniques? We noted that establishing a translocated sea otter population at San Nicolas Island had proven to be difficult and concluded, based on our experience with the *Exxon Valdez* oil spill in 1989, that even if the San Nicolas Island sea otter colony were to become established and result in a viable population, it might not provide significant protection to the species if a large oil spill were to come in contact with the parent population.

We considered three options for the future of the translocation program in the draft

The 1992 Draft White Paper concluded:

Continuing containment activities (i.e. at San Miguel Island) may result in the removal of at least some, and possibly the remaining, sea otters. However, maintaining the management zone free of sea otters using non-lethal techniques ultimately will not work using current techniques. And as long as the southern sea otter is listed as threatened or endangered and population growth is essential to recovery, using culling techniques or techniques that reduce reproduction is unacceptable. Restoring the southern sea otter to a non-threatened, non-endangered status would be enhanced by the establishment of the San Nicolas Island colony and populations of otters south of Point Conception (currently the management zone) if recolonization occurs.

USFWS 1992

white paper: A) eliminate the management zone, allow sea otters to remain at San Nicolas Island, and allow sea otters to expand their range naturally; B) determine the translocation program to be a failure and attempt to remove sea otters from the translocation and management zones; or C) leave sea otters at San Nicolas Island and continue efforts to maintain the management zone. The paper also noted that elimination of the management zone would allow sea otters to expand their range naturally, thereby benefiting sea otter recovery. In discussions between the Service and the State, the California Department of Fish and Game expressed its desire to maintain zonal management options for sea otters. As a result, the white paper was never finalized, and no formal action was taken to declare the translocation program a failure.

1993 Draft Evaluation

In 1993, three years after the last sea otter was released at San Nicolas Island, population surveys indicated that the number of sea otters at the island was not increasing. Prompted by this lack of growth, we prepared a draft evaluation of the translocation program (USFWS 1993).

The draft evaluation assessed the entire translocation program, including the status of the San Nicolas Island colony, translocation efforts and methods, containment efforts and methods, and failure criteria. We noted that the degree of dispersal of sea otters from San Nicolas Island and the mortalities associated with the program were both much higher than anticipated. Stress to sea otters associated with handling and release was thought to be a significant factor in these results.

Despite the fact that most of the translocated sea otters had apparently left the island, few animals settled in the management zone (11 of 140 translocated). Sea otter containment success up to that point was due to the presence of only small numbers of sea otters within the zone and the successful identification of key areas where sea otters tended to congregate, such as Cojo Anchorage and San Miguel Island. Although the effectiveness of capture operations was improved by the addition of divers equipped with closed-circuit SCUBA, the 1993 draft evaluation again questioned whether a non-lethal, zonal management program for sea otters was ultimately feasible.

The overall intent of the 1993 draft evaluation was to assess the translocation program and to determine whether the program met regulatory criteria to be declared a failure. In that evaluation, the Service concluded that the translocation program had failed under criterion 2; however, the document had a limited distribution and was never finalized. When we discussed declaring the translocation program a failure with the California Department of Fish and Game, they requested that we continue the program to preserve the option of zonal management of sea otters in southern California to reduce conflicts with local shellfish fisheries. As a result, we deferred our decision on the translocation program.

2000 Biological Opinion

In 1998, large groups of male sea otters began to enter the management zone from the parent population. In subsequent years, this movement was determined to be seasonal in nature, with most sea otters entering the management zone in the winter months and returning to the parent range in spring (Tinker 2002, unpubl. data; Tinker *et al.* 2006). The movements coincided with declining population counts throughout the range of the parent population, and the

receipt of substantial new information led us to reinitiate formal consultation under the ESA. The resulting biological opinion focused on the containment portion of the southern sea otter translocation program and sought to determine whether containment activities would impose additional adverse effects on the mainland population that were not considered when we developed the translocation plan. The resulting biological opinion was finalized in July 2000 (USFWS 2000).

After reviewing the status of the southern sea otter, the environmental baseline for the action area, the effects of sea otter containment, and cumulative effects, we concluded that continuation of sea otter containment would likely jeopardize the continued existence of the species. Our conclusion was based on two determinations: 1) reversal of the southern sea otter's population decline was essential to its survival and recovery, and continuation of sea otter containment could lead to deaths of sea otters and disruption of the social structure of the population, thus exacerbating the population decline; and 2) expansion of the southern sea otter's distribution was essential to its survival and recovery. Continuing sea otter containment would restrict the range of the species, resulting in its increased vulnerability to oil spills, disease, and stochastic events. Upon completion of the biological opinion, we published a notice of policy regarding the capture and removal of sea otters from the designated management zone [66 FR 6649, January 21, 2001]. We determined that we would not capture and remove sea otters from the management zone pending our reevaluation of the translocation program, including the preparation of a supplemental EIS (SEIS) and release of a final evaluation of the translocation program.

2005 Draft Evaluation

In 2005, we released a Draft SEIS on the translocation program. A draft evaluation of the translocation program was included as Appendix C. We solicited comments on both the Draft SEIS and the draft evaluation during the public comment period, which began on October 7, 2005 [70 FR 58737] and was extended on December 30, 2005 [70 FR 77380] to March 6, 2006. Comments received during the five-month comment period, including those regarding the draft translocation evaluation, are summarized and addressed in Appendix G to the Revised Draft SEIS.

2011 Draft Evaluation

In 2011, we released a Revised Draft SEIS on the translocation program. A revised and updated draft evaluation of the translocation program was included as Appendix C. We solicited comments on both the Revised Draft SEIS and the revised draft evaluation during the public comment period, which began on August 26, 2011 [76 FR 53381]. The initial 60-day comment period closed on October 24, 2011 but was reopened between November 4, 2011 and November 21, 2011 [76 FR 68393]. Comments received during the comment period, including those regarding the revised draft translocation evaluation, are summarized and addressed in Appendix G to the Final SEIS.

Current Evaluation of the Translocation Program

Since the inception of the southern sea otter translocation program, we have been evaluating data, consulting with our primary partners (the California Department of Fish and Game and the Marine Mammal Commission), and making adjustments to the program. This latest evaluation updates the 2011 draft evaluation, compares our expectations for the program with results attained to date, evaluates the relationship

between the translocation program and recovery needs, and provides analysis of the specific failure criteria identified in the translocation plan.

COMPARISON TO OTHER SEA OTTER TRANSLOCATIONS AND FUTURE OF THE SAN NICOLAS ISLAND POPULATION

Experimental translocation of sea otters began in 1951. Initially, there were several attempts to move relatively small numbers of northern sea otters in Alaska. All early attempts failed, largely due to high mortality associated with a general lack of knowledge about how best to transport sea otters. A series of northern sea otter translocations occurred from 1965 to 1972. During this period, 708 northern sea otters were translocated from the Aleutian Islands and Prince William Sound, Alaska, to the Pribilof Islands, southeast Alaska, British Columbia, Washington, and Oregon (Jameson *et al.*1982).

Translocations to southeast Alaska, British Columbia, and Washington were eventually successful, while those to the Pribilof Islands and Oregon failed (Riedman and Estes 1990). In all cases, post-release dispersal of sea otters was evident (Estes *et al.*1989). Considering previous translocation efforts, Jameson *et al.* (1982) concluded the following: 1) the number of sea otters at a transplant site decreases dramatically soon after release; 2) emigration appears to be an important factor in the initial decline of translocated populations; 3) small populations (<25-30 animals) are probably destined for extinction because they are incapable of reproducing at a rate that is greater than the combined rates of mortality and emigration; 4) it is possible to select a general area to reestablish sea otters, but the exact locations are difficult to predict; and 5) it is possible to reestablish sea otters in unoccupied habitat, but it appears to require a relatively large nucleus population.

The southern sea otter translocation program is the most recent and the most extensively planned of all sea otter translocations. Capture and transport techniques were thought to be sufficiently developed to minimize mortalities; the number of sea otters to be translocated was considered sufficient to establish a colony rapidly in unoccupied habitat; and the selected translocation site, San Nicolas Island, was surrounded by deep ocean channels and thought to be situated sufficiently far from shore to minimize emigration and dispersal (USFWS 1987). In retrospect, our expectations for success were overly optimistic. Our results to date indicate that the southern sea otter translocation program has followed the same general pattern of all previous sea otter translocations, with high initial emigration resulting in a small founding population.

The future of the sea otter colony at San Nicolas Island is uncertain. The colony has exhibited a pattern of early emigration and subsequent growth that appears to be roughly intermediate between the patterns seen after translocations of northern sea otters to Washington and Oregon. Although these translocations had similar beginnings, they had very different outcomes (Figure 6). While the Washington population has grown to a relatively large size (about 1,073 animals in 2008; Jameson and Jeffries 2009), the Oregon population has gone extinct.

The size of the San Nicolas Island population has remained far below that projected under the translocation plan. Like other small populations, the colony at San Nicolas Island is vulnerable to the effects of demographic and environmental variability.

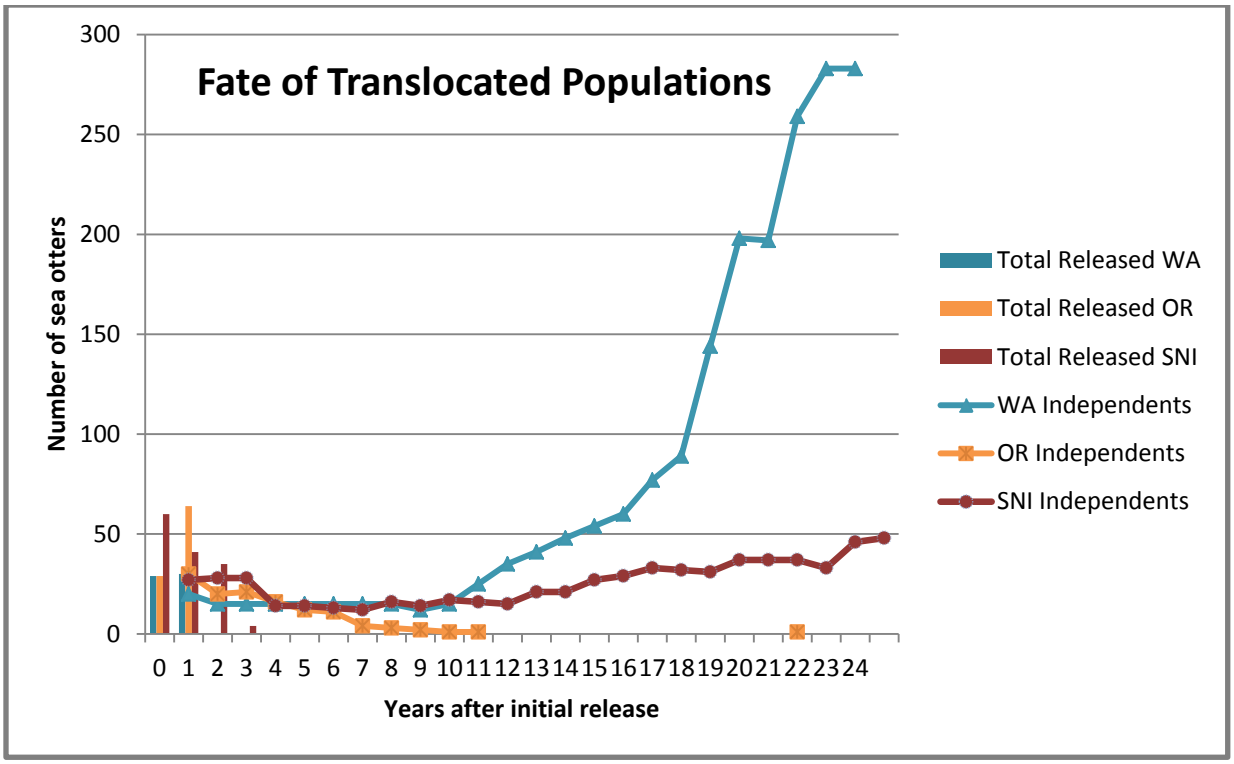

FIGURE 6. FATE OF TRANSLOCATED POPULATIONS IN WASHINGTON, OREGON, AND CALIFORNIA

These sources of unpredictability make it difficult to forecast the future of the colony based on existing trends or the example of other translocated populations. One important distinction must also be made between this and all earlier translocations: the designation of a management zone is unique to the San Nicolas Island translocation. Should the colony at San Nicolas Island survive, efforts to maintain a management zone will impede population growth if animals straying from the island are consistently removed from the population.

GOALS AND OBJECTIVES OF THE SOUTHERN SEA OTTER TRANSLOCATION PROGRAM

The goals identified in the 1987 Southern Sea Otter Translocation Plan are: (1) to recover the southern sea otter from its present "threatened" status under the ESA; and (2) to gain a better understanding of characteristics of a sea otter population and the marine ecosystem when the sea otter population is within range of its optimum sustainable population, as defined by the MMPA. Research associated with the translocation was designed to achieve the following objectives: (1) to understand southern sea otter population dynamics, in particular growth-limiting factors; (2) to understand the ecology of southern sea otter foraging and the role of southern sea otter predation in biological communities in central and southern California waters; (3) to develop methods for translocating southern sea otters; and (4) to evaluate and develop methods for containing southern sea otters. This research was undertaken in the context of competing management demands: to protect and conserve southern sea otters, on one hand, and to understand and manage conflicts between sea otters and shellfish fisheries on the other. These were the principal forces behind the joint management/research translocation program

put in place in 1987 under the auspices of the ESA, NEPA, and P.L. 99-625. To date, we have gathered a significant amount of data to assess capture, transport, reintroduction, and containment techniques. However, our primary recovery objective for the southern sea otter translocation program remains unfulfilled.

In the context of the goals stated in the southern sea otter translocation plan, the creation of an established southern sea otter population at San Nicolas Island does not appear to be achievable. The plan defines an "established" population as one that is not only reproductively self-sustaining but allows for the repeated removal of individuals for the reestablishment of another southern sea otter population in the parent range should a catastrophic event occur in the parent range. The logic underlying this definition is explained in our final rule for the establishment of an experimental population of southern sea otters:

> The Service does not consider the mere presence of sea otters in the translocation zone an indication that a new population is established. If a catastrophic event were to decimate a portion of the parent population, it is possible that the relocated otters could be used to restore the damaged portion of the parent population; however, it would also likely eliminate the value of the new population to serve as a reserve colony for providing stock to restore subsequently damaged areas and it could eliminate the reproductive viability of the colony such that the remaining animals could not be self-sustaining. Therefore, to be considered established it must be a reproductively viable unit, capable of maintaining itself even if 25 animals are removed each year for 1 to 3 years or replacement yield is sufficient to maintain the experimental population at or near carrying capacity during the post-establishment and growth phase or carrying capacity phase for the purposes of repairing damage to the parent population [52 FR 29754; August 11, 1987].

Two circumstances make achievement of this objective unlikely. First, the future of the San Nicolas Island colony is uncertain. Its small population size makes it difficult to predict when or if the population will become "established." Second, if the San Nicolas Island colony does become "established" (with a population size of 150 southern sea otters and an annual recruitment of 20 animals), our experience with the translocation of southern sea otters to San Nicolas Island indicates that if a catastrophic event were to affect the parent population, it is unlikely that we would be able to reestablish a viable southern sea otter population by moving 25 animals from San Nicolas Island annually over a 3-year period. The high emigration apparently inherent in sea otter translocations and the small number of animals available to be moved would make it unlikely that a core population could become established in the damaged area.

Relation of the Translocation Program to Southern Sea Otter Recovery

The original Southern Sea Otter Recovery Plan (USFWS 1982) identified the need to establish one or more additional southern sea otter colonies through translocation in order to minimize the possibility that a major oil spill or series of smaller spills could jeopardize the species. The intent behind translocation was to enhance the

southern sea otter's range, population size, and resilience to perturbation (its capacity to tolerate disturbance and to restore itself). A slow rate of population growth, evident in the mid- to late 1980s, was viewed as inadequate to expand the southern sea otter range rapidly enough to ensure the survival of the species should a spill occur. These factors led to the development of the plan to establish a second colony of southern sea otters through translocation from the central coast of California to San Nicolas Island.

The Final Revised Recovery Plan for the Southern Sea Otter (USFWS 2003) identifies several factors that have altered the need and rationale for the translocation program. The change in recovery strategy is the result of direct and indirect experience gained since publication of the original recovery plan, including experience gained from the translocation program itself.

The revised recovery plan cites the 1989 Exxon Valdez oil spill in Prince William Sound, Alaska, as evidence that the San Nicolas Island colony is not sufficiently far from the parent population to serve as an adequate safeguard against simultaneous loss in the event of a catastrophic event, such as a large oil spill:

> The Exxon Valdez oil spill confirmed many of the worst fears about the consequences of such events. The spill was uncontrollable and spread over 670 linear kilometers (400 miles) in 30 days–an area greatly exceeding the present range of the sea otter in central California plus that of the translocated colony at San Nicolas Island. The distance over which oil rapidly spread during the Exxon Valdez disaster indicates that the translocated colony at San Nicolas Island could not provide a reasonable safeguard against an oil spill of this magnitude. Moreover, it is estimated that several thousand sea otters died in the Exxon Valdez oil spill (Garrott *et al.* 1993, DeGange *et al.* 1994), a number at least equaling and probably exceeding the present size of the California population. Efforts to save and rehabilitate oiled sea otters were of little or no value to the population (USFWS 2003).

The Deepwater Horizon oil spill of 2010 has since demonstrated the potential for releases of oil of a magnitude previously unimagined, even in the wake of the *Exxon Valdez* spill. The Deepwater Horizon spill released an estimated 4.9 million barrels of oil (of which about 800,000 barrels were captured by containment efforts), almost 19 times the amount of oil spilled during the Exxon Valdez disaster (about 261,905 barrels) (http://www.eoearth.org/article/Deepwater_Horizon_oil_spill).

The recovery plan cites the failure of the program to achieve the goal of establishing a second, self-sustaining population of southern sea otters that could be used as a source of animals to repopulate areas of the mainland range affected by a catastrophic event (USFWS 2003):

> Our final rule for the establishment of an experimental population of southern sea otters (52 FR 29754) described expected population growth at San Nicolas Island in terms of three basic stages: a transplant stage, an initial growth and reestablishment stage, and a postestablishment and growth stage. The transplant stage would end when the population was stabilized, with a

sufficient mix of healthy males and females totaling 70 animals (or the number of animals translocated, whichever was less). This stage was expected to require one or more years. The initial growth and reestablishment stage would end when the experimental population was established, with at least 150 animals and a minimum annual recruitment of 20 animals for at least 3 of the most recent 5 years. This stage was expected to require at least 5 to 6 years after stabilization of the population. The post-establishment and growth stage would end when the population reached carrying capacity, an estimated minimum of 280 (but as many as 400-500) animals. A minimum of 10 years was expected for the population to reach carrying capacity.

To date, more than two decades after translocation efforts ended, numbers of animals remain well below all the thresholds—even the initial "population stabilized" threshold—defined by the translocation plan (Figure 7).

The recovery plan states that maintenance of the management zone is inefficient and ineffective:

> Maintenance of a management or "no otter" zone using nonlethal means has proven costly and ineffective. Large numbers of otters (50-100 animals) have been observed frequenting the northern end of the

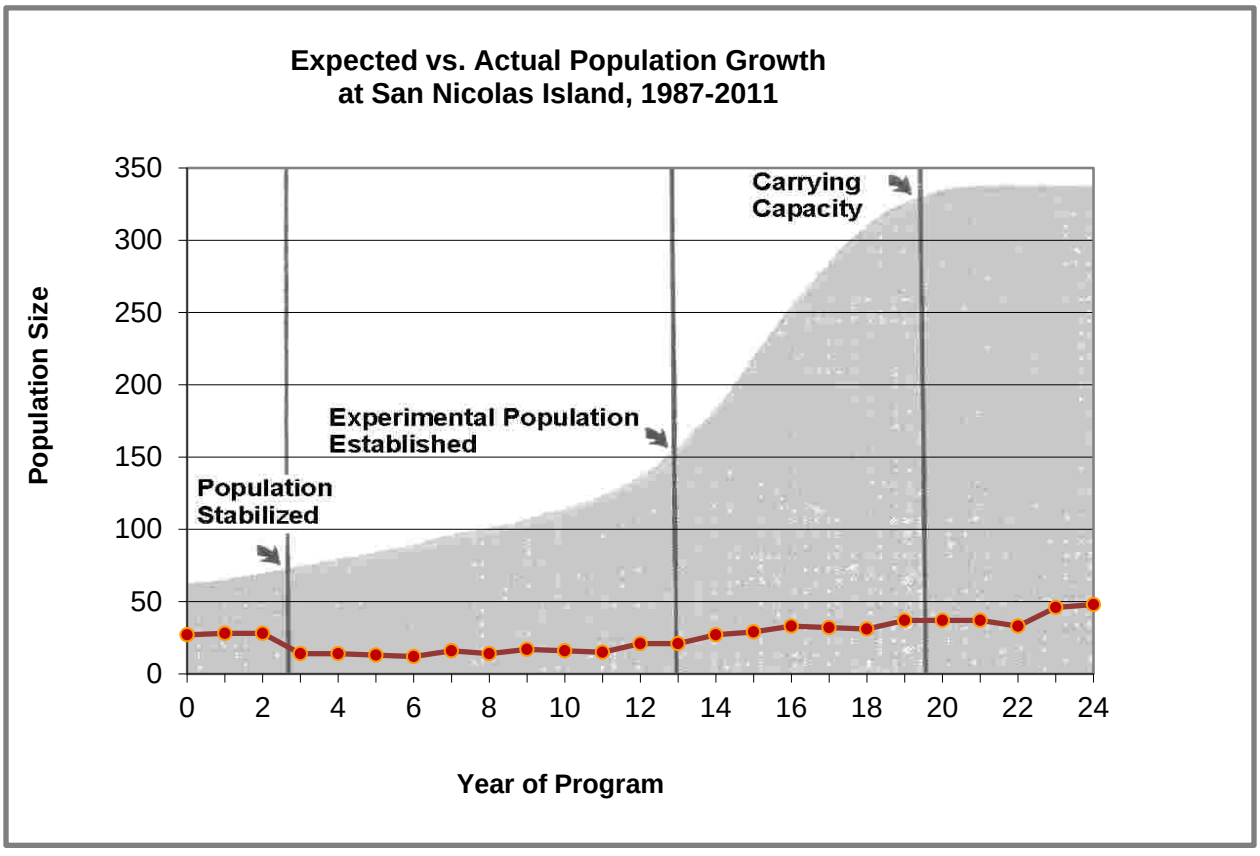

FIGURE 7. EXPECTED VS. ACTUAL POPULATION GROWTH AT SAN NICOLAS ISLAND

> management zone from 1998 to 2001. These animals appear to move into and out of the zone seasonally from areas along the mainland to the north. Because this movement of southern sea otters initially occurred at a time when the population counts were declining, it is clear that it did not occur as a result of the population increasing in size. Our experience to date indicates that sea otters removed from the management zone are capable of returning to it even after being moved more than 300 kilometers (200 miles). The rapidity with which southern sea otters can move throughout their range makes maintenance of a management zone difficult if not impossible.

Seasonal movements of large numbers of sea otters along the coastline near Point Conception continue into the present, with expansions and retractions of the range occurring regularly. Whereas the 2008 spring count recorded the presence of 37 sea otters east of Gaviota, most of them off Naples Reef near Coal Oil Point in Santa Barbara County, 2010 saw a retraction of the range to Gaviota State Park, where the range end has remained through 2012 (http://www.werc.usgs.gov/seaottercount). Radio-telemetry studies have revealed that these animals are moving great distances throughout the southern sea otter range and are an important component of the population (*i.e*, the same territorial males that hold territories and sire pups within the center of the range may be found seasonally aggregated in "male areas," often at the range ends) (Tinker 2002, unpub. data; Tinker *et al.* 2006). The capture and relocation of these sea otters exposes them to increased mortality and may result in widespread disruption of the southern sea otter population as a whole (USFWS 2000).

The recovery plan concludes that maintenance of a management or "no-otter" zone would hinder southern sea otter recovery:

> The Recovery Team believes that the primary action for promoting the recovery of the southern sea otter at this time should be the cessation of the management zone, and that without such a change in management, the likelihood of recovery will be significantly lessened due to the stress and social disruption of capturing animals and relocating them from the management zone.

Recent research has highlighted an additional connection between range expansion and recovery. Sea otters in at least a portion of the mainland range along the central California coast are strongly food-limited (Tinker *et al.* 2008). Expansion of the sea otter population into areas with greater prey abundance (*i.e.*, parts of their former range from which they have long been absent, such as southern California) will likely be necessary to support the population growth needed for recovery.

In sum, the revised recovery plan of 2003 acknowledges that the intent and purpose of the translocation program have not been met. Subsequent information has reinforced the findings of the recovery plan. The current strategy for recovering the southern sea otter, as stated in the revised recovery plan, is to determine causes of increased mortality in the parent population, to mitigate these causes, and to allow the number and range of southern sea otters to

increase naturally to such a size that: (1) there will be enough survivors to recolonize the range without genetic bottleneck effects in the event of a major oil spill in central coastal California; and (2) a declining trend in abundance can be detected with adequate statistical assurance prior to the population reaching the threshold for endangered status. Continuation of zonal management may result in the direct deaths of individual animals removed from the management zone and disrupt social behavior in the parent population to a degree that animals residing in the range of the parent population will have a reduced potential for survival and recovery. Zonal management will also artificially restrict the range of the southern sea otter and perpetuate the species' vulnerability to the adverse effects of oil spills, disease, food limitation, and stochastic events.

SEA OTTER CONTAINMENT

Our experience implementing the translocation program revealed that detecting and confirming the presence of sea otters in the management zone was more difficult in practice than in theory. Because of the large area involved [more than 750 linear miles (1,200 km) of coastline] we were dependent on fishermen, local residents, and others to provide reports of sea otter sightings. The quality of such reports varied considerably, and at times the presence of animals could not be verified despite multiple reported sightings. At other times, a sea otter sighting was confirmed, but the animal left the area before a capture attempt could be organized.

Capture operations were also more complicated than anticipated. Sea otter captures in the management zone most often involved divers using Wilson traps and closed-circuit rebreathers in place of conventional SCUBA equipment. This capture technique proved to be effective but labor intensive, and success was largely dependent on the skills of individual divers (Sanders and Wendell 1991). Initially, we expected that this technique would be sufficient to maintain the management zone free of sea otters, but we did not account for the decrease in efficiency that occurred when the targets of capture operations were small numbers of sea otters spread over hundreds of miles of coastline. The logistical arrangements necessary to mount a capture operation were considerable regardless of how many sea otters were being targeted. Often the target of an operation was a small group of sea otters or even a single individual. If the capture attempt failed, there was little recourse but to wait for another opportunity once the animal(s) settled down. In contrast, when we captured sea otters for translocation to San Nicolas Island, we had access to large numbers of sea otters that offered multiple capture opportunities. If one group of sea otters dispersed, capture efforts could be easily shifted to another group nearby.

In addition to underestimating the difficulties involved in capturing sea otters, we underappreciated their physical capabilities and drive to return to their home range. It is clear that the deep ocean channels surrounding San Nicolas Island did not pose a barrier to sea otter movements as we initially believed they would. We now know, based on the resightings of translocated sea otters in the mainland range of the parent population and the return of southern sea otters removed from the management zone, that southern sea otters are eminently capable of traversing long distances and navigating to the areas where they were originally captured.

Despite the fact that capture operations in the management zone were arduous and

relatively ineffective, the potential for harm to the animals themselves was ever-present. At least four southern sea otters died within two weeks of being removed from the management zone and released in the mainland range of the parent population. Although one animal was a very old male, as evidenced by his tooth wear, body size, and general condition, and one animal was a dependent pup transported with its mother, the other two were young, prime-aged animals in good health at the time of capture. We were unable to determine the precise cause of death in these animals, but we are concerned that their capture and relocation was a significant factor. We surmise that these animals, captured in areas with low southern sea otter densities and rich food resources, were unable to survive when released in unfamiliar areas with moderate southern sea otter densities and relatively sparse food resources. In light of the stress-related deaths of southern sea otters captured for translocation to San Nicolas Island, we cannot discount the possibility that the individual susceptibilities of sea otters to stress may have also played a role in these mortalities.

Assessment of Failure Criteria Identified in Translocation Plan

Public Law 99-625 authorized southern sea otter translocation and provided requirements for a southern sea otter translocation plan should we pursue the creation of a translocation program. The statute did not address the possibility of the program's failure. As a consequence, it did not specify criteria that would be used to determine whether the program had failed, nor did it recommend actions that should be taken in the case of failure. When we developed the translocation plan and implementing regulations for the program, we received public comment asking us to define what constituted failure of the program and what actions we would take if the program failed. We responded by delineating specific failure criteria in the 1987 Translocation Plan [52 FR 29754; August 11, 1987].

The purpose of the failure criteria was to identify circumstances under which we would generally consider the translocation program to have failed. The five failure criteria were defined before any translocations of southern sea otters were undertaken and without the benefit of what we know today about the translocation, containment, and recovery needs of southern sea otters. The criteria focus on the status of the translocated population and, in hindsight, clearly do not address all the circumstances that are relevant to a complete evaluation of the program. For example, the failure criteria do not address the possibility that containment might not be successfully accomplished because of southern sea otters entering the management zone from the mainland range of the parent population rather than from the experimental population at San Nicolas Island. The failure criteria also do not address the possibility that the founding population of the San Nicolas Island colony might be fewer than 70 animals, or even the possibility that an "established" population at San Nicolas Island, defined in our regulations, may be insufficient to attain the recovery goals established for the program. We believe that, ultimately, failure is determined by our ability or inability to attain the recovery objectives of the translocation program, which are clearly set out in our final rule for the establishment of an experimental population of southern sea otters [52 FR 29754; August 11, 1987].

In this final evaluation of the southern sea otter translocation program, we find that the translocation program meets failure criterion

2 as defined in the original 1987 translocation plan. A summary of our analysis of each failure criterion is given below.

> Criterion 1: *If, after the first year following initiation of translocation or any subsequent year, no translocated otters remain within the translocation zone, and the reasons for emigration or mortality cannot be identified and/or remedied;*

Criterion 1 has not been met. Sea otters have been observed in the translocation zone at San Nicolas Island every year since the beginning of the program.

> Criterion 2: *If, within three years from the initial transplant, fewer than 25 otters remain in the translocation zone and the reason for emigration or mortality cannot be identified and/or remedied;*

Criterion 2 has been met. The initial transplant occurred in August 1987. Within 3 years of the initial transplant (August 1990), a maximum of 17 sea otters (14 independent animals and 3 pups) resided in the translocation zone.

We chose to delay declaring the translocation program a failure in 1990 because southern sea otters were reproducing, dispersal into the management zone had abated, and the California Department of Fish and Game expressed a desire to continue zonal management of southern sea otters. Although sea otters at the island continue to reproduce, the colony remains small; dispersal of sea otters from the parent range into the management zone is now regularly occurring; and the California Department of Fish and Game informed us in 1997 that it would no longer be able to assist us if we resumed capturing sea otters in the management zone.

We consider emigration from SNI to be the primary reason for the small size of the population (17 sea otters, including pups) remaining at the island within three years of the initial transplant. Fifty-four (54) translocated sea otters were later detected elsewhere (either back in the mainland range or in southern California waters). The number of sea otters resighted in the mainland range (36), despite the absence of a focused effort to identify them there (efforts were focused instead at SNI and in the management zone), suggests that additional sea otters may have returned without being detected. There is some evidence of sea otter mortality at SNI (three sea otters were found dead at SNI within days of being translocated), but no additional deaths of translocated sea otters at SNI were verified. Of the animals that remain unaccounted for, it seems likely that most either emigrated successfully and escaped further detection or attempted to emigrate but died before reaching suitable habitat.

Although high rates of dispersal had been seen in all earlier sea otter translocations (Estes *et al.* 1989), we believed that the translocation to San Nicolas Island would not result in the significant dispersal of animals because of the abundance of prey items, the apparent suitability of the habitat, and the perceived barrier imposed by the surrounding deep water. After the first year of translocation, we made significant changes to the program with the intent of minimizing or eliminating emigration [53 FR 37577; September 27, 1988]. These changes were implemented during the second year of the program, when we selected younger sea otters for translocation, transported sea otters more quickly and in

smaller groups, abandoned the use of holding pens at the island, and released newly translocated sea otters in the vicinity of sea otters already residing at the island. Despite our efforts, none of these changes appeared to result in a decrease in emigration. In the final year of the translocation effort, we attempted to gain more information on sea otter movements by implanting radio transmitters in sea otters immediately prior to their transport to San Nicolas Island. Two of the initial three southern sea otters that received implants died before they could be transported to the island, causing us to abandon this effort.

We conclude that the translocation program has failed under criterion 2. We believe that emigration from SNI is the primary reason that substantially fewer than 25 otters remained in the translocation zone within three years of the initial transplant. Although we modified the program significantly after the first year in an attempt to reduce emigration and otherwise reduce sea otter mortality associated with the program, we were unable to remedy the situation. Therefore, failure criterion 2 has been met.

The fact that the translocation program has failed under criterion 2 does not necessarily mean that the sea otter colony at San Nicolas Island is destined to disappear. In fact, it appears to have a low cumulative probability of extinction (Carswell 2008). However, the final rule establishing the program clearly states, "The Service does not consider the mere presence of sea otters in the translocation zone as an indication a new population is established" [52 FR 29754; August 11, 1987]. The colony would be considered "established" when at least 150 southern sea otters resided at the island and the population had a minimum annual recruitment of 20 animals [52 FR 29754; August 11, 1987]. The initial high rate of dispersal of translocated sea otters from San Nicolas Island is the primary cause of failure under this criterion not only because of its direct effect on the subsequent size of the San Nicolas Island colony, but also because of its implications for the recovery strategy at the heart of the program: the intended function of the San Nicolas Island population as a self-sustaining "reserve colony for providing stock to restore subsequently damaged areas" in the southern sea otter's range [52 FR 29754; August 11, 1987]. The high rate of dispersal of translocated sea otters suggests it is unlikely that the colony will ever be large enough to supply the numbers of sea otters necessary to perform a successful translocation and re-establishment of population in the mainland range if the parent population were reduced or eliminated by a catastrophic event.

Criterion 3: *If, after two years following the completion of the transplant phase, the experimental population is declining at a significant rate, and the translocated otters are not showing signs of successful reproduction (i.e. no pupping is observed); however, termination of the project under this and the previous criterion may be delayed, if reproduction is occurring, and the degree of dispersal into the management zone is small enough that the effort to remove otters from the management or no-otter zone would be acceptable to the Service and the affected State;*

We are unable to evaluate whether the program has failed under criterion 3 because we never reached the minimum number of sea otters at San Nicolas Island required to complete the transplant phase of the program. The translocation plan defines the transplant phase as ending when there are at least 70 healthy southern sea otters of mixed

ages and sexes within the translocation zone and we determine that the population is increasing due to natural reproduction. Although we translocated twice this number, we never achieved the requisite core population of 70 animals.

From a practical perspective, however, the transplant phase ended when the last sea otter was translocated to the island in 1990. The population declined at a significant rate from the program's inception in 1987 to 1993, at which time the number of independent sea otters at the island was 12. Although pups were observed from 1987 to 1993, there appeared to be little or no recruitment into the population. The 15 sea otters at the island in 1993 (12 independent animals and 3 pups) were fewer than the minimum number (25) required to avoid a declaration of failure under failure criterion 2; however, under provisions of failure criterion 3 we could delay termination of the program because pupping was occurring and dispersal of translocated sea otters into the management zone had abated.

The experimental population has fluctuated in number since 1993 and now appears to be increasing overall; reproduction continues to occur. Although pupping is occurring, it is not certain that the San Nicolas colony will persist. If it does persist, it will have been founded on a small subset of the core number of 70 healthy sea otters of mixed ages and sexes that were intended to found the population, a fact that has implications for the genetic makeup of the resulting population. The current rate of emigration from the island is unknown, but we now know that the deep ocean channels surrounding the island do not present a barrier to dispersal.

Criterion 4: *If the Service determines, in consultation with the affected State and the Marine Mammal Commission that sea otters are dispersing from the translocation zone and becoming established within the management zone in sufficient numbers to demonstrate that containment cannot be successfully accomplished. This standard is not intended to apply to situations in which individuals or small numbers of otters are sighted within the management zone or temporarily manage to elude capture. Instead it is meant to be applied when it becomes apparent that, over time (one year or more), otters are relocating from the translocation zone to the management zone in such numbers that: 1) an independent breeding colony is likely to become established within the management zone or 2) they could cause economic damage to fishery resources within the management zone. It is expected that the Service could make this determination within a year, provided that sufficient information is available;*

Technically, criterion 4 has not been met. This criterion clearly specifies that the program would be declared a failure if sea otters moved from the *translocation zone* and became established in the management zone. The criterion does not strictly apply if animals immigrate into the management zone from the *parent range*. Nevertheless, beginning in 1998, large groups (50 to 150 individuals) of sea otters have seasonally moved into the management zone from the parent range. Since 2006, monthly surveys have counted an average of 40 otters with considerable variation over time (standard deviation of +/- 19) (K.D. Lafferty, USGS, pers. comm. 2011). During the 2012 spring census, 10 pups were counted southeast of Point Conception, suggesting that a permanent breeding colony has likely been established in the management zone

(http://www.werc.usgs.gov/seaottercount). Commercial fishing interests contend that local shellfish populations available to the fishery have been reduced by the presence of these sea otters.

The difficulties associated with sea otter capture and transport, our concern for the welfare of animals removed from the management zone, the adverse effects of sea otter containment on the parent population, and the adverse effects on fisheries are concerns regardless of whether sea otters enter the management zone from the parent range or from San Nicolas Island. Although criterion 4 is specific and applies only to sea otters originating from San Nicolas Island, our experience with sea otters entering the management zone from either the parent range or the translocation zone indicates that successful containment of sea otters, or maintenance of an "otter-free" management zone, cannot be accomplished by simply capturing animals in the management zone and moving them to another location.

Criterion 5: *If the health and well-being of the experimental population should become threatened to the point that the colony's continued survival is unlikely, despite the protection given to it by the Service, State and applicable laws and regulations. An example would be if an overriding military action for national security was proposed that would threaten to devastate the colony and the removal of otters was determined to be the only viable way of preventing loss of the colony.*

Criterion 5 has not been met. The experimental population at San Nicolas Island, although small and vulnerable, has persisted. There are no proposed Federal, State, or local actions that threaten to devastate the colony. The Department of Defense is responsible for the majority of human activity at San Nicolas Island. They have conferred with us and given consideration to southern sea otters when developing projects at San Nicolas Island. To date, no projects have posed a threat to the colony.

Conclusion

We therefore conclude that the translocation program has failed under Criterion 2. Criterion 3 cannot be evaluated. Criteria 1, 4, and 5 have not been met.

The primary purpose of the southern sea otter translocation program was to advance southern sea otter recovery, with the ultimate goal of delisting the species. Based on a broader evaluation of the translocation program against the goals for which it was undertaken and current recovery goals, in concert with the failure criteria established for the program's assessment, we again conclude that the translocation program has failed. It has failed to fulfill its purpose, and our recovery and management goals for the species cannot be met by continuing the program.

The San Nicolas Island sea otter colony is small, and its future is uncertain. Even if the colony were to become established, the resulting population would not likely be sufficient to ensure survival of the species should the parent population be adversely affected by a widespread catastrophic event. Recovery of the southern sea otter will ultimately depend on the growth and expansion of the southern sea otter's range. Although we recognize that there are conflicts between an expanding sea otter population and fisheries that have developed in the absence of sea otters, zonal management of sea otters has proven to be ineffective and compromises the ability of the species to recover.

Glossary

carrying capacity: the point at which the population reaches a state in which the numbers of animals remain relatively constant and in balance with the available food supply (estimated as a minimum of 280 animals for San Nicolas Island, but believed to be as high as 400-500 animals)

established population: a translocated population at San Nicolas Island that meets the following criteria: (1) an estimated combined minimum of 150 healthy male and female sea otters residing within the translocation zone; (2) little or no emigration into the management zone occurring; and (3) minimum annual recruitment of 20 sea otters

experimental population: any southern sea otter found within the translocation zone or the management zone

failure determination: a determination that the translocation program has failed to produce a viable, contained experimental population at San Nicolas Island based on an evaluation of specific failure criteria given in 50 CFR § 17.84 (d)(8)

management zone: an area from Point Conception to the Mexican border that surrounds the translocation zone and from which sea otters are required to be non-lethally removed (as long as a translocation zone exists) according to the provisions of PL 99-625

parent population: the population of southern sea otters existing along the central California coast north of the management zone

Public Law 99-625: a law enacted on November 7, 1986 authorizing the translocation of southern sea otters and requiring the specification of a translocation zone and a management zone as part of any proposed translocation plan

translocation zone: the area surrounding San Nicolas Island within which the experimental population of southern sea otters was released and is required to be contained

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Appendix D: Final Rule and Record of Decision on the Translocation of Southern Sea Otters (52 FR 29754; August 11, 1987)

federal register

Tuesday
August 11, 1987

Part II

Department of the Interior

Fish and Wildlife Service

50 CFR Part 17

Endangered and Threatened Wildlife and Plants; Establishment of an Experimental Population of Southern Sea Otters; Final Rule and Record of Decision

DEPARTMENT OF THE INTERIOR

Fish and Wildlife Service

50 CFR Part 17

Endangered and Threatened Wildlife and Plants; Establishment of an Experimental Population of Southern Sea Otters

AGENCY: Fish and Wildlife Service, Interior.

ACTION: Final rule.

SUMMARY: The U.S. Fish and Wildlife Service (Service) issues a final rule governing a reintroduction of southern sea otters (*Enhydra lutris nereis*) at, and containment of them in the immediate vicinity of, San Nicolas Island, Ventura County, California for two purposes: (1) To implement a primary recovery action for a federally listed "threatened" species, and (2) to obtain data for assessing translocation and containment techniques, population dynamics, the ecological relationships of sea otters and the nearshore community, and the effects on the donor population of removal of individual otters for translocation. This experimental population will be established and managed under the authorities and guidelines of Pub. L. 99–625, 100 Stat. 3500 (1986).

EFFECTIVE DATE: This rule becomes effective on August 11, 1987.

ADDRESSES: The complete file for this rule is available for inspection, by appointment, during normal business hours at the U.S. Fish and Wildlife Service, Lloyd 500 Building, 500 NE. Multnomah Street, Suite 1650, Portland, Oregon 97232, or the Office of Sea Otter Coordination, Room E–1818, 2800 Cottage Way, Sacramento, California 95825.

FOR FURTHER INFORMATION CONTACT: Mr. Wilbur Ladd, U.S. Fish and Wildlife Service, Office of Sea Otter Coordination, Room E–1818, 2800 Cottage Way, Sacramento, California 95825 (916/978–4873) or FTS: 460–4873.

SUPPLEMENTARY INFORMATION:

Background

Species Account

The Secretary of the Interior determined in 1977 (42 FR 2968, January 14, 1977) that the southern sea otter (*Enhydra lutris nereis*) was a threatened species for purposes of the Endangered Species Act (ESA), as amended (16 U.S.C. 1531 *et seq*). Contributing to this determination was the fact that the historic sea otter population was reduced to near extinction due to commercial fur harvesting in the 1700's and 1800's. The southern sea otter (also referred to as California sea otter) presently numbers 1,300–1,400 animals and ranges from Año Nuevo, Santa Cruz County, to the Santa Maria River, San Luis Obispo County, California. Although the California population and its range has significantly increased since Federal and State bans on commercial and other hunting in 1911 and 1913, respectively, the still small population size and range, about 10 percent of historical California levels, and the otter's vulnerability to oil contamination warrant a threatened classification.

The sea otter, unlike most marine mammals, does not have blubber to provide insulation from the chilling effect of the ocean. The otter's dense pelage provides insulation and, if matted by oil or some other contaminant, the insulation is effectively eliminated and animals may die from hypothermia. The 1977 listing recognized that substantial quantities of petroleum products are shipped along the California coast, moving near the southern sea otter range, and are also transferred at marine terminals near the northern and southern ends of the range. Oil tanker traffic was and still is believed to pose the greatest oil spill risk to sea otters, although offshore outer continental shelf (OCS) oil development is currently increasing the oil spill risks. This latter risk was not a consideration when the species was listed as threatened in 1977.

In 1976, the California Department of Fish and Game (CDFG) estimated that the population numbered close to 1,800 and was increasing annually at about 5 percent. Recent information, however, indicates that the population has not grown significantly at least since the mid-1970's and may have declined somewhat over the past 10 to 15 years. As determined through studies started in 1982, this lack of growth is most likely attributable to sea otters becoming accidentally entangled and drowning in large-mesh gill and trammel nets set in nearshore waters by the local halibut fishery. CDFG biologists estimated that an average of 80 sea otters drowned annually between 1982 and 1984 and that losses ranged from 49 to 168 per year between 1973 and 1984. This threat to the population was neither recognized nor considered in the 1977 determination. The State of California has twice recently enacted legislation designed to substantially reduce or eliminate the accidental drowning of sea otters in large-mesh gill and trammel nets.

The status of southern sea otters was reviewed in the Service's 5-year review (May 1984). The review recognized the deteriorated state of the population (i.e., no growth and possibly a decline over the past 10 to 15 years, and activities in the area that can influence the population including OCS oil and gas development and incidental drowning in gill and trammel set nets) and the importance of moving rapidly forward with the major recovery tasks, including establishment of at least one additional population.

Pursuant to the ESA and Marine Mammal Protection Act (MMPA), the Service must utilize its authorities to recover the southern sea otter. The Service developed a recovery plan for the southern sea otter that was approved in 1982. This plan addresses the Service's responsibilities specifically under ESA and more generally under the MMPA. It examines possible means to protect and restore the southern sea otter and concludes that, along with completing the other recovery plan tasks, the most effective means of recovering the population is to establish at least one new colony sufficiently removed from the present range such that a large-scale oil spill could not contact both the new colony and existing population simultaneously.

For purposes of ESA the Service believes present population growth characteristics are inadequate for natural recolonization of historical, albeit not all, habitat within a reasonable period. Therefore, the Service is planning to establish at least one colony within historical range, in an area that is abundant with prey, kelp, and other habitat requirements, relatively free of toxic pollution, and sufficiently distant from the existing range so that a catastrophic oil spill will not likely contact both the existing population and the new colony of southern sea otters.

The Service contracted with James Dobbin Associates, Inc. in 1981 to map the location of and compile ecological and socioeconomic data for potential translocation zones along the Pacific coast of Washington, Oregon and California. Based on a variety of criteria, four coastal zones were delineated as having the highest potential for successful translocations: Northern Washington; southern Oregon; northern California; and San Nicolas-Santa Barbara Islands, southern California. For reasons discussed more fully herein, San Nicolas Island is considered the preferred site.

Summary of Major Issues, Comments and Recommendations

The Proposed Rule was submitted for public review concurrently with a Draft

Environmental Impact Statement (DEIS) on the proposed translocation. The Proposed Rule was published in the **Federal Register** on August 15, 1986, at which time all interested parties were invited to comment on the proposal during the comment period that extended through November 17, 1986. Commentors were advised that two separate documents were being made available for their review and that comments should be submitted on each of them. Only a few agencies, individuals and organizations identified comments as being specific to the Proposed Rule; however, many comments were received on certain aspects of the DEIS, such as the translocation plan (Appendix B), that were also pertinent to the Proposed Rule. This summary of comments has, therefore, been developed to address the major issues and concerns raised and recommendations made during the comment period, regardless if the comments were identified as being specific to the Rule, as long as the concern was pertinent to the Rule as well as to the DEIS. There were numerous comments received that were not considered to be major that are not discussed in the major issues below. Readers are referred to the Final EIS (FEIS) for specific responses to all comments received on the DEIS, including comments that are pertinent to both the Rule and DEIS but were not specifically directed to the Proposed Rule itself. A typed and signed copy of the Proposed Rule was incorporated into the DEIS as Appendix C, and was also distributed under separate cover after being published in the **Federal Register** on August 15, 1986.

Appropriate State and Federal agencies, County governments, representatives of scientific organizations and institutions and other interested parties were provided copies of the DEIS and Proposed Rule and requested to comment. A paid notice was published once during the week of August 24, 1986, in newspapers of general circulation in the areas potentially affected by the proposal; these included the following:

Coos Bay–North Bend World; Coos Bay, OR
Eugene Register–Guard; Eugene, OR
Eureka Times Standard; Eureka, CA
Ukiah Journal; Ukiah, CA
San Luis Obispo Telegram-Tribune; San Luis Obispo, CA
San Francisco Chronicle; San Francisco, CA
Monterey Peninsula Herald; Monterey, CA
Santa Cruz Sentinel; Santa Cruz, CA
The Press-Courier; Oxnard, CA
Los Angeles Times; Los Angeles, CA
Star Free Press; Ventura, CA

In addition to the paid advertisements, the Service sent a general news release on the proposal, the availability of the DEIS and Rule, and information on public hearings to approximately 500 other newspapers, radio stations, television stations and organizations in California and Oregon to further ensure that the public was aware of the Service's proposal. Three public hearings were conducted to provide additional opportunity for public comments on the proposal. The hearings were held in Ventura (September 24, 1986) and Monterey, California (September 22, 1986); and Brookings, Oregon (September 17, 1986). Approximately 435 people attended the hearings, and 97 provided testimony. Fifty-four of the 97 individuals who testified did not submit written comments (tallied below).

During the 94-day comment period, 953 (written) comment letters were received on the DEIS and Proposed Rule. Few commentors identified their comments as being specific to the Proposed Rule, but many comments on the DEIS were also applicable to the Rule and, thus, were considered in preparing both the FEIS and Final Rule. Of the 1,007 individuals and organizations that submitted oral or written comments on the proposal, 821 (81.5 percent) were in support, 140 (13.9 percent) opposed and 46 (4.6 percent) were neutral. We received one petition with 2,169 signatures that expressed concern that translocation to San Nicolas Island would jeopardize the diversity of the shellfish ecosystem throughout the Channel Islands and urged immediate zonal management. Of the 15 Federal and State agencies that commented on the proposal, two expressed support, including the Marine Mammal Commission which strongly supported the proposal and urged implementation in 1987, and 13 neither supported nor opposed the proposal, but offered comments and recommendations for consideration in preparing the Final Rule and FEIS. One elected California official expressed concern about the economic impact of the proposal on fisheries, and concluded that the potential adverse impact on the southern California sport and commercial fisheries resulting from a translocation to San Nicolas Island far outweighs the benefits to the southern sea otter. The California Resources Agency (Department of Fish and Game) in general supports recovery actions for the southern sea otter but indicated that before the Department could support this specific plan for translocation, the management zone boundary would have to be moved from Point Conception north to Point Sal or at least a "buffer" would have to be established between Point Sal and Point Conception where otter numbers could be kept low to facilitate restricting southward range expansion of the existing population beyond Point Conception.

After analysis of the comments received, the FEIS, with an attached draft final rule; was published on May 8, 1987. The rule has been widely publicized and the public is well aware of the narrow window of opportunity, beginning in mid-August, during which field activities must take place. If activities cannot begin near the outset of this narrow window, the entire project is likely to be delayed for 1 year, thus adversely affecting southern sea otter recovery.

Comment 1: Management of the existing population of California sea otters is not addressed in the translocation plan.

Service Response: The translocation plan has been prepared to comply with requirements set forth in Public Law (Pub. L.) 99–625, special legislation enacted in November 1986 which specifically authorizes and establishes requirements for translocating California sea otters. Legislative history of Pub. L. 99–625 states that the translocation plan is to provide for implementation of an important component of the Recovery Plan and that, while addressing a number of general issues related to the long-term management of California sea otters, it is primarily a planning mechanism for the translocation itself. It further states that specifications concerning long-term management of the California sea otter, including establishment of recovery goals and future translocation needs should be addressed in its next update of the Recovery Plan. The translocation plan, according to Congress, is not intended to replace the Recovery Plan as the primary long-term management document. The Service has committed to initiating a long-term management plan for the existing population immediately following the decisionmaking process on translocation. Implementation of the translocation plan will, however, constitute a form of "zonal management" involving the existing population. This will occur as a result of designating the entire Southern California Bight, from Point Conception south to Mexico including all offshore islands except San Nicolas, Begg Rock, and the translocation zone as a "no-

otter" zone. This designation will result in preventing the existing population from reoccupying historical habitat south of Point Conception through natural range expansion. In the absence of the translocation to San Nicolas Island, no such "no-otter" zone or other population management scheme is contemplated in the foreseeable future for the existing population, which is expected to expand into the Southern California Bight within the next 10–20 years without such a program.

Comment 2: The translocation plan contains insufficient detail regarding the relationship of the translocation to ESA section 7 determinations, including criteria for an "established population", as required by Pub. L. 99–625.

Service Response: The translocation plan adequately addresses all of the requirements and the intent of Pub. L. 99–625. The plan provides detailed guidelines, criteria, milestones and assumptions the Secretary will utilize in making jeopardy or non-jeopardy determinations under section 7 of the ESA. It specifically addresses how the experimental population will be factored into the section 7 analysis at various growth stages after the initial translocation of otters is undertaken. The description points out, however, that the status of the parent population will be a major factor considered in the outcome of any section 7 consultation involving either the parent or experimental population. The translocation plan also contains a specific definition for an "established experimental population" that takes into account its size, productivity, dispersal tendency, sex composition and general health. The plan describes how this definition relates to consideration of projects through the section 7 process.

Comment 3: The translocation plan contains insufficient detail regarding relationship of translocation to the overall status and recovery of the sea otter, as required by Pub. L. 99–625, and insufficient discussion of other delisting criteria.

Service Response: The translocation plan, section on the Relationship of Translocation to the Overall Status of the Southern Sea Otter, provides clarification of recovery criteria, including an example of a scenario that would represent a recovered population. It addresses future translocation needs for recovery purposes by indicating that the initial translocation could be sufficient if it resulted in a successfully established population (based on specific criteria), the parent population is showing sustained growth in size and range and the other Recovery Plan criteria were met. The example presented further defines an approach to achieving recovery goals. To go beyond what is now contained in the translocation plan would be inconsistent with the statements in the Congressional Record (131 Cong. Rec. H6468, July 29, 1985) that "The translocation plan is to provide for the implementation of an important component of the Recovery Plan. While addressing a number of general issues related to the long-term management of California sea otters, it is primarily a planning mechanism for the translocation itself. Specifications with respect to long-term management of the California sea otter, including establishment of recovery goals and future translocation needs, should also be contained in the Recovery Plan for the California sea otter. The Fish and Wildlife Service is expected to address these aspects in its next update of the Recovery Plan. The translocation plan itself, while discussing these issues, is not intended to replace the Recovery Plan as the primary long-term management document." This interpretation was reaffirmed by Senator Cranston in remarks made during Senate consideration of H.R. 4531 which was enacted as Pub. L. 99–625. *See* 132 Cong. Rec. Section 17322 (October 18, 1986).

The plan also specifies that a delisting review would be initiated upon the new population meeting the criteria for "establishment." The plan has been modified to reiterate the additional recovery criteria that must be achieved in order to consider delisting, and the five factors that must be evaluated during any consideration of delisting.

Comment 4: The translocation plan suggests that additional translocations may be needed to remove excess otters from the San Nicolas translocation or management zones or from the existing population for recovery purposes. The Service has not identified the locations of these additional translocation sites or under what circumstances additional translocations would be needed, nor has it evaluated the environmental and socioeconomic consequences of subsequent translocations.

Service Response: The translocation plan suggests that moving excess otters from the translocation or management zone to other unoccupied sites as the experimental population approaches carrying capacity would be one of several possible options to prevent significant dispersal from the zone, which could increase the problem of maintaining the management zone free of otters. Public Law 99–625 requires that otters removed from the management zone be placed either in the range of the existing population or into the translocation zone. If additional translocation sites are needed in the future, any proposal for additional translocations would have to comply with National Environmental Policy Act procedures. It is too speculative to consider at this time the sites that may be considered in the future because environmental and socioeconomic conditions may change significantly in the future. With regard to additional translocations from the existing population for recovery purposes, the Congressional Records of July 29, 1985, and October 18, 1986, respectively, state that the translocation plan is primarily a planning mechanism for the translocation itself and that future translocation needs should be addressed in the next update of the Recovery Plan.

Comment 5: The size of the translocation zone is too large; it should only include waters out to the 15-fathom isobath, which includes the normal habitat of otters. Furthermore, the size of the zone should be reduced or eliminated in the future if oil spill response capability is established in the immediate vicinity of San Nicolas Island.

Service Response: Public Law 99–625 requires that the translocation zone be defined to include the normal habitat of the sea otter plus a buffer area to insulate the experimental population from the adverse effects of activities that may occur outside of the translocation zone. In delineating the buffer area, Congress has indicated the Service should take into account factors such as wind and wave patterns, offshore currents and other oceanographic variables, as well as the type and magnitude of the activities that may adversely affect the experimental population. The translocation plan and Rule define normal sea otter habitat as all nearshore waters surrounding San Nicolas Island and Begg Rock out to a depth of 15 fathoms. The types of activities identified that may adversely affect the experimental population included incidental entanglement in large-mesh gill and trammel set nets and activities that could result in accidental oil spills, e.g., OCS oil development and tankship accidents. The buffer area was then delineated based on the estimated time it would take to respond, with existing response equipment that is based on Santa Barbara, and to control or divert an oil spill occurring at the perimeter of the zone before it moved into 15-fathoms or shallower waters where otters would be expected to be affected. Such a buffer would also include the area where incidental

entanglement in fishing nets might occur. The translocation zone thus defined extends some 10 to 19 nautical miles seaward from the 15 fathom isobath around San Nicolas Island, depending on the offshore wind and current patterns in the area. The Service believes this is a reasonable approach that fully complies with the requirements and intent of Pub. L. 99–625. The major variable is the location of significant at-sea oil spill containment and clean-up equipment. Currently, such equipment is based in Santa Barbara, with additional capability stationed offshore near Point Conception. Public Law 99–625 provides authority to modify the translocation or management zone boundaries, as well as other aspects of the plan, to accommodate new information such as significant improvements in oil spill response capability. Such modifications would, however, need to follow rulemaking and public review procedures.

Comment 6: Public Law 99–625 was enacted by Congress to authorize translocation, management and containment of an experimental population of California sea otters. The Rule must be revised to comply with this as the sole authority for conducting the proposed translocation.

Service Response: The Rule has been modified throughout to comply with requirements of Pub. L. 99–625 (formerly H.R. 1027 and H.R. 4531). The Proposed Rule anticipated enactment of Pub. L. 99–625 and was developed to comply with such legislation in the event it did become law.

Comment 7: The Service has not demonstrated ability to contain the experimental population using non-lethal methods, and the containment strategy does not provide a rapid enough response to effectively maintain the management zone free of otters.

Service Response: The Service has selected San Nicolas Island in part because it is believed to offer the greatest potential for self-containment due to the wide, deep, food-barren ocean channels surrounding it. As described in the Translocation Plan (Appendix B of the EIS), sea otter capture techniques are well developed. Further research and development is underway by the California Department of Fish and Game (CDFG) to refine and improve the existing techniques by utilizing an underwater re-breather device which CDFG believes could be a major breakthrough in decreasing the time it takes to capture specific otters. Research currently getting started in Alaska, funded by the Service, is designed to evaluate and develop techniques to influence fecundity of sea otters, and may prove useful in the future to decrease population pressures in certain situations (such as an island-based population) that otherwise may result in an increase in dispersal tendencies. The Minerals Management Service is currently contracting for studies on techniques to influence sea otter movements. All of these studies will, collectively, add to and enhance our ability to capture and remove otters from the management zone or otherwise assist the Service in containment of the translocated otters. However, even without these, the existing methods have demonstrated repeatedly that with sufficient effort otters can be captured under a variety of conditions. The very process of capturing specific numbers, ages and sexes of otters from specific locations in the present range for translocation purposes should further verify our ability to capture and move a relatively large number (up to 70 over 1–2 months) of specified individuals. Provided weather and sea conditions permit, the number of otters that can be captured in any period of time is directly dependent on the number of crews available to conduct capture operations. To accomplish containment in the future, the number of crews may have to be increased, either permanently or temporarily in order to remove otters from the management zone as required by Pub. L. 99–625. In view of the state of the art in capture techniques, the commitment of the Service to have a crew available at all times to respond to reports of otters in the management zone, and the research and development of new and improved techniques now underway or expected to be carried out in the future, the Service believes that effective containment can be carried out to the extent required in this Rule and Pub. L. 99–625.

The containment strategy has been modified to provide a more responsive posture for capturing and removing otters from the management zone. Instead of requiring repeated and verified sightings of otters in the management zone for a week or more, as in the Proposed Rule, the Final Rule indicates that capture crews will be mobilized after receiving verified sightings of one or more otters in the management zone, as soon as weather and sea conditions permit. This response procedure is expected to provide greater likelihood that otters will not cause significant damage to fisheries or otherwise affect other legitimate uses of the management zone. It will also result in a greater likelihood that otters dispersing into the management zone, where they are less protected, will be safely captured and placed into the range of the parent population or into the translocation zone before they are harmed as a result of incidental take from otherwise lawful activities, such as entanglement in fishing nets, in the management zone.

Comment 8: As an alternative to translocating otters to San Nicolas Island, the Service should consider translocating them to the northern Washington coast or consider transporting Alaskan otters to California in the event the existing California population is decimated. The Service's genetic and taxonomic arguments in the DEIS for not considering these alternatives are not convincing.

Service Response: The reasons for not considering the alternative of translocating sea otters to Washington are discussed in detail in Section III.C.2., Alternatives That Will Not Be Addressed in the EIS, of the Draft and Final EIS. To summarize the discussion in Section III.C.2., a small population of otters of Alaskan origin has been reestablished along the northern Washington Coast. The issue of whether or not California otters are taxonomically or genetically different has been debated in the literature for years and remains unresolved. In the 1977 listing of the California sea otter as threatened, the Service acknowledged the unresolved taxonomic issues, and noted that resolution of the issue was not pertinent to the decision of whether or not the California otter should be listed because the Endangered Species Act provided for listing of geographically separate populations as well as taxonomically distinct species and subspecies. In preparing the final listing rule, the Service took a conservative view that, ultimately, the taxonomic issue could be resolved in favor of separate subspecies, so the listing utilized the subspecific designation, *Enhydra lutris nereis*. In accordance with the subspecific listing status of the southern sea otter in the list of threatened and endangered species, the Service finds that mixing two subspecies, as would occur if California otters were translocated to Washington, could result in hybrid offspring which would not be protected under the Endangered Species Act. Thus, such mixing would not only fail to promote recovery of the listed California sea otter, but could actually adversely affect the listed subspecies by tainting the gene pool sought to be conserved. Section III.C.2. of the EIS has been modified to address the suggested possibility of removing the Alaskan otters now found in Washington and replacing them with California otters. It

also acknowledges that, if the entire California population was destroyed, consideration would be given to using Alaskan otters to try and establish a new sea otter population in California as a last resort measure, but this could not be considered an affirmative recovery action. The Section also discusses other factors, such as lack of significant natural barriers, that contribute to the Washington site not being acceptable as a viable alternative.

Comment 9: There are no guarantees that funding for containment will continue to be available into the future.

Service Response: No guarantees can be made about budgets in future years; however, the Congressional directive contained in Pub. L. 99–625 that the management zone must be maintained free of otters is clear evidence of what Congress expects of the Service. Congress has indicated that it intends to monitor the effectiveness of the Service's containment effort. The Draft and Final EIS and this Rule address the possibility of loss of future Federal funding. The section entitled Criteria for a Failed Translocation describes actions that would be taken, in consultation with the State and Marine Mammal Commission, if containment becomes impossible due to decreases in funding. The section entitled Funding Mechanisms describes the potential for State and private funding to assist with translocation and containment efforts.

Comment 10: The northern boundary of the management zone should be placed at Point Sal instead of Point Conception to protect fisheries between these two points, to enhance the safety of field crews working to remove otters from the management zone, and to increase the likelihood that otters from the existing population will not spread into the important fisheries of the Southern California Bight south of Point Conception. If this is not possible, establish the area between Point Conception and Point Sal as a buffer zone (now referred to as population thinning zone).

Service Response: The management zone boundary was proposed to be established at Point Conception, which, as required by Pub. L. 99–625, means that any otter, regardless of whether it originates at San Nicolas Island or the mainland parent population, must be removed from any location south of Point Conception except the San Nicolas Island translocation zone. In a letter dated April 5, 1985, to the Chairman of the House Subcommittee on Fisheries and Wildlife Conservation and the Environment, the Director of California Department of Fish and Game indicated that establishment of a no-otter zone at Point Conception would meet the State's desire that sea otters not be allowed to reoccupy historical habitat in the Southern California Bight south of Point Conception, where important shellfisheries developed during the absence of otters.

Despite discussions involving interested parties and Congressional representatives, Pub. L. 99–625 was enacted without provision for such a thinning zone. Therefore, the Service declined to include it as part of the translocation plan. The Service acknowledges, however, that such a thinning zone, using non-lethal capture and removal methods, may be a feasible way of alleviating a problem, should it arise, of population buildup and pressures in the immediate vicinity of the management zone boundary. Use of any such thinning technique should, however, be approached cautiously through a scientific research protocol. While this approach is mentioned in the translocation plan and this Final Rule as one possible way of alleviating serious problems of maintaining the management zone free of otters, authority for such an action would have to be secured prior to its use, either through legislative amendments, scientific research permits or through the Marine Mammal Protection Act process for waiving the moratorium on taking (if delisting occurs and an optimum sustainable population (OSP) is achieved).

With regard to the recommendation that the management zone boundary be placed at Point Sal instead of Point Conception, the Service believes this, too, would not be consistent with the provisions or intent of Pub. L. 99–625. Section 1(b)(4) of Pub. L. 99–625 requires specification of a management zone that, (A) surrounds the translocation zone, and (B) does not include the existing range of the parent population or adjacent range where expansion is necessary for the recovery of the species. The Congressional intent of this provision is described in House Report 99–124 and Congressional Records for H.R. 1027 and H.R. 4531.

Specifically, the House Report states, "The reference to 'adjacent range where expansion is necessary for the recovery of the species' * * * is intended to make it clear that in establishing the management zone the Secretary shall not establish a boundary of the management zone that is coterminous with the existing range of the population, which presently extends to the Pismo Beach-Santa Maria River area on the south. Thus, for example, in the event that San Nicolas Island is chosen as the translocation site, the management zone should not include all of the area up to the southern end of the existing range. On the other hand, in the event the Secretary establishes a boundary line for the management zone at Point Conception, such a line would allow for expansion of the range of the sea otter beyond its present range and would fully comply with the requirements of this provision. This provision does not require the Service to make a formal determination of the ultimate extent of the range that is necessary for the overall recovery of the species." H.R. Rep. No. 99–124, 99th Cong., 1st Sess. at 16 (1985).

The Congressional Record of July 29, 1985, further discusses the intent of the management zone. It states, "The management zone is that area surrounding the translocation zone from which the translocated animals are to be excluded. The management zone is intended to minimize potential conflicts, within that zone, between fisheries and other resource uses and the translocated sea otters." 131 Cong. Rec. H6467 (July 29, 1985). Point Sal is only 5 miles from the present range of California sea otters. This stretch of 5 miles is characterized by sandy bottoms and generally poor quality sea otter habitat. Thus, for all intents and purposes, these 5 miles would not provide any additional habitat "needed for recovery of the species" as required by Pub. L. 99–625. Therefore, placing the management zone boundary at Point Sal would not meet the requirements of Pub. L. 99–625.

Comment 11: If the Service perceives that activities such as oil spills occurring outside of the translocation zone as defined in the Proposed Rule could adversely impact the experimental population, then the translocation zone boundary should be enlarged to prevent any activity in the management zone from affecting otters in the translocation zone.

Service Response: The translocation zone has been delineated based on the requirements of Pub. L. 99–625, i.e., that it must have appropriate characteristics for furthering the conservation of the species, and on reasonable assumptions as to the time it would probably take to respond to and control an oil spill occurring outside the zone boundary. It also takes into account the potential for incidental entanglement of otters in fishing set-nets. It should be recognized that, in accordance with Pub. L. 99–625, the protection afforded to otters in the translocation zone is through prohibitions on incidental take, directed takings, and Endangered Species Act section 7 consultations for Federal

activities. The Service has reassessed the boundaries as delineated in the Proposed Rule and finds them to be appropriate for this intended purpose. The Service interprets Pub. L. 99–625 to provide the authority to promulgate changes in the regulation whereby the boundaries of the translocation or management zone could be modified to reflect new information or significantly could be modified to reflect new information or significantly changed conditions.

Comment 12: The preferred site (San Nicolas Island) is the nearest of all sites to current Outer Continental Shelf (OCS) activities and is in an area of moderate potential for discovery of hydrocarbons. Clarification is needed why this site was selected in view of its proximity to OCS development.

Service Response: It is correct that the San Nicolas Island site is the closest of all sites considered to ongoing OCS activity, which is extensive in much of southern California. No OCS development activity has been initiated in the two alternative sites, northern California and southern Oregon, although they are listed in the Secretary's proposed 5-year plan for future OCS lease sales. There are, however, no leased tracts in the San Nicolas Island translocation zone and the closest are at least 35 miles away from the Island. The major ongoing OCS activity occurs in the Santa Barbara Channel area, which is 60 miles or more to the north of San Nicolas. Ongoing activity is not expected to affect or be affected by the presence of the experimental population. An oil spill-sea otter risk analysis was conducted to determine the relative risk of oil spills affecting San Nicolas Island, the present range, and the alternative translocation sites considered. The results indicated that San Nicolas Island is a relatively safe site compared to the present range, with the probability of sea otter mortality due to an oil spill contacting the present range being about 2.4 times greater than for oil spills to cause mortality of otters at San Nicolas. Tankship accidents, rather than OCS activity, were determined to be the likely cause of such mortality at San Nicolas. The results of the risk analysis are included in the Final EIS, Section VI.B.2., and Technical Support Document 3. The risk of spills causing sea otter mortality in the northern California zone was about twice as great as for San Nicolas Island, and the risk in the southern Oregon zone was less than half the risk at San Nicolas. With regard to effects on future OCS development, the area around San Nicolas has been deleted from previous sales due to potential conflicts with Navy activities which are conducted by Pacific Missile Test Center personnel based on San Nicolas Island. Since Navy activities around the Island are not expected to decrease, and their importance is expected to increase in the future, it may be reasonable to assume that future sales in southern California will also consider deletion of the waters around San Nicolas. The State has indicated it has no plans to develop oil within State waters around San Nicolas and the Governor has recommended to the Secretary that waters to at least 6 miles seaward of the Island be deleted from the 5-year leasing plan. According to information provided to the Service by Minerals Management Service, the OCS lands within the translocation zone may contain a mean net economic value of oil and gas resources amounting to $142–284 million, and Minerals Management Service estimates a 1 percent chance of finding economically recoverable oil and gas resources within the translocation zone. The risked mean resource value of those resources, then, would be only $1.4–2.8 million, less than any of the alternative sites.

Comment 13: The economic effects of translocation on sport and commercial fisheries are greatly underestimated and an Economic Regulatory Impact Analysis should be completed.

Service Response: Data to evaluate socioeconomic effects of the translocation on fisheries were obtained from the California Department of Fish and Game (CDFG), Statistical Branch, and National Marine Fisheries Service. There seemed to be general consensus, based on public testimony and communications with representatives of the California Department of Fish and Game, that fishermen have over the years under-reported their catches at San Nicolas Island, partly due to the system used by CDFG for reporting catches and partly due to fishermen not wanting to make public the lucrative fishing around San Nicolas. The Service has updated its data to incorporate into the Final EIS the latest two additional years of landings (1984, 1985) and has noted the values now estimated by affected fishermen of their recent landings around San Nicolas. Even with the updated data, the economic impact does not meet the criteria for the Rule to be considered a "major" Rule as defined in Executive Order 12291 and, thus, no Regulatory Impact Analysis is required. The reader is referred to Volume III (Comments and Responses) of the Final EIS for further discussion on economic impacts and changes made to improve and update estimates of fishery values affected by the improve and update estimates of fishery values affected by the translocation.

Comment 14: There is no guarantee that translocation will lead to delisting or zonal management of the existing population. These must be guaranteed.

Service Response: The Service cannot guarantee that the translocation will ensure recovery and delisting because there are other recovery objectives and delisting criteria that must also be met. The status of the parent population would also have to be factored into any consideration of delisting. The section of the Rule, Relationship of the Translocation to the Status of the Southern Sea Otter, describes in some detail how the translocation fits into the overall recovery requirements for the species. Without translocation it is very unlikely that the species would be recovered or delisted or that any form of zonal management would occur anytime in the foreseeable future. The translocation plan will implement a significant form of long-term zonal management in that it establishes an otter (translocation) zone where the experimental population will be substantially protected, and a no-otter (management) zone wherein otters will be prevented, via non-lethal means, from becoming established. The management zone encompasses the entire Southern California Bight south of Point Conception, including U.S. waters around all offshore islands (except San Nicolas, Begg Rock and the translocation zone) and the mainland coast. This would result in the *de facto* prevention of the existing population from expanding its range into southern California (which is otherwise expected to occur within the next 10–20 years) thus implementing a zonal management program involving the existing population.

Comment 15: The translocation plan does not address the total number of otters that will be needed to achieve the species' optimum sustainable population (OSP) level in California. This must be addressed.

Service Response: The Service agrees that the Draft EIS and Rule do not provide an estimate of the southern sea otters' OSP. Producing an OSP estimate is irrelevant to the purposes of the translocation, i.e., (1) to eliminate the possibility that more than a small proportion of the existing population will be decimated by any single natural or man-caused catastrophe, and (2) to gather data for assessing translocation and containment techniques, population

status, and the influence of sea otters on the nearshore marine ecosystem in order to understand better the characteristics of a population within its OSP range. The first purpose is directed toward recovery of the species pursuant to the Endangered Species Act (ESA), and the second is to better understand OSP for the sea otter, pursuant to the requirements of the Marine Mammal Protection Act (MMPA). By definition, a species listed as threatened or endangered under the ESA is automatically classified as "depleted," or below its OSP, under the MMPA. The OSP question will be dealt with in a separate long-term management planning process described in the Introduction of the Draft and Final EIS. This position is supported by statements in the Congressional Records of July 29, 1985 (House) and October 18, 1986 (Senate) when considering legislation to authorize the translocation.

Comment 16: Carrying capacity of San Nicolas Island is too small to achieve the desired recovery and research purposes. It could also result in another genetic bottleneck.

Service Response: The estimated minimum carrying capacity of San Nicolas Island is 280, and a more likely estiamte is 400–500. Although a site that had a higher carrying capacity may help the population reach its optimum sustainable population (OSP) under the MMPA more rapidly, San Nicolas Island is expected to meet the minimum requirements for a reserve colony for recovery purposes pursuant to the ESA, as described in the sections on Relationship of the Translocation to the Overall Status of the Southern Sea Otter, and Definition of an Established Experimental Population. In addition to meeting the minimum requirements for a reserve colony, San Nicolas has the added advantage over other sites of comparatively lower economic impact to fisheries and a better physical situation for minimizing dispersal and enhancing our ability to contain the experimental population. With regard to the possibility of having another genetic bottleneck, this is unlikely because the Service intends to periodically move a small number of otters (up to five per year) from the parent population to San Nicolas Island specifically to maintain the genetic exchange between the parent and translocated sea otter populations.

Comment 17: Potential adverse impacts of Navy activities on the experimental population make San Nicolas Island a poor choice.

Service Response: The potential impacts of Navy activities at San Nicolas have been evaluated in Section VI.B.2.c. of the Final EIS. The impacts of Navy activities on sea otters around the Island are expected to be insignificant. Pinnipeds are common in the same nearshore waters that would be used by sea otters. There is no evidence that members of these species have been adversely affected by any of the Navy's activities. The threatened Guadalupe fur seal is also an historical occupant of the Island and is now beginning to reestablish itself there in small numbers. There is no evidence that Navy activities will adversely affect the use of the Island by that listed species. Furthermore, while Pub. L. 99–625 specifically exempts defense-related actions from the formal section 7 consultation requirements for actions that may affect the experimental population, they are required to informally confer with the Service on any activities that are likely to jeopardize the southern sea otter. A Memorandum of Understanding will be prepared with the Navy to provide greater assurance that the Navy's activities will not adversely affect the experimental sea otter population.

Comment 18: The translocation plan should define habitat of sea otters to include all waters to a depth of 20 fathoms, not 15 fathoms, as indicated by gill net fishing closures in the present range out to 20 fathoms.

Service Response: It is important to distinguish between sea otter habitat (i.e., the area normally used by sea otters for foraging, rafting, resting, etc.) and the limit required for a gill net closure. In some parts of the pesent range sea otters forage or raft in waters deeper than 15 fathoms; however, this appears to be atypical—most foraging and resting occurs in shallower waters. At the translocation site, there is an abundance of food resources and kelp in waters less than 15 fathoms so otters would not normally be expected to be found in waters deeper than 15 fathoms. Thus, in calculating the translocation zone, the 15-fathom contour is used to define the habitat of the otters. In the unique situation along the current range where a number of otters have been observed drowned in fishing nets set outside the 15-fathom State fishing closure, all have been observed caught in nets set at 15 or 16 fathoms. Of the 220 miles of coastline now occupied, less than 10 percent has been closed to this type of fishing as far out as 20 fathoms. The unique bathymetry that has necessitated these closures in the present range does not appear to occur around San Nicolas. Public Law 99–625 also requires a buffer area to be included in the translocation zone, in addition to the normal habitat of the otter. In the Service's view, the area between 15 and 20 fathoms would be considered a buffer for purposes of fishing restrictions to prevent incidental entanglement of otters. Thus, statements are included in the Final EIS and this Rule that the Service expects the State to close the area out to 20 fathoms around San Nicolas to large mesh gill and trammel set-net fishing. Even if no such closure is invoked by the State, the incidental taking of sea otters in fishing nets would still be a violation of the Endangered Species Act and Marine Mammal Protection Act anywhere in the translocation zone which extends 10–19 nautical miles seaward of the 15-fathom isobath, far beyond the 20-fathom depth curve.

Comment 19: All oil development should be prohibited anywhere within the translocation zone, as implied by definition in Public Law 99–625 that this zone should have appropriate characteristics for furthering conservation of the species.

Service Response: Public Law 99–625 establishes the requirements as to the protections afforded the experimental population within the translocation zone. It requires that the formal Endangered Species Act section 7 consultation process be used to consider federally permitted activities within the zone such as oil resource development. Congress imposed this process rather than a total prohibition on any particular activity. Proposals for oil development within the translocation zone would necessarily be viewed as the Service currently views such activities in the section 7 process, that is, to determine if the action is likely to jeopardize the continued existence of the southern sea otter population as a whole, and, if a jeopardy situation exists, attempt to identify reasonable and prudent alternatives, and to identify reasonable and prudent measures to minimize the impacts of incidental take if such take is anticipated. Once the sea otter has recovered to the point where the species is delisted, the section 7 process would no longer be required, but the protections of the Marine Mammal Protection Act and the prohibitions of Pub. L. 99–625 on incidental and directed take would still apply with regard to the otters within the translocation zone.

Comment 20: Successful establishment of one new population would not, by itself, significantly dilute the impacts of a major oil spill nor would it be sufficient to allow delisting More than one new colony may be needed and other recovery plan objectives must be met.

Service Response: The Service agrees that one successful translocation in itself is not sufficient for delisting the sea otter. All the tasks identified under Objective 1 of the Recovery Plan Outline must be accomplished prior to the Service proposing to delist the sea otter. Delisting the sea otter will require evaluating all the factors put forth under section 4(a) of the Endangered Species Act. However, as stated in the Rule, section on Relationship of the Translocation to the Overall Status of the Southern Sea Otter, the successful establishment of one additional independent colony could achieve one of the three delisting criteria. The decision as to whether or not more than one translocation is needed will depend on the status of the parent population at the time and the degree to which the other two delisting criteria had been met. The translocation plan and Rule, in the section entitled Relationship of the Translocation to the Overall Status of the Southern Sea Otter, contain an example of a scenario in which a single translocation would be sufficient for recovery if the other delisting criteria had been adequately addressed and the status of the parent population is improving. This section has also been revised to clarify that the status of the parent population would also have a bearing on whether or not one additional colony would be sufficient to meet this delisting criteria, and to describe the factors that would have to be evaluated and satisfactorily addressed prior to delisting. In view of the purposes of establishing the reserve colony, i.e., to replenish a damaged parent population and establish a viable, self-sustaining entity that would be distant enough from the parent population that a single catastrophic oil spill would not impact both populations, the Service feels that the establishment of a colony that met the criteria described for "an established population" would substantially contribute to the overall recovery of the population. The idea of establishing a second colony was not intended simply to dilute the threat of an oil spill, but also to ensure that there would be a viable part of the population that could never be affected by the same serious spill that may impact the existing population. A colony meeting the establishment criteria in this Rule would not only accomplish that objective but would also serve the added function of providing a certain number of replacement animals on a sustained basis to repair the parent population if it ever became necessary to do so.

Comment 21: In view of the numerous threats made about harming the otters if translocation proceeds to San Nicolas Island, the Service should maintain a strong law enforcement presence at the Island for at least 5 years.

Service Response: The Rule has been modified to provide that at least two enforcement officers will be assigned specifically to protect the experimental population for at least 3–5 years, and longer if a hostile environment still exists. Before reducing the enforcement effort, the situation would be analyzed to determine if such reductions would be likely to result in harm to the new population. In addition, the long-term presence of Navy and Service Research personnel should serve to deter illegal harassment of the colony. If serious enforcement problems arise, Service Special Agents from other areas would be brought into the investigation to supplement the on-site enforcement officers.

Comment 22: Discussion of birth control or lethal culling as methods of controlling growth and dispersal of the experimental population, a threatened species, is inappropriate and should be deleted from the translocation plan and Rule.

Service Response: Public Law 99–625 requires the Service to maintain the management zone otter-free using non-lethal techniques. The Service's preferred course is to allow natural factors to drive population growth and maintain equilibrium density with little or no dispersal. However, non-lethal management techniques, in addition to capture and removal, will be considered if necessary to maintain the management zone. The Rule, under Containment Strategy, has been revised to clarify that additional authority would be required if lethal taking were to ever be considered. Although not authorized at present, the Service believes that limited use of lethal controls may at some point need to be considered as a last resort option for maintaining the management zone free of otters. Thus, it is only prudent to mention in this section that such taking may eventually require legislative consideration, although it is not authorized at present. Consideration of any additional authority to allow such taking would require extensive public involvement. Zonal management of sea otters will likely be an important part of the Service's long-term program to manage and protect sea otters throughout the range of the species. The Service has been urged to consider zonal management of sea otters by the Marine Mammal Commission as well as the State. The Service also recognizes that zonal management of sea otters in California, by culling or other lethal means, probably will never be an acceptable procedure to most people. Thus, the only option for limiting population growth, once all areas designated as "otter zones" are full, may be through the reduction of fecundity. The Service recognizes that its principal responsibility at present is to help improve the status of the California population. However, if efforts to recover the population are successful, population limitation may be necessary at some time in the future. Since non-lethal techniques to limit sea otter population growth are not yet available, the Service has proposed a sequence of activities, outlined in the translocation plan and Rule, to develop such techniques. Field tests will be done in Alaska. The Service has no intention of using any such limiting techniques on the California population until it is fully recovered, and then only after thorough consultation with the California Department of Fish and Game, the Marine Mammal Commission, and the interested public.

Comment 23: The proposed action has no long-term management plan for the existing sea otter population. There must be a long-term plan before translocation can be agreed to.

Service Response: The Service acknowledges that the translocation plan and Rule do not address the full range of management issues associated with the existing population, but it does go far in addressing both recovery and zonal management issues in that it establishes the entire Southern California Bight, except for the San Nicolas Island translocation zone, as a "no-otter" zone. The question of OSP for sea otters is highly complex, far more than simply deciding where otters should be and where they should not. It may require years, and additional studies, to develop a final OSP figure for southern sea otters. Because of the complexity and likely extended period needed to address the OSP questions, we do not agree that accomplishing the principal recovery objective of establishing a reserve colony should have to wait until the OSP issue is resolved. The Service has committed to initiating a process to develop a long-term management plan immediately after the decisionmaking process on translocation is completed. This view is supported by the House and Senate Congressional Records on H.R. 1027 and H.R. 4531, which state that long-term management, recovery goals, and future translocation needs should be

addressed in the next update of the recovery plan and that the translocation plan itself is not intended to replace the recovery plan as the primary long-term management document. They also clearly state that the translocation plan is primarily a planning mechanism for the translocation itself.

Comment 24: The translocation plan (Appendix B of the Draft and Final EIS) should be incorporated in its entirety into the Final Rule in order to fully comply with H.R. 4531.

Service Response: The Final Rule has been prepared to meet the specific requirements set forth in Pub. L. 99–625 and its legislative history for development of a plan. The Rule as now written contains all the elements required by Pub. L. 99–625. The translocation plan contained in Appendix B of the Draft and Final EIS is merely an expanded discussion of elements contained in the Rule and its content was developed through the rulemaking and National Environmental Policy Act process. The elements of the Appendix B translocation plan that are legally required by Pub. L. 99–625 have been incorporated into the Final Rule.

Comment 25: The Criteria for a Failed Translocation are not responsive enough. The timeframe for deciding whether or not the translocation has failed is too long. The State should be able to request immediate termination action by the Service. If funding for containment is not adequate at any time, the translocation should be declared a failure.

Service Response: The Service disagrees. There must be flexibility to deal with problems, if they arise. The State is a cooperator and will be fully involved in the monitoring of any problem and fully consulted in any decision to declare the translocation a failure. Furthermore, it would require another rulemaking procedure to propose the initial relocation. The Service and State, in consultation with the Marine Mammal Commission, need adequate time and flexibility to evaluate and seek solutions to problems before terminating the project and removing the experimental population.

Comment 26: In the Service's definition of an "established experimental population", one commentor disagrees with including a recruitment figure along with a total number or, if the recruitment figure is essential, the definition should be broadened to include other options including (1) a total experimental population of 170 or carrying capacity, whichever is the lower number, and (2) a total experimental population of 150 males and females with a positive growth rate over a 3-year period. Under one definition of "recruitment", the 20-recruit criterion may never be reached, or the criterion would not continue to be met as the population approaches carrying capacity. The commentor disagrees also with the Service's assumption that the reserve colony must serve as a source of otters to repair a damaged parent population. Its only purpose should be to exist as a viable, self-sustaining population. Anything beyond that is a bonus and should be considered as a "harvestable surplus" for replenishing the parent population, but should not be a requirement for the reserve colony.

Service Response: The Service believes these alternative criteria are not needed for the following reasons: (1) The definition of recruitment has been clarified in the Final Rule; it does not mean population growth, rather it means the number of pups that survive and become independent juveniles (subadults); (2) recruitment as defined and clarified in the text is vital for the purposes of recovery of the sea otters; (3) the definition of an established population has been broadened and now takes into consideration the situation where recruitment may diminish below 20 otters per year as the population approaches carrying capacity; and (4) should the sex and age ratios shift to be similar to those found in the existing population, even at a colony size less than the expected minimum carrying capacity (i.e., 280 otters), the recruitment criteria should still be met. For example, with a population size of 150 sea otters, approximately 75 would likely be females (50 percent) of which about 56 (75 percent of 75) would be of breeding age, from which about 42 (75 percent) would pup annually. Assuming a 50 percent pup mortality, approximately 21 pups would be recruited from that colony. With a population of 280 otters, there may be nearly twice that number of pups recruited. The Service also disagrees with the recommendation to delete the criterion for an "established population" of 20 recruits. The purpose of the second population is more than simply serving as a viable, self-sustaining entity; it must have the additional utilitarian purpose of restoring the population as a whole should the parent population be decimated. In order to accomplish this, the experimental population must be of sufficient size and reproductive viability to withstand the sustained removal of at least 25 animals per year in order to reestablish a population or repair a seriously damaged parent population should it be necessary to do so. The implication of not having this utilitarian purpose is that, even if the parent population were decimated, the surviving experimental population would be sufficient to perpetuate the species with no need to use it to restore a population elsewhere. If that were the case, which the Service does not accept, a much larger second population would be needed than what San Nicolas Island is expected to support or, alternatively, several other populations would be needed at other sites. The available information on habitat quality and carrying capacity at San Nicolas Island, combined with the numbers and sex composition of the animals to be translocated (primarily females), strongly suggests that the recruitment of at least 20 young into the experimental population for 3 to 5 years should be readily achieved, possibly by the end of the first 5 years. To clear up confusion that may exist on the term "recruitment", the term is meant, for purposes of defining an established population and protection and recovery needs for the sea otter, as the number of young-of the-year that successfully enter the population during the year as weaned, independent subadults (juveniles). Recruitment is not synonymous with net increase or growth of the population for this purpose. This clarification has been added to the translocation plan and Rule, section on Relationship of the Translocation to the Overall Status of the Southern Sea Otter, Definition of an Established Experimental Population. The definition of an established experimental population has also been revised and clarified to take into consideration the situation that, as the population approaches or reaches carrying capacity (equilibrium density), recruitment may be slowed considerably due to density-dependent factors such as lower reproductive rate or high pup mortality.

Comment 27: The amended listing table for the experimental population should be modified to correct information on the existing population concerning the scientific and common name, to delete reference to the subspecies name, and to modify the historical range to include all of Alaska and Canada.

Service Response: This Final Rule does not amend the original listing, except to add a section to establish an experimental population. To modify the original listing would require a separate rulemaking procedure under section 4 of the Endangered Species Act. The suggested change, were it to be made, would indicate that the Alaskan population is also listed as threatened,

which is not supported by available data.

Comment 28: The proposed management zone would preclude sea otters from ever being restored to historical habitat now incorporated into the Channel Islands National Park. Since it is the policy of the National Park Service to restore native species where possible and practical, the Service should at least include Santa Barbara Island in the translocation zone.

Service Response: The Service notes that the plan, if successful, will result in prevention of sea otters from reoccupying historical habitat under National Park Service jurisdiction in coastal southern California, unless San Nicolas Island were to be added to the National Park System in the future. Limiting the new colony to San Nicolas Island would achieve the recovery plan objective of establishing a reserve breeding colony, while mitigating and minimizing the impacts to fisheries and other concerns. The Service is committed to initiating a long-term management plan for the existing mainland population in which recommendations will be made for future distribution and population objectives. The restoration of southern sea otters to other areas in the National Park System (outside of the management zone) that have historical sea otter habitat should be considered in the long-term management plan. Please also refer to Section II.A.4. of the Final EIS which summarizes the criteria used in the three-year mapping and evaluation project conducted by James Dobbin Associates, Inc. None of the Islands of the Channel Islands National Park, with the exception of Santa Barbara Island, were deemed suitable as a translocation zone for recovery purposes. Because of their proximity to tanker transportation routes and of significant conflicts with fisheries, these islands were deemed less suitable. Thus, none of the other islands of the Channel Islands National Park were included in the areas given final consideration in the Environmental Impact Statement. The Service agrees that the inclusion of Santa Barbara Island would lend itself well to a joint Fish and Wildlife Service-National Park Service effort to protect the new colony, as well as enhance the enjoyment and education of Park visitors to Santa Barbara Island. The inclusion of Santa Barbara Island in the translocation zone would, however, result in additional impacts by sea otters at the site and could make containment more difficult to achieve. Because of its close proximity to the mainland and other islands, translocation of sea otters to Santa Barbara Island would increase the potential for dispersal of sea otters to other islands and the mainland where fisheries and other activities could be adversely affected.

Comment 29: The research activities associated with translocation could have a significant adverse impact on pinniped populations and the threatened Guadalupe fur seal at San Nicolas Island.

Service Response: The Service has been in contact with National Marine Fisheries Service (NMFS) regarding the potential impact of the activity on the Guadalupe fur seal, and on November 12, 1985, in a letter from the Regional Director, Southwest Region, National Marine Fisheries Service to the Acting Regional Director, Region 1, U.S. Fish and Wildlife Service, NMFS indicated that translocation of sea otters to San Nicolas Island will not adversely affect the Guadalupe fur seal. The Service has been conducting studies at San Nicolas since 1980. There is no evidence that these activities along the shores of San Nicolas Island have been any more disruptive to marine bird and mammal populations than other research activities, and probably less disruptive than many. All research activities on the Island have been closely coordinated with Pacific Missile Test Center Senior Biologist Mr. Ron Dow, with the intent of minimizing possible detrimental effects of human presence on the Island's wildlife. It should be noted that none of the baseline sites in littoral habitats are in areas where pinnipeds typically haul out. One site at which Service biologists are studying the dynamics of black abalone population is near a California sea lion *(Zalophus)* haul-out area; however, this site is visited only during winter when disturbance to *Zalophus* is probably minimal and these visits are coordinated with Mr. Dow's office. There is no indication that sampling of the subtidal sites, or any of the other diving activities being or planned to be undertaken by the Service at San Nicolas Island, have adversely affected pinnipeds other than to attract sea lions. All possible care will be taken to minimize disturbance to presently occurring populations of marine birds and mammals at San Nicolas Island. All activities on the Island are presently, and will continue to be, coordinated with Mr. Dow's office. In addition, the Service will consult with the Southwest Fisheries Center, NMFS, to assure that the increased activities of Service researchers on the Island pose no threat to existing pinniped populations. Radio tracking and observational studies will generally be done from vantage points offering some elevation above sea level that are away from shore. It is highly unlikely that these activities will disturb pinnipeds any more than those resulting from ongoing research activities, including hands-on tagging of adult and newborn pinnipeds, surveys, behavioral and physiological studies, etc. Sea otter surveys are most effectively done by flying offshore and looking downward and inshore toward the animals. It is anticipated that the survey aircraft will remain at least several hundred meters offshore during the surveys, usually much farther. In order to be certain that these activities do not disturb hauled-out pinnipeds (by stampeding them into the water), test flights will be made to determine the altitude and distance from shore that can be flown without disturbing the animals. Surveys will be done using methods determined to be least disruptive to other species of birds and mammals already living on the Island. These preliminary studies and activities will also be coordinated closely with NMFS and Mr. Ron Dow, or their designated representatives.

Comment 30: The Service should shift much of the preamble discussions of the Rule relative to the Relationship of Translocation to the Status of the Species and to Future Endangered Species Act section 7 Determinations into the Regulation Promulgation which amends § 17.84 of Part 17, Code of Federal Regulations, in order to comply with Pub. L. 99-625.

Service Response: Public Law 99-625 requires the translocation plan to be developed through rulemaking procedures for public review and comment which has been done through the issuance of a Proposed and this Final Rule. Public Law 99-625 does not, in the Service's view, require every detail of the translocation plan or preamble discussions to be codified as part of the final regulation. Congress, in enacting Pub. L. 99-625 several months after the Proposed Rule had been published, did not indicate that the Service had misinterpreted the intent of the law, and did not provide additional direction.

Comment 31: The suggestion was made that a new definition be added to the regulation for a "stabilized population" and that the definition of "carrying capacity" be included in the regulation as well as the preamble.

Service Response: Both definitions have been added to the regulation because they have very important meanings in terms of how the translocation relates to future Endangered Species Act section 7

determinations. These definitions help clarify the growth stages of the experimental population on which section 7 analyses will be based.

Comment 32: The suggestion was made that additional background information, taken from the Recovery Plan, should be added to the regulation to help place the importance of translocation to the overall recovery effort into better perspective.

Service Response: The passages have been added to the regulation as suggested since they are taken directly from the Recovery Plan and do add perspective on the role of translocation. Statements have been added that the successful establishment of this experimental population could fully satisfy the first of three criteria (i.e., establishment of at least one additional colony) described in the Recovery Plan. This is qualified, however, by pointing out that the parent population must also be increasing and expanding its range from its present size and distribution in order to meet the broader criterion that the overall population must be increasing at a sustainable rate in a large enough area of its original habitat that only a small proportion of the population could be decimated by any single natural or man-caused catastrophe. This is consistent with the discussion in the preamble and the example given of a scenario that would represent a "recovered population."

Comment 33: The Service was requested to include definitions and discussion of the growth stages of the experimental population in the regulation as well as the preamble and translocation plan, including transplant stage, initial growth and reestablishment stage and post-establishment and growth stage.

Service Response: The Service declines. These stages are all discussed in the preamble of this Rule. The key milestones of the growth stages—stabilized population, established population, and carrying capacity—are defined in the regulation. The Service sees no utility in including the additional, lengthy descriptions of each growth stage in the regulation since the milestones, which are defined in the regulation, are the critical factors in determining how each growth stage influences section 7 (ESA) analyses and possible delisting actions.

Comment 34: In several places of the Proposed Rule, several commentors suggested that the terms "the primary criterion" be used rather than terms such as "a key criterion" when referring to the relationship of translocation to overall recovery of the species.

Service Response: The importance and relevance of the translocation to recovery is explained throughout the Rule. To utilize the suggested phrase "the primary criterion" diminishes the importance of the other recovery criteria as well as the status of the parent population. The Service believes that meeting the other criteria, as well as having a healthy, expanding and growing parent population, are of equal importance to the translocation. Therefore, the suggested changes have not been made.

Comment 35: One commentor suggested that a procedure be included in the regulation whereby the Service would publish notice in the **Federal Register** of the population estimate, if the Service estimates the size to be either 70 or 150 animals, and to invite public comment concerning whether the population is "stabilized" or "established." It was also suggested that the regulation include a process whereby a person may petition the Service to determine that the translocated population is "established" or "stabilized" and require the Service to make findings and publish notice in the **Federal Register** within 180 days of the estimated size and status of the translocated population.

Service Response: The commentor provides no justification or rationale for why this lengthy, expensive and time consuming process is needed, or why existing procedures would not accomplish their objective. Since the definitions of "stabilized" and "established" are generally relevant only from the standpoint of conducting section 7 analyses or initiating a delisting review, there are already formal procedures in place to describe the status of the experimental population. The Biological Opinion issued for any section 7 consultation would contain appropriate data and conclusions on the status of both the experimental and parent populations. Once the Service determines that the experimental population meets the "established" criteria, it will conduct what is comparable to a 5-year status review as well as a delisting review, the results of which would be made available to the public. Additionally, section 4 (b) and (c) of the ESA already provide for petitioning the Service for a reclassification of a listed species and for publication of the results of 5-year reviews, respectively. Thus, the Service declines to incorporate the additional formal public notice and review procedures suggested.

Comment 36: The suggestion was made that the Criteria for a Failed Translocation be included in the regulation as well as in the preamble of the Rule.

Service Response: The Criteria for a Failed Translocation are critical to whether or not the experimental population will achieve its intended purposes or have to be terminated, which would involve Service evaluation and informal rulemaking procedures. Because they hold such importance to the future continuation of the experimental population as well as to future conflicts with fisheries and other uses in the translocation and management zones, the Service agrees with the suggestion and has incorporated the Criteria for a Failed Translocation into the final regulation.

Comment 37: The suggestion was made that a particular quote from a recent Jeopardy Biological Opinion rendered by the Service on full development of oil and gas resources in the northern Santa Maria Basin be included in the regulation. The quote, taken from the Conservation Recommendation section of the Opinion, describes the linkage between a successful translocation to future section 7 determinations and the overall recovery of the species. It indicates that future conflicts between OCS oil and gas development and sea otters can be significantly diminished or avoided if the recovery effort is accelerated and a second colony can be established over the next 5–10 years.

Service Response: The quote in the Opinion was actually in reference to the discussion in the Proposed Rule and translocation plan for this translocation which already contains substantial discussion of the relationship of translocation to future section 7 determinations and recovery of the species. The Service does not believe the quote adds to what is already discussed in the translocation plan and Rule, so the suggested addition has not been adopted.

Comment 38: One commentor suggested that, in addition to considering the existence of a translocated population both qualitatively and quantitatively for section 7 purposes during the initial growth and reestablishment stage, the translocated otters should be viewed as having greater value to the population as a whole than an equal number of otters in the parent population. The rationale given for this suggestion is that otters at the new site are exposed to a lower risk than the parent population and because, even during this stage, the translocated otters could possibly be used to re-populate a damaged parent population.

Service Response: The Service disagrees with the rationale for the suggestion. To say that the translocated otters have a greater worth than otters in the parent population during the initial growth and reestablishment stage because they are subject to a lower degree of risk would be a superficial and arbitrary weighting of the worth of an individual. During this stage in particular, the experimental population would not be expected to be able to supply animals in the numbers needed (25 or more per year) to restore a damaged parent population and still remain a viable, self-sustaining breeding colony. Furthermore, even after the experimental population has "stabilized" and is showing positive signs of eventually becoming an established population, its ultimate fate is still uncertain. Its status is precarious and its numbers during this stage may not even be any greater than the original number translocated. The experimental population at this stage may or may not be able to survive on its own as a self-sustaining entity, and a translocation back to the mainland, should the parent population be decimated, would add to the stress of the original relocation to a new environment. Thus, a case might even be made that, during this stage, the value of a member of the experimental population could be less than that of an otter in the parent population. Thus, the Service sees no justifiable reason to view otters in the experimental population during this stage as having greater value than the same number in the parent population. Thus, the change has not been made in the Rule.

Comment 39: One commentor suggested that language be added to the regulation that "once the population is established, the Service shall assume that the primary goal of the Recovery Plan has been accomplished and, therefore, that the risk to the sea otter from a major oil spill has been reduced to an acceptable level."

Service Response: The Service disagrees with the suggestion because, as discussed under previous comments, such a statement would diminish, even ignore, the importance of the other criteria and objectives in the Recovery Plan as well as the status of the parent population. As already described in the Rule, establishment would trigger a delisting review, but the status of the other recovery criteria and parent population would be important factors in determining if the risk of oil spills to the sea otter had been reduced to an acceptable level. No change has been made in the regulation or preamble to reflect this suggestion.

Description of Action

The Service will establish through translocation a colony of southern sea otters at San Nicolas Island, Ventura County, California. As required by Pub. L. 99–625, two zones, a "translocation zone" and an otter-free "management zone," will be established. The colony will be protected, studied and contained within the specified translocation zone (see IDENTIFICATION OF ZONES segment of the Preamble, infra). Surrounding the translocation zone is the management zone wherein sea otters will be removed if they are found there to minimize potential conflicts with other uses of the resources, to protect those otters because the management zone has less stringent protection measures for sea otters, and to evaluate existing, and, as necessary, develop additional techniques for containing sea otters.

This rule, once implemented, will simultaneously aim for the achievement of these primary objectives: (1) Meeting one essential criterion for recovery and potential delisting of the southern sea otter population under the Endangered Species Act (ESA), and (2) obtaining information and furthering research objectives necessary for present and future management decisions and better understanding and defining the optimum sustainable population (OSP) for this population under the Marine Mammal Protection Act (MMPA). The proposed rule was written in a format that addressed three possible legislative authorities that the Service believed could exist at the time a final rule was published. Since the publication of the proposed rule, Congress passed H.R. 4531 on October 18, 1986, and the President signed into effect Pub. L. 99–625 on November 7, 1986, which parallels one of the legislative scenarios described in the proposed rule. Appropriate modifications have been made in this Final Rule to reflect this legislative authority which is described under the LEGISLATIVE AUTHORITY section of the Preamble.

Pre-Translocation Phase

Activities during this phase emphasize: (1) Assessment of the existing population and the acquisition and analysis of behavioral data, (2) development of a plan for capturing and holding sea otters for translocation, including determination of the optimum size, age, and sex composition of the translocated colony, (3) collection of baseline data on the ecosystem at the translocation site, and (4) completing the public notice and review requirements of the National Environmental Policy Act and Administrative Procedures Act.

1. Assessment of the Existing Population

Insofar as possible, it is necessary to evaluate the possible impacts of removing animals from the existing population for the purpose of translocation, and to develop a monitoring program to test hypotheses concerning expected impacts and to detect and measure unforeseen impacts. Present monitoring programs are done mainly by the Service and California Department of Fish and Game (CDFG). Population surveys are, at present, conducted twice annually by using the following techniques.

Most of the coastline within the range of the population, being accessible by road, is surveyed from shore by teams of two observers each. The remaining areas are surveyed from aircraft. Behavioral studies are being done by observing tagged (flipper-tagged and radio-implanted) and untagged individual sea otters in some portions of the range. The principal emphasis of these studies is to obtain better information on population trend, distribution, movement, diet, and activity patterns.

An increased effort will be devoted to obtaining behavior and movement information from individuals marked with flipper tags and implanted radio transmitters prior to the translocation. During the year prior to the translocation, up to 30 individuals from the parent population will be instrumented with radios that have a predicted battery life of about 2 years. About half of the radioed animals will be among the translocated individuals. The use of radio telemetry according to this design will allow documentation of 24-hour time budgets, foraging behavior, social interactions, and movement patterns before and after the animals are translocated. These data will be used to compare behaviors and movements of individuals before and after the translocation, at both the mainland capture site and the translocation site, as well as to understand better the effects of translocation on the parent population.

2. Removal of Animals From the Existing Population

Limited information is presently available from which to make a judgment on the optimum number, and the age and sex composition of animals to be translocated. Jameson et al.'s (1982) review of previous translocations of sea otters in the eastern North Pacific Ocean indicates a correlation between

success rate and size of the translocated population. However, there are limits to the practicality of this correlation. Logistics, effects of removal on the donor population, and the potential for rapidly achieving and exceeding the minimum estimated carrying capacity (280) for the San Nicolas Island translocation zone, which could conceivably result in a population crash and ultimately a lower equilibrium density for some time period, are factors that must be considered. Based on these findings, and considering that the future welfare of the existing population probably would be best served by minimizing the number of animals taken from it while maximizing the likelihood of success, up to 70 animals will be moved from the existing population to the translocation site in the first year. The limit of 70 animals is set so that the removal will not exceed the expected population growth rate of 5 percent, assuming the current population numbers about 1,400. The estimated long-term growth rate for the population prior to the recently experienced entanglement mortality was about 5 percent per year (CDFG 1976).

No more than 250 animals will be moved in total from the existing population for translocation purposes. Strategies for years 2, 3, 4, 5 and beyond will be governed by the success of preceding effort. Translocation of additional animals will be terminated once a relatively stable group of 70 animals at San Nicolas Island, including both males and females, has been achieved. If, as expected, most of the translocated animals remain within the translocation zone, there will be no supplemental translocation in subsequent years except for genetic enhancement (if necessary) from the parent population involving up to 5 otters per year. However, if a substantial decline is seen in the population or serious imbalance in the sex ratio, additional animals may be moved to ensure success of the translocation.

Most, but not all, of the translocated animals will be sexually immature (i.e., independent, up to about 2 years of age). By selecting young animals for the translocated population, it is expected that post-release dispersal will be minimized and that the future growth rate of the population will be maximized (Kenyon 1969). A further advantage of mainly using juveniles is that they are less likely to interact aggressively while in captivity or following release. The sex ratio of the immature animals selected for translocation will be approximately 4 females to 1 male, although a range of from 3.5:1 to 6:1 will be considered acceptable.

Of the animals translocated each year, up to 20 will be adults. The purpose of moving adults will be to compare movement patterns, particularly dispersal tendencies away from the translocation site, between adult and juvenile sea otters as well as to provide a small number of sexually mature animals that could begin reproducing almost immediately. In selecting animals for translocation, an adult sex ratio of 3 females to 1 male, or 15 females to 5 males will be sought.

3. Studies at the Translocation Site

Since 1980 the Service has been conducting a monitoring program of the intertidal and shallow subtidal ecosystems at San Nicolas Island. The purposes of this program are: (1) To determine the dynamics of nearshore communities relatively free of human influence, in order to contribute to the eventual determination or refinement of an OSP level for sea otters in California pursuant to the MMPA; and (2) to establish baseline ecological information in order to document the range of influences that sea otters, should they be restored there, would have on various components of nearshore communities by comparing changes which occur following translocation with a pre-translocation data base. Densities of abalone, sea urchins, other invertebrates, fish, and kelps, and percent cover of the benthic algal association, are surveyed twice annually at each sample site. Lobster populations are also being surveyed twice annually in late spring and late summer. Kelp canopies are photographed twice annually using aerial infrared techniques, once during the summer maximum extent of the canopy and once during its late winter minimum extent. Data from this program should adequately document spatial and temporal patterns of the sea otter's influence on the coastal ecosystem.

Translocation Phase

Activities during this phase will consist of capture, transport, and release of sea otters. These activities could last 5 years or more, depending on their success, although it is expected that most of this phase will be completed in the first year.

All capture, transport, and release activities will be done if possible between mid-August and mid-October. Earlier in the summer, strong northwesterly winds blow along the coast of California. These winds create heavy seas that would be a detriment to capture operations, although the release site itself is well protected from prevailing weather. After mid-October, the probability of winter storms from the North Pacific Ocean greatly increases. Although capture operations could be halted during such periods with no serious consequences, an inopportune storm could have catastrophic effects at the holding and release sites by increasing work hazards, as well as posing and release sites by increasing work hazards, as well as posing dangers to the otters.

1. Capture, Holding and Tagging

Capture locations will be selected preferably from about the southern one-third of the current range, primarily on the basis of logistical convenience, availability of desired age and sex groups, and welfare of the animals. Techniques proven to be effective and safe in previous translocations and other research on sea otters will be used. Simultaneous capture operations will be centered at Point Piedras Blancas and Morro Bay because both locations offer adequate harboring facilities for small boats.

Point Piedras Blancas is the only location well within the existing sea otter range that is logistically suitable for capturing sea otters. All sex and age classes are present and available for capture near Point Piedras Blancas. At least two sites in the vicinity of Piedras Blancas contain small concentrations of immature male and female sea otters. The primary capture area will extend from Cambria in the south to Salmon Creek in the north. After capture, sea otters will be shuttled to temporary holding facilities. In most cases, individuals will be in transit for no longer than 4 hours.

In the event that the desired number and composition of animals cannot be obtained from the areas described above, it is possible that additional individuals will be taken from the north end of the population's range near Monterey and Santa Cruz. These individuals will be captured from the area between Yankee Point and Point Santa Cruz.

Animals will be captured by: (1) Diver held devices (as developed by CDFG), (2) dip nets used from a small boat (as currently used by Service research personnel at Point Piedras Blancas for catching newly independent otters) or, (3) surface entangling nets (as used by the Service in California and Alaska, and by the Alaska Department of Fish and Game in Alaska). The dip net technique will probably be used extensively since it has been used very successfully in previous research

projects for capturing immature sea otters. Most of the translocated animals will be sexually immature, and most of the pups born in any year are weaned and become independent from their mothers by fall, which is judged to be the most suitable time of year for the translocation.

Each captured animal will be placed in a holding box (approximately 20" wide, 36" long, 24" deep) similar to those developed by the Departments of Fish and Game in Alaska and California. These boxes have proven to be safe and effective for transporting sea otters short distances. Each individual will be taken to the docking facility and carried, or transported by truck, to the holding facilities and then, for translocation to San Nicolas Island, the sea otters will be trucked to the respective local airports.

Under optimum conditions, all animals to be translocated in a given year will be held at the capture sites or holding facilities prior to their movement to San Nicolas Island. All animals are expected to be captured within three weeks. If logistic or weather-related difficulties are encountered, it may be necessary to spread the translocation effort over a period of up to 60 days. Under these circumstances, smaller groups of otters will be maintained at holding facilities, with two or more separate transport and release operations. At least 24 otters will be moved to San Nicolas Island during the first transport. All animals will be examined at the holding facility by a veterinarian (with experience treating marine mammals) before they are moved to the Island. The animals will be fed fish fillets and squid (*ad libitum*), supplemented by other shellfish species as available. Males and females will be held in separate tanks, and isolated from public view or disturbance to the greatest extent practicable. Twenty-four hour security and observation will be provided at all times when otters are in captivity. Handling of otters in captivity will be kept to a minimum.

All individuals will be tagged with color-coded temple tags on the interdigital webbing of the rear flippers, in varying combinations of color and position which allow identification of individuals from a distance. A permanent mark or tag, such as a small ear tag (as used by CDFG, Ames et al. 1983) and miniature transponders (implanted subdermally) will also be used to help assure "in hand" recognition of individuals in case flipper tags are lost. As previously described under "Assessment of the Existing Population," up to 30 individuals will be captured up to one year before each transplant period and implanted with radio transmitters. Approximately half of these animals will be recaptured and translocated.

Animals will be weighed and their sex determined at the time of capture. Blood samples from some of the animals will be taken for genetic and veterinary studies. Teeth will be examined for general condition at the time of capture. Each animal will be injected with tetracycline, if safe and effective doses can first be determined by the Service or veterinary community, in order to provide a potential marker for future age and growth studies. Only animals judged to be in good health by the veterinarian will be moved to the translocation site. Sick animals will be released or treated by the veterinarian and then released in the capture area upon recovery.

2. Transport

The animals will be transported from the holding facilities to San Nicolas Island by aircraft. If necessary, the cargo area will be air conditioned to 65 °F or less to prevent the animals from overheating. Animals will be accompanied and kept under surveillance while in flight. During transport, the animals will be held in individual cages. The animals will not be fed during transport. They will be sprinkled with cold water or ice if there are indications of overheating.

Under optimum conditions of weather with high capture rate, animals will be flown in several groups to San Nicolas Island. The flight will take place once all animals are in hand and judged to be in good condition. The animal will be offloaded from the aircraft at San Nicolas onto trucks, and driven immediately to the release site.

3. Release

Animals will be held in floating pens which will be securely anchored in the sand bottom at Daytona Beach, San Nicolas Island. This site is protected from onshore winds and heavy seas, which normally are from the northwest during summer and fall. It is the most suitable anchorage at San Nicolas Island and there is road access to the area.

A series of 8 to 10 floating holding pens will be used and there will be no more than 15 individuals in any pen. Males and females will be held separately. Unusually aggressive animals will be isolated from the others. The holding pens will be approximately 12' long by 12' wide by 6" deep, and constructed of a frame of aluminum tubing covered by 2" stretch nylon net. The pens will be buoyed with styrofoam blocks attached to the outside such that about two-thirds of the pens' depth is submerged. A haul-out platform for the otters will be provided on the interior of each pen. This pen design has been used successfully in previous sea otter research.

A charter vessel, with large freezer capacity to store food, will anchor and standby at Daytona Beach during the entire period that animals are being held in the floating pens. This vessel will provide a platform for 24-hour surveillance of the animals while they are in captivity at San Nicolas Island. In addition, it will serve as a food storage facility. While in captivity at San Nicolas Island, the animals' diet will be supplemented with locally common food resources. If necessary, additional food could be air freighted from Point Mugu Naval Air Station to San Nicolas Island, and put aboard the vessel.

The animals will be held from two to five days in floating pens at the release site. It is thought that this interval will allow the animals to recover from the stress of transit and to become more accustomed to the area. The animals will be released passively by opening the floating pens and allowing them to leave at will. To encourage feeding in their new environment, the otters will not be fed during the last 6 hours in captivity. The release will take place shortly after dawn in order to allow maximum time during daylight for the animals to visually orient to their new environment, and to allow shore-based of southern California that are not now occupied by sea otters. If dispersal from San Nicolas Island were to result in return to the existing population, no further effort will be made to capture the dispersing animals and return them to the translocation site except as described under Containment Efforts. If dispersal were from San Nicolas Island to some other location, the animals will be captured, and depending on the circumstances, returned and released to either the donor population or the translocation site, with return to the donor population being preferred.

Ecosystem level studies at San Nicolas Island primarily will involve monitoring littoral and sublittoral baseline stations (this includes populations of abalone, sea urchins, and fishes), kelp canopy distribution and abundance, and lobster populations. These studies will continue at the present level of effort with adjustments as needed to improve design or sampling sufficiency. This information, in conjunction with the pre-translocation data base and the population level

studies, will provide documentation of changes in the structure of the nearshore ecosystem as the sea otter population increases from low to high densities. Additional studies will be done on: (1) The population biology of red and black abalones, (2) lobster populations, (3) plant-herbivore interactions, (4) reef fish populations, and (5) socioeconomic issues, such as the effects on kelp harvesting, shellfish and finfish harvest, and recreational activities. These studies will be necessary to understand the nature and causes of change brought about by the sea otters, and the potential effects of such changes on recreational and socioeconomic activities as well as effects on the experimental population itself and its optimum sustainable population level.

2. Containment Efforts

Because it is an island with abundant prey in surrounding waters and is separated from other shallow water areas where food is available by long distances of deep open ocean, dispersal away from San Nicolas Island is expected to be negligible, at least prior to attainment of carrying capacity. As the animals approach carrying capacity, an increase in dispersal to nearby islands and perhaps the southern California coast might occur. It would be possible to limit the population at or below carrying capacity and thus prevent large-scale dispersal away from the island, by one of the following techniques: (1) Selective removal of animals from the translocation zone using non-lethal methods and relocation to the parent population; or (2) imposing birth control measures on some of the individuals within the translocation zone.

The Service and CDFG will jointly manage an effort to locate otters that may disperse from the translocation zone into the management zone. This effort will rely heavily on public participation/reporting. A "hot line" number will be established and publicized so that individuals who observe otters in the management zone could report the number and location of sea otters observed. The Service will seek appropriate agreements with other Federal and State agencies that have jurisdiction within the management zone (e.g., CDFG, Navy, National Marine Fisheries Service and National Park Service) to assist in reporting, verifying and capture of otters and protection of other resources in the areas where capture and removal operations will be conducted. Aerial reconnaissance by CDFG and/or the Service will be initiated if studies at the translocation site indicate that a significant proportion (e.g., 10–20 percent) of the animals may have dispersed from the translocation zone. Radio-implanted otters that leave the translocation zone will be tracked to the extent possible. If verified sightings of one or more sea otters are made at any location within the management zone, field crews will be mobilized as soon as weather and sea conditions permit to capture and remove the otter(s) from the zone.

Capture will be done by experienced State and/or Federal personnel using one or more of the same techniques used in the translocation effort, such as: (1) Diver-held devices; (2) surface entangling nets; or (3) dip nets. Additional techniques, such as injection of immobilizing drugs with darts, will be developed in the future, if deemed necessary. Captured otters will be returned to either the translocation zone or to the existing range. Most will either be returned to the original capture site in the existing range or released in the vicinity of Monterey Bay where their behavior will be compared with those returned to the original capture site. Animals either will be flown or moved by air-conditioned van to the release site. If not already implanted, captured animals will, to the extent possible, be implanted with a radio transmitter in order to obtain detailed information on their behavior following their release.

Capture and relocation will serve as an effective containment technique as long as there is available habitat where sea otters are desired. Public Law 99–625 requires that otters captured in the management zone must be returned either to the translocation zone or the range of the parent population. Eventually, after all such areas are occupied, population stabilization may require an artificial balancing of overall births and deaths (Hofman 1985). Therefore, research will be initiated to identify and evaluate techniques for limiting population growth by reducing fecundity. This work will be done in three stages, including a thorough review of literature on birth control in other wild mammal populations, laboratory experiments to test the most promising techniques if any are identified, and then field experiments in Alaska with Alaskan sea otters. Other techniques such as culling, or non-lethal thinning of the donor population, to minimize dispersal into the management zone would require additional authority.

3. Protection of Translocated Population

At least two enforcement officers will be integrated into the translocation effort. The officers will establish regular contacts with the other parties involved in the translocation process, develop a working knowledge of the sea otter recovery and research program and potential law enforcement problems, and develop a cooperative enforcement arrangement with other agencies with jurisdictional responsibilities, e.g., U.S. Coast Guard, National Marine Fisheries Service, California Department of Fish and Game, U.S. Navy, and National Park Service to assist with protecting the experimental population in the most effective and efficient manner possible. The officers will be equipped with a sea-going vessel and equipment to carry out frequent enforcement patrol and surveillance to minimize the chance of harassment or other illegal activities affecting the translocated sea otters. Both the on-site officers and the translocation research team will be monitoring the new colony, therefore, any illegal activities will likely be observed and enforcement actions taken. At a minimum, the officers will be needed for the duration of the actual translocation and for at least 3–5 years thereafter, after which their continued full-time need will be evaluated.

Legislative Authority

Public Law 99–625 enacted on November 7, 1986 is the primary Federal legislative authority under which this translocation plan will be implemented. In enacting Pub. L. 99–625 Congress has provided the authority and established the requirements for translocating, establishing and managing a second colony of California sea otters. This special legislative authority, similar to section 10(j) of the ESA, provides for the establishment, containment, and management of an experimental population of California sea otters pursuant to a translocation plan which must be developed by regulation and administered by the Service in cooperation with the appropriate agency of the State of California. Pub. L. 99–625. Section 1(b) 100 Stat. 3500 (1986). Pursuant to the requirements of section 1(b) of Pub. L. 99–625, this translocation plan must include the following:

(1) The number, age, and sex of sea otters that will be relocated.

(2) The manner in which the sea otters will be captured, translocated, released, monitored, and protected.

(3) The specification of a zone (herein referred to as the "translocation zone") to which the experimental population will be relocated. This translocation zone must have appropriate characteristics for furthering the conservation of southern sea otters.

(4) The specification of a zone (herein referred to as the "management zone") that— (A) Surrounds the translocation

zone; and (B) does not include the existing range of the parent population or adjacent range where expansion is necessary for the recovery of the species.

The purpose of the management zone is to: (i) Facilitate the management of sea otters and the containment of the experimental population within the translocation zone, and (ii) to prevent, to the maximum extent feasible, conflict with other fishery resources within the management zone by the experimental population. Any sea otter found within the management zone must be treated as a member of the experimental population. The Service will use all feasible non-lethal means and measures to capture any sea otter found within the management zone and return it to either the translocation zone or the range of the parent population.

(5) Measures, including an adequate funding mechanism, to isolate and contain the experimental population.

(6) A description of the relationship of the implementation of the translocation plan to the status of the species under the [Endangered Species] Act and to determinations of the Secretary under section 7 of the Act.

While the experimental population of sea otters generally is to be treated as a threatened species for purposes of the ESA, section 1(f) of Pub. L. 99–625 provides that, for purposes of implementing the translocation plan, no act by authorized Service or State officials that is necessary to effect the relocation or management of any sea otter under the plan may be treated as a violation of either the ESA or the MMPA.

Identification of Zones

Section 1(b) of Pub. L. 99–625 requires the translocation plan to specify two zones for the experimental population, a translocation zone and a management zone. Public Law 99–625, Section 1(b) 100 Stat. 3500 (1986). The translocation zone is the area in which California sea otters are to be relocated, and it must have appropriate characteristics for furthering the conservation of the species, including occupiable habitat and a buffer to insulate the experimental population from adverse effects of activities that may occur outside the translocation zone. The management zone is to surround the translocation zone, but cannot include the existing range of the parent population or adjacent range where expansion of the parent stock is necessary for recovery of the species. The purposes of the management zone are to facilitate management and containment of the experimental population and to minimize to the maximum extent feasible conflict between the experimental population and fishery resources and oil and gas exploration and development activities. Any sea otter found within the management zone is to be returned to either the translocation zone or to the range of the parent population. Public Law 99–625, Section 1(b)(4) 100 Stat. 3500 (1986).

This rule establishes a translocation zone for the experimental population at San Nicolas Island, the nearby islet of Begg Rock, and surrounding waters within the following coordinates:

North Latitude/West Longitude

33°27.8′/119°34.3′
33°20.5′/119°15.5′
33°13.5′/119°11.8′
33°06.5′/119°15.3′
33°02.8′/119°26.8′
33°08.8′/119°46.3′
33°17.2′/119°56.9′
33°30.9′/119°54.2′

The translocation zone boundary is drawn taking into account the availability of food resources, rafting sites and kelp beds as well as wind and wave patterns, offshore currents and other oceanographic variables and the types and magnitude of activities that may adversely affect the experimental population. 131 Cong. Rec. H6467 (July 29, 1985). Waters surrounding San Nicolas Island out to at least the 15-fathom contour within these coordinates provide highly suitable habitat for California sea otters. Hstorically, sea otters were present at San Nicolas Island in considerable numbers. Kelp forests flourish near the island and prey species such as abalone, sea urchins, crabs, clams and mussels are abundant. A buffer area is added to that area identified as sea otter habitat (i.e., coastal waters within the 15-fathom contour). This buffer area is based on wind and sea conditions, projected movement of oil from hypothetical oil spills and response time required to contain or divert those spills using one or more of the existing oil spill response vessels. The area delineated by the coordinates of the translocation zone provides sufficient response time to intercept and divert or possibly contain an oil spill occurring anywhere outside the translocation zone before it could reach sea otter habitat within the 15-fathom contour around the Island, provided weather and sea conditions permit effective deployment of containment equipment. The translocation zone is also large enough to provide a buffer between sea otter habitat and fishing activities in the management zone that may result in incidental entanglement.

The management zone set forth in this rule consists of all waters, islands, islets, and land areas seaward of mean high tide subject to the jurisdiction of the United States, including State tidelands, located south of Point Conception, California (34°26.9′ N. Latitude), except for any area within the translocation zone. The management zone surrounds the translocation zone and begins approximately 50 miles to the south of the southern limit of the existing range of the parent population which is at the Santa Maria River. Thus, as required by Pub. L. 99–625, the management zone surrounds the translocation zone and does not include any of the existing range of the parent population or any adjacent range where natural expansion may be necessary for recovery of the species. As discussed later in this preamble, the Service will use all feasible non-lethal means and measures to capture any sea otter found within the management zone and return it to either the translocation zone or to the range of the parent population. Capture and relocation of sea otters found in the management zone will serve to contain the experimental population, to minimize conflicts between sea otters and fishing and oil and gas exploration and development activities in the management zone, and to protect those otters because the management zone has less stringent protection for otters.

Protective Regulations

Pub. L. 99–625 generally provides that any member of the experimental population of California sea otters shall be treated as a threatened species. Pub. L. 99–625, section 1(c), 100 Stat. 3500 (1986). Section 9(a)(1)(G) of the ESA prohibits any violation of a regulation pertaining to a threatened species promulgated by the Secretary pursuant to authority provided by the ESA. 16 U.S.C. 1538(a)(1)(G). Section 4(d) of the ESA authorizes the Secretary to issue protective regulations for threatened species. 16 U.S.C. 1533(d).

Pub. L. 99–625 provides several exceptions to otherwise enforceable restrictions for California sea otters belonging to the experimental population. Regardless of the zone, no act by an authorized Service or State official that is necessary to effect the relocation or management of a California sea otter under the translocation plan may be treated as a violation of the ESA or the MMPA. Pub. L. 99–625, section 1(f), 100 Stat. 3500 (1986). Within the translocation zone,

Pub. L. 99–625 provides an exception to sections 7(a)(2) and the incidental taking provisions of the ESA for "defense-related agency actions" which the law defines as agency action carried out directly by a military department. However, section 7(a)(4) of the ESA (the informal conference process) will apply to defense-related actions occurring within the translocation zone. Within the management zone, Pub. L. 99–625 provides an exception from taking prohibitions of the ESA and MMPA for incidental taking during the course of an otherwise lawful activity.

Within both the translocation zone and the management zone, this rule will, with some exceptions, impose all of the prohibitions provided for endangered species by 50 CFR 17.21(a)–(f). Section 4(d) of the ESA authorizes the Secretary to impose with respect to a threatened species any or all prohibitions applicable to endangered species. 16 U.S.C. 1533(d). For both zones, this rule provides an exception to the prohibitions for actions by authorized Service or California Department of Fish and Game officials or their designated agents that are necessary to effect relocation or management of a California sea otter under the translocation plan. For both zones, this rule provides an exception to the prohibitions for any action authorized by a threatened species permit pursuant to 50 CFR 17.32 (for example, a permit authorizing research involving an experimental population sea otter to be carried out by a university or college).

With regard to the translocation zone, this rule provides an exception to the prohibitions for incidental taking during the course of a defense-related agency action carried out directly by a military department. The term "military department" does not include the Coast Guard. See H.R. Rep. No. 99–124, 99th Cong., 1st Sess. 18 (1985). As discussed previously, this exception is required by Pub. L. 99–625, section 1(c). Because the Service will be conferring with the Navy through the ESA section 7(a)(4) process on any action that is likely to jeopardize the continued existence of the listed sea otters, and will develop a Memorandum of Understanding with the Navy, the Service does not anticipate that Navy operations on the island or its surrounding waters will adversely affect an experimental population of California sea otters.

Within the management zone, this rule provides an exception to the prohibitions for incidental taking that occurs during the course of an otherwise lawful activity. As discussed previously, this exception is required by Pub. L. 99–625 to avoid conflicts between sea otters and fishing activities, oil and gas exploration and development, and other resource-related activities. See H.R. Rep. No. 99–124, 99th Cong., 1st Sess. 3, 16–17 (1985); 131 Cong. Rec. H6468 (July 29, 1985). For the reasons given above, the Service finds that the protective regulations contained in this rule are necessary and advisable for the conservation of the experimental population of sea otters.

Applicability of Section 7(a)(2) Within the Translocation and Management Zones

Under section 7(a)(2) of the ESA, Federal agencies must ensure that any action authorized, funded, or carried out by them is not likely to jeopardize the continued existence of an endangered species or a threatened species or result in the destruction or adverse modification of designated critical habitat. Any Federal action that "may affect" an endangered or threatened species or critical habitat must be evaluated through formal consultation under section 7. The southern sea otter, a threatened species, is generally protected by this interagency consultation requirement.

Pub. L. 99–625 establishes precise limits on the applicability of section 7(a)(2) to an experimental sea otter population. Under Pub. L. 99–625 the location of the Federal action is controlling: If the proposed Federal action is to be implemented within the translocation zone (except for defense-related agency actions and actions initiated prior to the enactment of Pub. L. 99–625), then the requirements of section 7(a)(2) would apply; if the proposed action is to be implemented within the management zone (although adverse effects could spill over into the translocation zone), then section 7(a)(2) does not apply, unless the proposed action "may affect" the parent population of southern sea otters. Pub. L. 99–625 further provides that the informal conference requirement of section 7(a)(4) of the ESA applies to Federal activities within the management zone and to defense-related activities (*i.e.*, actions directly implemented by a military department) in either zone.

Containment

Pub. L. 99–625 requires, as a component of the translocation plan, that the Service describe measures, including an adequate funding mechanism, to isolate and contain the experimental population. The legislation emphasizes the importance of maintaining an otter-free management zone in order to prevent, to the maximum extent feasible, conflict with fishery and other resources within the management zone by the experimental population. Pub. L. 99–625 delegates broad authority to capture and remove, by non-lethal means, otters from any location within the management zone, including units of the National Park System or marine sanctuaries. *See* 131 Cong. Rec. H6467 (July 29, 1985). The legislative history for Pub. L. 99–625 specifically acknowledges that members of the parent population may occur within the management zone and requires their removal in order to maintain that zone free of otters. 131 Cong. Rec. H6467 (July 29, 1985) states that successful implementation of a "zonal management" concept could greatly improve the recovery of the sea otter by reducing threats to the species and by reducing conflicts with other resources. Containment of the experimental population at San Nicolas Island by maintaining the surrounding management zone as otter-free will result in implementation of zonal management for southern California south of Point Conception since maintenance of the otter-free zone associated with the experimental population will also result in prevention of natural expansion of the parent population into any area of the management zone south of Point Conception in southern California.

The methodology for conducting the containment effort was described previously under "Post-Translocation Phase, 2. Containment Efforts." If verified sightings of one or more sea otters are made at any location within the management zone where they could impact fisheries or be in danger from incompatible activities, field crews will be mobilized to capture and remove the otter(s) from the zone as soon as weather and sea conditions permit.

With regard to containment, it will be desirable to determine when the population is approaching carrying capacity of the habitat within the translocation zone. This should be evident from information that would be obtained in the monitoring program. The following changes are expected as the population approaches carrying capacity: (i) The growth of the population is expected to decline; (ii) juvenile mortality rate is expected to increase to about 70 percent or higher; (iii) the time spent foraging is expected to increase from 20–30 to over 50 percent of the total time budget; and (iv) the diet is expected to diversify to include less nutritious prey and prey that requires more energy to obtain.

As discussed earlier in this document, a minimum of about 10 years is expected for the population to reach carrying capacity. Dispersal away from San Nicolas Island is expected to be negligible, at least prior to attainment of carrying capacity. As the animals approach carrying capacity, dispersal to nearby islands and perhaps the southern California coast may occur. It would be possible to limit the population at or below carrying capacity, and thus prevent large-scale dispersal away from the Island and possibly maintain a higher reproductive rate, by one of the following three techniques: (i) Capturing animals from the population for translocation elsewhere, (ii) imposing birth control measures on some of the individuals; or (iii) selective or random culling of the population which would require changes in statutory authority if lethal means were to be considered. A permanent Sea Otter Management and Coordination Office will be established and maintained at a field location near the "management zone." The Office will coordinate the containment effort, verify and respond to reports of otters in the management zone, maintain public relations and interagency coordination and cooperation, serve as a contact point and source of information for the public and other agencies, continue to coordinate the overall recovery program for the California sea otter, and take the lead in working with the State(s) on a long-term management plan for the southern sea otter. The Office will work closely with State biologists to remove otters from the management zone.

Funding Mechanisms

Successful implementation of this plan depends on an adequate commitment of funding and personnel. The Service will seek funding through its normal Congressional appropriations process. Contributions from other Federal sources and non-Federal sources may also be obtained. Federal funding will be administered through the U.S. Fish and Wildlife Service. Although the Service cannot obligate funds for which it has not received an appropriation, the Service has funding in the FY-87 budget for translocation, research, protection, and containment of the experimental population.

The Service can also enter into interagency agreements for the transfer of Federal funds from another agency to the Service. Such an agreement will be sought when interagency cooperation would facilitate achieving mutual program policies, requirements, or goals. Also, unexpended balances of Federal funds may be available for grants for specific activities and can be granted by the Service to States that have entered into cooperative agreements under section 6 of the ESA. Research, management, protection and containment of the translocated population will be considered an appropriate use of such funds while the species is listed under the ESA. The State of California may also request grants in Wildlife Restoration (Pittman-Robertson) Act, or, under section 110 of the MMPA for these purposes, subject to the availability of funds.

Non-Federal funding could be received through donations, and such donations will be administered through the National Fish and Wildlife Foundation.

Effects on Recovery and Section 7 Determinations

Pub. L. 99–625 requires that the translocation plan contain a description of the relationship of implementation of the plan to the status of the species under the ESA and to determinations of the Secretary under section 7 of the ESA. The following section describes those relationships. Terminology used reflects the language contained in Pub. L. 99–625, as well as in the ESA. Throughout this discussion, the terms new population, experimental population, and colony are used interchangeably when referring to the translocated otters.

Relationship to the Status of the Species

The recovery plan for the southern sea otter contains five goals and numerous objectives that must be accomplished for the species to be considered for removal from the Federal list of endangered and threatened species. The five broad goals are to: (1) Minimize the risk of oil spills; (2) minimize the possible effects of oil spills; (3) minimize vandalism, harassment, and incidental take of sea otters; (4) monitor recovery progress of the existing population and any new colonies; and (5) integrate recovery plans into development and management plans of local coastal governments. This translocation is intended to address primarily the goal of minimizing the possible effects of oil spills. Specifically, the recovery plan states the following in regard to delisting, which is directly relevant to the relationship of a translocation to the overall status of the species:

> Delisting should be considered when the southern sea otter population is stable or increasing at sustainable rates in a large enough area of their original habitat that only a small proportion of the population would be decimated by any single natural or man-caused catastrophe. To reach this point: (1) at least one additional population of sea otters must be established outside the current population range, (2) the existing population of sea otters and its habitat must be protected, and (3) the threat from oil spills or other major environmental changes must be minimized.

The recovery plan specifically describes the importance of translocation to recovery and delisting where it states the following:

> Sea otter translocation, if properly designed and implemented, should provide the necessary foundation for ultimately obtaining the Recovery Plan's objective and restoring the southern sea otter to a non-threatened status and maintaining OSP by: (i) Establishing a second colony (or colonies) sufficiently distant from the present population such that a smaller portion of southern sea otters will be jeopardized in the event of a large-scale oil spill, and (ii) establishing a data base for identifying the optimal sustainable population level for the sea otter. Subsequently the number and location of additional translocations that may be necessary to obtain the optimal level should be determined.

The successful establishment of the experimental population to be carried out pursuant to this rule should fully satisfy the first criterion specified above from the Recovery Plan, provided that the parent population is showing sustained growth and expanding its range from its present size and distribution. However, if such growth and expansion is not occurring, the establishment of a single new population may not be sufficient to satisfy the broader criterion that the population must be increasing at a sustainable rate in a large enough area of its original habitat that only a small proportion of the population would be decimated by any single natural or man-caused catastrophe.

In order to consider whether recovery is attained, the other criteria, as well as the status of the parent population, would need to be evaluated in depth to determine whether or not oil spill and other major environmental or population threats are minimized to the maximum extent practicable. Although progress toward achievement of all five recovery plan goals would have to be evaluated and each goal met before delisting could occur, the establishment of at least one additional colony would be a prerequisite to consideration of delisting in order to meet the recovery plan requirements.

The relationship of translocation to the status of the California sea otter population, from an ESA standpoint, would change sequentially through distinct stages. The critical element in the sequence is the point at which the experimental population would be

determined by the Service to be "established," based on specific scientific criteria. The Service defines "established experimental population" as one which meets the following criteria: (1) An estimated minimum of 150 healthy male and female sea otters residing within the translocation zone, little or no emigration into the management zone occurring, and a minimum annual recruitment of 20 sea otters into the experimental population occurs within the translocation zone for at least 3 years of the latest five-year period; or (2) replacement yield is sufficient to maintain the experimental population at or near carrying capacity during the post-establishment and growth phase or the carrying capacity phase of the experimental population. Recruitment, for this purpose, means young-of-the-year that are weaned, independent from their mothers, and are entered into the population as subadults (juveniles).

The population estimate would be derived by the Service from periodic ground and aerial counts conducted by the Service and/or California Department of Fish and Game, or designated agents thereof, with appropriate adjustment factors to account for visibility or other counting technique biases. Annual recruitment would be derived by the Service using a combination of factors such as known pup production and mortality and annual growth of the experimental population as a whole as evidenced by results from periodic counts and population estimates.

The minimum of 150 otters estimated to be residing within the translocation zone and minimum annual recruitment of 20 are based on the expectation that this combination should be sufficient to be self-sustaining and to supply at least 25 primarily immature otters per year for 1 to 3 years if it became necessary for replenishing the parent population in the event of a catastrophic event such as a large oil spill. A minimum of 25 immatures is believed necessary based on empirical evidence from previous translocation efforts in which sea otters from Alaska have been used to attempt to reestablish populations in other areas of historic habitat (Jameson et al. 1982). The figure of 25 is believed to be a reasonable minimum number that, if translocated, for the most part would remain in an area and form a breeding nucleus from which repopulation through natural reproduction might occur. Carrying capacity, a threshold that would be determined through research, would not necessarily have to be reached in order for the new population to be considered established.

In addition to defining when the experimental population would be considered established, criteria are also needed to describe the circumstances in which the Service would consider the translocation to have failed. The translocation would generally be considered to have failed if one or more of the following conditions exist:

(1) If, after the first year following initiation of translocation or any subsequent year, no translocated otters remain within the translocation zone and the reasons for emigration or mortality cannot be identified and/or remedied;

(2) If, within three years from the initial transplant, fewer than 25 otters remain and the reasons for emigration or mortality cannot be identified and/or remedied;

(3) If, after two years following the completion of the transplant phase, the experimental population is declining at a significant rate and the translocated otters are not showing signs of successful reproduction (i.e., no pupping is observed); however, termination of the project under this and the previous criterion may be delayed if reproduction is occurring and the degree of dispersal into the management zone is small enough that the effort to continue to remove otters from the management or no-otter zone would be acceptable to the Service and the California Department of Fish and Game (CDFG).

(4) If the Service determines, in consultation with CDFG and the Marine Mammal Commission, that otters are dispersing from the translocation zone and are becoming established within the management zone in sufficient numbers to demonstrate that containment cannot be successfully accomplished. This standard is not intended to apply to situations in which individuals or small numbers of otters are sighted within the management zone or temporarily manage to elude capture. Instead, it is meant to be applied when it becomes apparent that, over time (one year or more), otters are relocating from the translocation zone to the management zone in such numbers that: (1) An independent breeding colony is likely to become established within the management zone, or (2) they could cause economic damage to fishery resources within the management zone. It is expected that the Service could make this determination within a year provided Service could make this determination within a year provided sufficient information is available;

(5) If the health and well-being of the experimental population should become threatened to the point that the colony's continued survival is unlikely, despite the protections given to it by the Service, State, and applicable laws and regulations. An example would be if an overriding military action for national security were proposed that would threaten to devastate the colony and removal of the otters was determined to be the only viable way of preventing the loss of the individuals.

If, based on any one of these criteria, the Service concludes, after consultation with CDFG and Marine Mammal Commission, that the translocation has failed to produce a viable, contained experimental population, this rulemaking will be amended to terminate the experimental population, and all otters remaining within the translocation zone will be captured and placed back into the range of the parent population. Efforts to maintain the management zone free of otters would then be curtailed after all reasonable efforts had been made to remove all otters that were still within the management zone at the time of the decision to terminate the experimental population. Reasonable efforts would include efforts up to the point that the Service and CDFG jointly determine that further efforts would be futile.

Prior to declaring the translocation a failure, a full evaluation would be conducted into the probable causes of the failure. If the causes could be determined and legal, reasonable remedial measures identified and implemented, consideration would be given to continuing to maintain the experimental population. If such reasonable measures could not be identified and implemented, the results of the evaluation would be published in the Federal Register with a proposed rulemaking to terminate the experimental population.

The following is a general description of the stages of growth and establishment of the experimental population, and how they will relate to the status of the California sea otter population as a whole. Figure C.1 is a schematic illustration of the stages of growth and establishment of an experimental sea otter population.

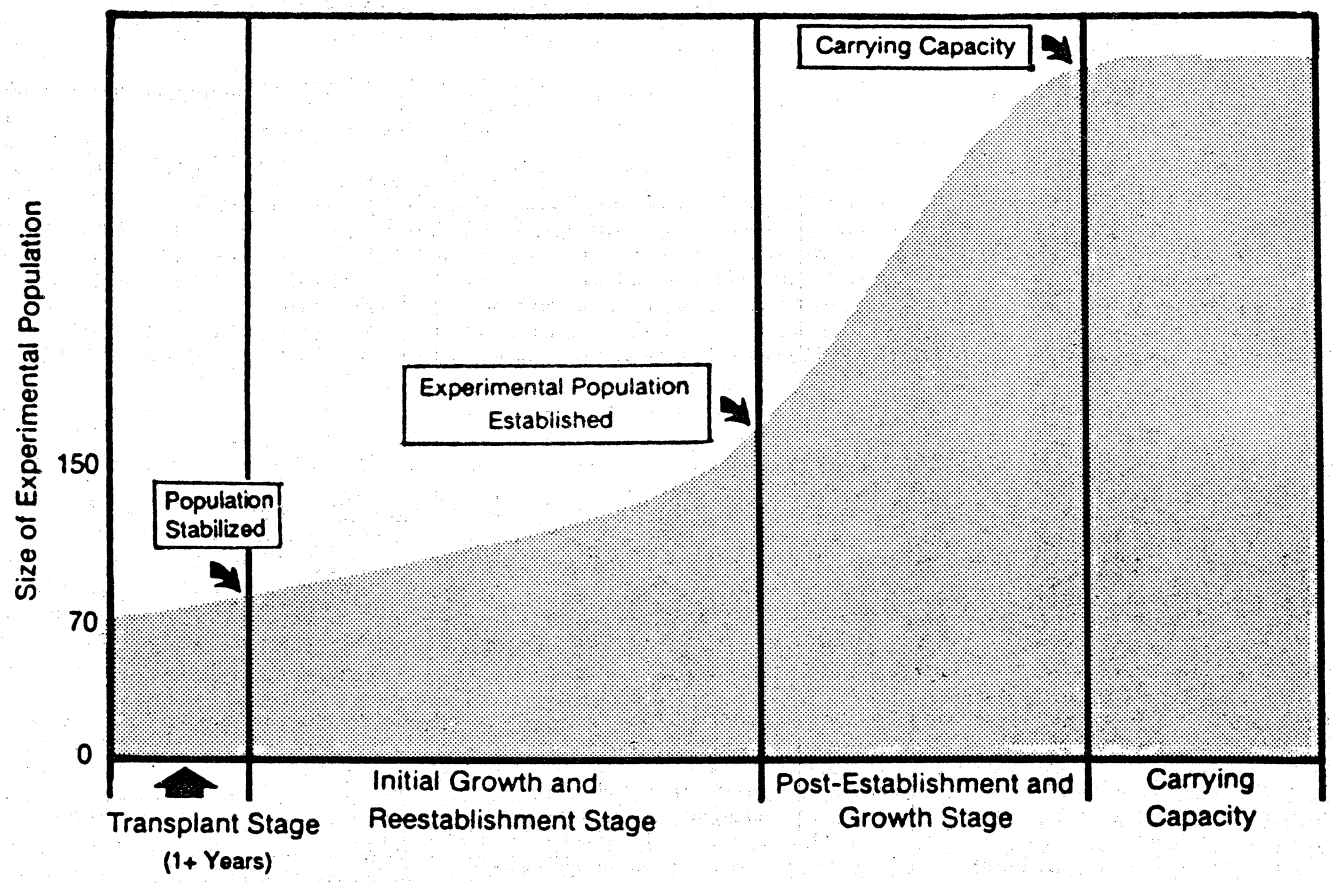

Figure C.1. Stages of establishment and growth of an experimental population of sea otters.

1. Transplant Stage

This constitutes the approximately one-year period during which sea otters from the parent population will be actively captured and relocated to the translocation site. Up to 70 otters will be moved to the site during the first year, supplemented as necessary with no more than 70 individuals in any subsequent year, although numbers in subsequent years are expected to be much less than 70. If, as expected, most of the translocated otters remain within the translocation zone until population growth due to natural reproduction can be demonstrated, there will be no supplemental translocation to the site in subsequent years except for occasional small numbers (up to five per year) to provide for genetic exchange with the parent population. However, if a substantial decline is seen in the population or a serious imbalance in the sex ratio occurs, additional otters may be moved to the site in subsequent years. Translocation will not exceed an annual maximum of 70 or a total of 250 sea otters. Based on this strategy, and if a sufficient mix of healthy male and female otters (equal to or greater than the number of otters that were released from the holding pens, or 70 otters, whichever is less) exists within the translocation zone and are apparently sedentary and showing little or no sign of dispersing from the zone, the transplant period will end. The population would thus be considered "stabilized" and is expected to enter into the initial growth and reestablishment stage. This could occur after the first year or perhaps later if supplements are necessary. A status review of the parent population, comparable to the five-year reviews required by the ESA, will be conducted near the beginning of translocation to serve as a baseline for evaluating recovery progress.

2. Initial Growth and Reestablishment Stage

This comprises the period between the end of the transplant stage (i.e., the population is stabilized) and the point at which the criteria for establishment of the experimental population are met. It is a period of intense observation of both the experimental population and the parent population. The primary focus will be to evaluate how well the new population is adapting to its new environment and, in particular, its reproduction and dispersal tendencies. It is also a period for evaluating the effects of translocation on the parent populaton, including effects on growth, range expansion or range recession. The initial growth and reestablishment period will likely be at least 5–6 years, depending on how long it takes for the nucleus of the new population to achieve the "established state" recruitment criteria and to reach a minimum estimated size of 150.

After the new population is deemed to be established, the Service will evaluate the overall success of the translocation and relate it to the recovery plan goals and criteria and the previous five-year and annual status reviews of the

population as a whole. The southern sea otter will be eligible for delisting consideration if the translocation is successful (i.e., the population established), the other recovery tasks satisfied, and the parent population is increasing and expanding its range. Upon achieving all three criteria the Service will initiate procedures for delisting. The Secretary's determination of the status of the sea otter must consider the following factors pursuant to section 4(a) of the Endangered Species Act: (1) The present or threatened destruction, modification, or curtailment of its habitat or range; (2) overutilization for commercial, recreational, scientific, or educational purposes; (3) disease or predation; (4) the inadequacy of existing regulatory mechanisms; or (5) other natural or manmade factors affecting its continued existence. Research on the experimental population and related changes in the ecosystem will continue, as will containment and maintenance of the designated management zone as otter-free by the Service and/or CDFG.

It is conceivable that, under ideal conditions, nearly all of the 15 adult females and some of the 40 females translocated as immatures could be reproducing within the first 2–3 years of the initial growth and reestablishment stage; however, the new population could not be deemed established until a minimum population estimate of 150 in combination with a minimum annual recruitment of 20 for at least 3 of the last 5 years had been achieved. If recruitment and population growth did not occur at this rate initially, the period of initial growth and reestablishment would continue until the criteria for establishment were met, or until it was determined that the experimental population had failed. The translocation is designed to maximize the chance of success, thus, it is likely that the experimental population will become established relatively quickly after completion of the transplant phase.

The Service does not consider the mere presence of sea otters in the translocation zone as an indication that a new population is established. If a catastrophic event were to decimate a portion of the parent population, it is possible that the relocated otters could be used to restore the damaged portion of the parent population; however, it would also likely eliminate the value of the new population to serve as a reserve colony for providing stock to restore subsequently damaged areas and it could eliminate the reproductive viability of the colony such that the remaining animals could not be self-sustaining. Therefore, to be considered established it must be a reproductively viable unit, capable of maintaining itself even if 25 animals are removed each year for 1 to 3 years or replacement yield is sufficient to maintain the experimental population at or near carrying capacity during the post-establishment and growth phase or carrying capacity phase for purposes of repairing damage to the parent population. Ultimately, the translocation zone should have a carrying capacity capable of supporting a population large enough to supply at least 25 mostly immature animals yearly on a sustained basis for purposes of repopulating areas of the existing range in the event that a catastrophic event decimates a portion of the parent population.

A single additional reproductively viable population of sea otters could be sufficient for recovery of the species pursuant to ESA. Thus, it is possible that recovery and delisting could occur with a single successful translocation, assuming that other recovery tasks are satisfied.

3. Post-Establishment and Growth Phase

This is the period after the experimental population is deemed established and actively growing toward the carrying capacity of the habitat within the translocation zone. During this period, intensive research and monitoring will continue in order to document changes in the nearshore ecosystem of the translocation zone, and the behavior, reproduction, and dispersal tendencies of otters in the experimental population.

During the post-establishment and growth stage, the experimental population will contribute to the total size of the California sea otter population and its numbers and location will be added to those of the parent population when describing the population size and distribution of the California sea otter for any purpose.

Under the current approved recovery plan, recovery criteria are not defined in terms of specific population goals, but, rather, by the need to establish at least one additional colony and protect the existing mainland population in California. Because establishment of the experimental population, along with achievement of other recovery plan goals, could be sufficient to consider delisting from the threatened species list, the addition of otters during the post-establishment and growth stage of the experimental population normally would not influence the overall status of the California sea otter for ESA purposes since this component of the recovery plan would have been satisfied upon the experimental population becoming established. However, if a catastrophic event were to decimate all or a large part of the parent population, the size of the experimental population would be a factor in determining whether or not the California sea otter should remain listed as "threatened" or reclassified as "endangered."

4. Carrying Capacity

This represents the point at which the experimental population reaches the carrying capacity of its habitat, defined as an ecological state in which the numbers of animals remain relatively constant and in balance with the available food supply (assuming that population growth is limited by food availability), also referred to as "equilibrium density." It is expected that, as the new population approaches carrying capacity, the growth rate will decline, the dispersal tendency of some otters may increase, natural juvenile mortality will accelerate, the time spent foraging by the otters will increase significantly, and the diet will become measurably more diversified. At this point, the growth rate of the colony might have slowed or even stopped.

Attainment of an equilibrium density in the experimental population will not necessarily influence the legal status of the southern sea otter population for purposes of ESA, beyond that which occurs at the time the new colony is deemed established. This is because the initial establishment of the experimental population will be sufficient to consider delisting if the other recovery tasks have been met.

To summarize the relationship of translocation to the status of the California sea otter pursuant to ESA, this relationship will be time-phased and will vary with the stages of growth of the translocated population. The recovery plan states that in order for recovery and delisting from the Federal list of endangered and threatened species to occur, a number of criteria must be met. A key one is that at least one additional population must be established outside the current range but separated from the existing population such that it would not be possible for a large oil spill to contact and decimate both the new colony (or colonies) and the existing population. The definition of "established" is pivotal to a description of the relationship to the population as a whole. The experimental population will not be sufficient to meet one of the criteria for delisting under ESA until the Service deems the new population to be established. The minimum time required will probably be

five years after the actual translocation begins, and it may be longer, depending primarily on the recruitment and mortality rates and the degree to which the experimental otters remain within the translocation zone. Both the transplant and initial growth and reestablishment stages must occur before the new population can be judged to be established. During these two stages, the experimental population will have no influence on, nor help to improve, the legal status of the southern sea otter under ESA, although during the initial growth and reestablishment stage the number of otters within the translocation zone will be added to those in the donor population for purposes of conducting ESA section 7 consultations if there are at least as many otters in the zone as were moved there during the transplant stage and if successful reproduction is occurring in the translocation zone.

Once the new population is deemed established, removal of the southern sea otter from the threatened list could be considered, although delisting will depend on the degree to which other recovery criteria have also been met. The Service will conduct a formal status review relative to the donor population near the beginning of translocation, and again at the time the experimental population is deemed established. This would provide the basis for evaluating the requisite factors to be considered prior to delisting the species.

An example of the conditions that may constitute meeting the recovery objectives is if: (1) The donor population has for the most part been consistently increasing in range and number (above the 1982 baseline); (2) the level of oil spill and related risks is minimized; (3) an oil spill response plan has been implemented and does afford measurable protection (i.e., good likelihood of capturing, cleaning, and rehabilitating oiled sea otters, and a good likelihood of containing and cleaning up an oil spill); (4) incidental take, vandalism, and harassment have been minimized; (5) habitat quality and biological parameters are not adversely changing to the detriment of the population; and (6) the experimental colony is determined to be established. This should achieve the desired goal for sea otter recovery, i.e., that the California sea otter population is naturally capable of withstanding perturbations of an environmental or man-caused nature.

Subsequent to the population becoming established as a viable breeding colony, it is anticipated that it would enter a growth stage, during which it would grow toward carrying capacity. During the post-establishment and growth stage, and at carrying capacity, the experimental population normally will influence the legal status (pursuant to ESA) of the overall California population no more than when it was initially deemed to be established, but the size and health of the experimental population will be a significant factor in evaluating whether the level of threat to the species continues to warrant listing under the ESA. One potential deviation from this would be if the parent population were to be substantially diminished; should that occur, the size of the experimental population at that point would have a bearing on whether the remaining sea otters remain classified as threatened or should be reclassified as endangered, or relisted if a delisting action had previously been completed.

Relationship to Future ESA Section 7 Determinations

The discussion, terms, and conclusions described under the previous section are directly applicable to this section. Pursuant to Pub. L. 99–625 formal section 7 consultations will be generally required relative to the experimental population (prior to delisting), regardless of its size or growth stage for all Federal actions that are proposed to be undertaken within the translocation zone that are not defense-related and that may affect the experimental population. Within the management zone, no formal consultations will be required for actions that may affect the experimental population (unless the action may affect the donor population), but pursuant to section 7(a)(4) the Federal agency proposing the action will be required to informally confer with the Service on projects that are likely to jeopardize the continued existence of the southern sea otter.

During the transplant and initial growth and reestablishment stages, it will not be known if the experimental population will eventually take hold and become a viable, self-perpetuating unit. Therefore, it cannot be considered as available for restoring a damaged parent population, and thus will not contribute significantly to recovery. However, for section 7 purposes, after the translocated population has stabilized and then during the growth and reestablishment stage, the numbers associated with the experimental population will be added to those of the parent population if they are at least equal to the number originally translocated to the translocation zone and successful reproduction is occurring. For example, if there are 100 sea otters in the translocation zone, at least some of which are reproducing successfully, and 1,400 in the parent population, the total population of California sea otters will be considered to equal 1,500 for purposes of evaluating a Federal project through section 7 consultation. Once the translocated otters become stabilized and enter into the initial growth and reestablishment stage, but before meeting the criteria for an established population, the experimental population will have an existence value that will be taken into consideration for section 7 purposes, both quantitatively and qualitatively. Its numbers will be added to those of the parent population in order to analyze impacts of a Federal action on the southern sea otter population as a whole. Moreover, as part of the analysis of the impacts on the population as a whole, the impacts of proposed Federal actions will be analyzed in a manner to clearly determine the relative risk to each of the two populations (parent population and experimental population). It is assumed, based on the oil spill risk analysis that was conducted for the translocation, that no single oil spill or similar event could affect both the parent population and experimental population, and it is expected that the otters present in the translocation zone will be relatively healthy, productive and well adjusted to their new environment during the initial growth and reestablishment stage.

Although the estimated size of both the parent population and experimental population will be combined for section 7 purposes, the reduction in the likelihood of a jeopardy opinion will probably be only a small fraction and probably not quantifiable. When considering adverse effects and incidental take associated with a proposed project and cumulative effects that may affect the donor population, the number of otters removed from the donor population for translocation purposes will have to be taken into consideration for projects proposed during the transplant stage. However, since only a maximum of 70 will be translocated the first year, and probably only small supplements taken if needed during subsequent years, there will not likely be any measurable effect on section 7 opinions relative to the parent population after the first year of the translocation.

Once the experimental population becomes established, but prior to the formal delisting of the southern sea otter, the existence of the experimental population will affirmatively influence

determinations of non-jeopardy, and it will be considered part of the overall southern sea otter population for section 7 purposes in direct proportion to its size. For example, if the experimental population numbered 150 and the donor population 1,300, for section 7 purposes the southern sea otter population would number 1,450, and the projected impacts from the project would be based on the proportion of the 1,450 that could be affected. In addition to simply adding the sizes of both the donor and experimental populations together, the experimental population will also be available to annually contribute at least 25 mostly immature otters for restoring a damaged donor population. This potential contribution will be factored into a section 7 biological opinion in its assessment of impacts of the proposed Federal project and the time required for the donor population to recover itself from the expected impacts of the Federal project. The fact that two viable, geographically separate populations exist at that point will reduce the likely extent of impacts from the proposed Federal action on the species as a whole and, thus, affect determinations of jeopardy and non-jeopardy pursuant to section 7.

With regard to determinations of jeopardy or non-jeopardy, as the experimental population grows toward the maximum number that its habitat can support, i.e., carrying capacity, the likelihood of jeopardy determinations for Federal actions will decrease proportionally for comparable projects with comparable types of impacts. Thus, there will be an inverse relationship between the size of the experimental population (after establishment occurs) and the likelihood of jeopardy determinations associated with section 7 consultations on projects affecting either the parent or the experimental population. Figure C.2. graphically describes this hypothetical relationship. However, the status of the experimental population is not the only factor that will be considered in section 7 evaluations. The status of the donor population, as well as the baseline environmental or population threats at the time and cumulative impacts of future non-Federal actions expected to occur and affect either population at the time of the consultation, will also be taken into account. Once the experimental population becomes established and the southern sea otter delisted, no further section 7 consultations will be required relative to either the parent or experimental populations. If a catastrophic event were to completely decimate the parent population subsequent to the species being delisted, the experimental population could be considered for re-listing as threatened or endangered, but such re-listing would follow the normal listing procedures prescribed under section 4(a) of the Endangered Species Act, including a rulemaking process and opportunity for public review and comment.

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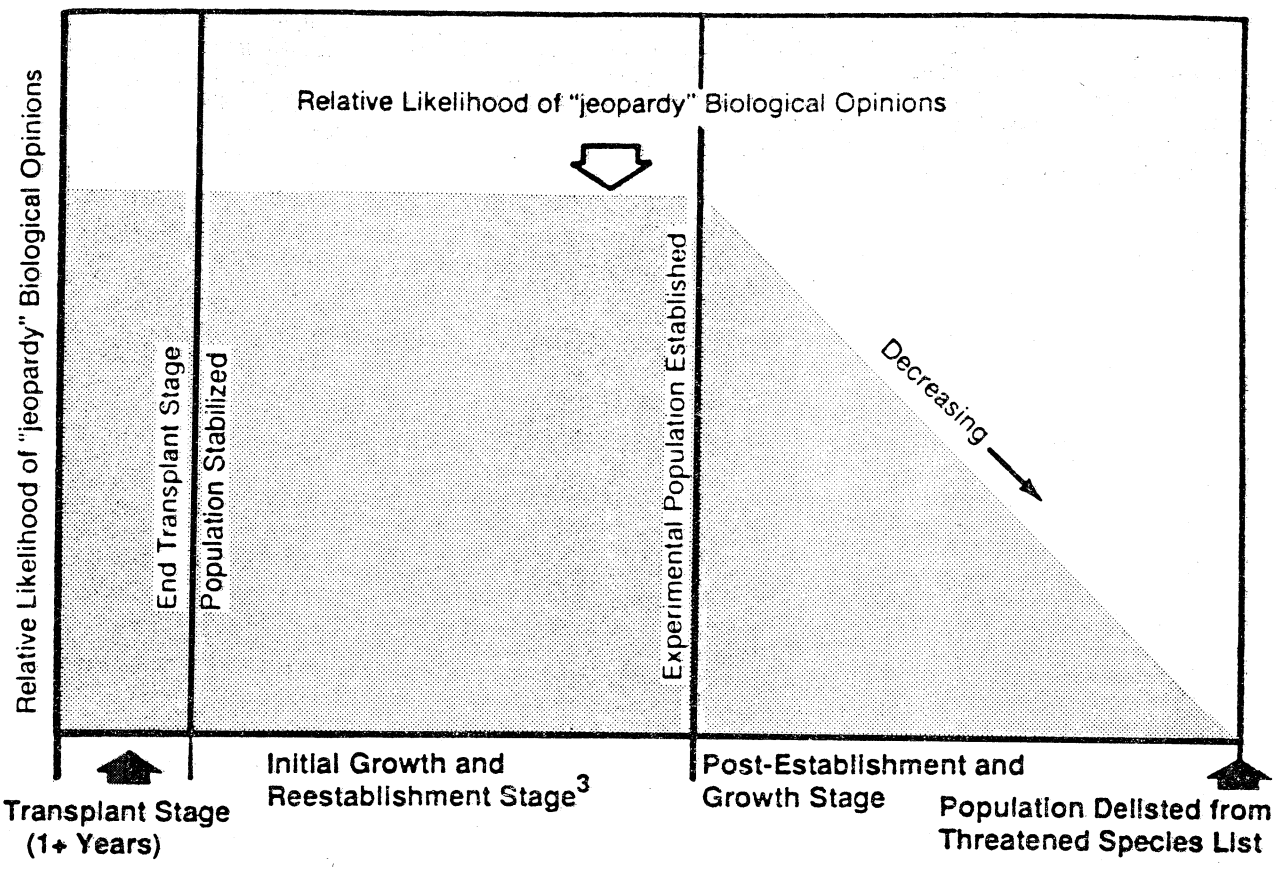

Figure C.2.
Hypothetical relationship between establishment and growth of an experimental population of southern sea otters and the relative likelihood of "jeopardy" Biological Opinions being rendered under the Endangered Species Act Section 7 consultation process.[1,2]

[1]Length of each stage on the horizontal axis does not necessarily represent real time.

[2]Actual Biological Opinions rendered would be contingent upon the magnitude of impacts expected to result from the specific project and the current status and trend of the parent (donor) population, as well as the size and status of the experimental population.

[3]During the Initial Growth and Reestablishment Stage, a measurable decrease in the likelihood of a "jeopardy" Biological Opinion is possible, depending on the the actual size and status of the experimental population, but not likely. The existence of a reproducing aggregation of otters separate from the parent population that would not be affected by impacts to parent population would be taken into consideration in Biological Opinions rendered during the Initial Growth and Reestablishment stage.

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Translocation as a Conservation Measure

Pursuant to the Congressional directive in the Committee Report (H.R. Rep. No. 99–124, 99th Cong. 1st Sess. 16 (1985)), the Service has used section 10(j)(2)(A) of the ESA as guidance in evaluating the possible effect of the translocation on the parent population. The following criteria were considered in making such an evaluation:

(1) Any possible adverse effects on extant populations of (southern sea otters) as a result of removal of individual * * * for introduction elsewhere;

(2) The likelihood that any such experimental population will become established and survive in the foreseeable future;

(3) The relative effects that establishment of an experimental population will have on the recovery of the species; and

(4) The extent to which the introduced population may be affected by existing or anticipated Federal or State actions or private activities within or adjacent to the experimental population area. 50 CFR 17.81(b).

The previous discussion on the relationship of the success of a translocation to the ultimate recovery of southern sea otters clearly shows that the successful establishment of an experimental population will further the conservation of the southern sea otter; the following discussion explains the basis for the Service's finding in accordance with the four criteria.

Although a short-term reduction in the size of the parent population of southern sea otters will result as a consequence of translocation, any adverse effects of removal of no more than 70 mostly immature otters the first year and only supplemental removals in subsequent years if needed should be temporary and diminished by natural growth and expansion of the parent population, and will be outweighed by the achievement of a primary recovery criterion that can result from a successful translocation. The short-term reduction in size of the existing (parent) population will be proportionate to or less than the numbers translocated depending on the degree to which the removal of animals compensates for some level of natural mortality in the parent population. However, the numbers, sex and age of otters removed will be carefully selected to avoid any lasting effects on the parent population. Otters will be individually caught, removed and then translocated in small groups. Up to 70 animals will be translocated the first year, with only minor supplemental translocations in subsequent years, if necessary, to help ensure that the translocated population is successfully established or for genetic exchange purposes. The number to be taken in any one year is less than the normal recruitment rate of the population. As designed in the translocation plan, monitoring of the parent population as well as the experimental population should determine the success of the first year's effort and each subsequent year's effort as well as the effect(s) on the parent population. The program will be modified or terminated if new information indicates that continuing the project may be adverse to the health and viability of the parent population of southern sea otters (e.g., the parent population is diminished by some catastrophic event prior to the transplant stage being completed).

The Service has determined that the translocation will not result in significant adverse effects on the parent population. The impacts and risks associated with translocation must be weighed against the threat of catastrophic oil spills and the associated risks to the parent population if this action is not undertaken. If the translocation is successful, one outcome would be the establishment of a new colony of southern sea otters, which would ameliorate the species' present vulnerability to oil spills that, if they occurred, could jeopardize the continued existence of the southern sea otter.

There is a strong likelihood that an experimental population of southern sea otters released at San Nicolas Island will become established within 10 years after translocation is begun, and possibly in as few as 5 years. Current information indicates that necessary habitat requirements exist around San Nicolas Island to support a viable breeding colony of sea otters, and, although further field research would be of benefit in assessing particular habitat needs and population dynamics of a translocated population, the Service believes that the prospects for a successful translocation are excellent.

Since 1965, translocation of Alaskan sea otters has been successfully used for restoration purposes in southeast Alaska, northern Washington, and the Canadian Province of British Columbia. Although early efforts to translocate Alaskan otters to St. George Island (Pribilof Islands) failed, their failure is attributed mainly to inexperience in transportation, care, and limited knowledge of physiological requirements of sea otters and the harsh ice conditions that occurred around the Island after translocation was carried out. The procedural problems have since been rectified (via research studies and modification in care and transportation techniques) as illustrated by subsequent, successful releases in other areas. Alaskan sea otters were successfully released in Oregon; however, subsequent monitoring studies noted a decline in number (although pupping had occurred) and a concurrent movement of at least some of the animals northward. These animals may have merged into translocated populations of Alaskan otters to the north. The Service has evaluated past translocation success in developing procedures to maximize the likelihood of successful release and establishment of southern sea otters. Effective, humane techniques for capturing, relocating and releasing sea otters now exist. The Service anticipates that translocation and colony establishment will likely occur with little or no abnormal mortality.

The preceding discussion on the effects of translocation on the recovery of southern sea otters clearly shows that the establishment of an experimental population of otters is essential to the recovery of the species. The factors outlined earlier in the preamble, in the section entitled "Effects on Recovery and ESA Section 7 Determinations," have been considered by the Service in reaching the conclusion that the establishment of a new sea otter colony—one that is not subject to the same risk of loss faced by the parent population from a catastrophic oil spill—will improve the recovery potential for the southern sea otter.

Lastly, although some Federal, State, and private activities on and near San Nicolas Island could affect the experimental population, these impacts are expected to be minor, if they occur at all. Appropriate measures are proposed to protect the translocated otters from more serious threats. Despite the fact that the experimental population will not be risk-free, the Service finds that, after balancing all relevant factors, the translocation will further the conservation of southern sea otters.

San Nicolas Island is within the boundary of the Southern California oil and gas outer continental shelf (OCS) lease offering area (Point Buchon to the California-Mexico border). The Department of the Interior, Minerals Management Service has offered lease sales for tracts in this general area in 1966, 1968, 1975, 1979, 1982, and 1984. The next proposed sale that could include the San Nicolas Island area is scheduled for 1989. If tracts around the Island were leased, it is unlikely that

development would occur before 1992 since an exploratory program would be conducted first to determine if any recoverable reserves are present. The oil and gas industry has expressed some interest in the general area (i.e., the outer banks and basins); however, tracts offshore San Nicolas Island have been regularly deleted from previous sales to avoid potential military (Navy) conflicts. Naval activities on and around San Nicolas Island include automated tracking of missiles and submarines with some infrequent nearshore field exercises that involve firing of live ammunition in limited areas. To date, such activities have not adversely affected the sizeable populations of other marine mammals that inhabit waters near the island. Because the Service will coordinate with the Navy in developing a Memorandum of Understanding for operations on the Island, and if Naval activities are likely to jeopardize the southern sea otter the Service will enter into informal conferral on Navy activities pursuant to section 7(a)(4) of the ESA, the Service believes military activities will not pose significant threats to the reintroduced colony. The closest blocks with active oil and gas leases are located about 30 miles northwest of San Nicolas Island. Deletions are made on a lease sale-by-lease sale basis and, therefore, withdrawal of tracts around the Island from future sales is not a certainty. Oil development in waters immediately surrounding San Nicolas Island could significantly affect the introduced colony if an oil spill were to occur, but in view of the conflict between OCS development and military activities in the area and the outcomes of previous lease sales around San Nicolas, it is doubtful that development in the immediate vicinity will occur in the foreseeable future. Furthermore, proposed oil development plans within the translocation zone would be subject to formal ESA section 7(a)(2) consultation with the Service, a requirement that would likely ensure that the development would not jeopardize the continued existence of the species and would minimize any possible incidental take. To date, there has been no interest expressed by the State to lease tidelands around San Nicolas Island for oil development. The State has designated the waters surrounding San Nicolas Island an Area of Special Biological Significance (ASBS). The State and Regional Water Resources Control Boards prohibit the direct discharge of wastes into an ASBS or its immediate vicinity, petroleum discharges included. This designation provides an added measure of protection to sea otters at San Nicolas Island.

A State-controlled action that may affect southern sea otters is the setting of commercial gill and trammel fishing nets in sea otter habitat. Sea otters have been incidentally entangled and drowned in large-mesh set nets that are typically used to catch halibut in their present range. Mortality in these nets has, until recently, resulted in the average annual loss of about 6 percent of the population (an average of 80 otters per year, 1982–84). The effect this activity would have on a reintroduced colony is expected to be minimal because the State has taken a position that areas where such incidental taking of sea otters might occur will be closed to fishing with this type of gear. In view of previous actions by the CDFG and State Legislature, it is reasonable to believe that the State will close any area where sea otters are translocated out to a depth of at least 15 fathoms (the depth that SSO's normally inhabit) or farther if necessary to eliminate sea otter entanglement. Enforcement of such closures would be carried out by State agents, and Service agents would enforce the prohibition against incidentally taking sea otters around San Nicolas Island. If the State did not close the portion of the translocation zone that otters would inhabit to such fishing activities, the prohibition against incidental take under Pub. L. 99–625 would still be enforceable by the Service.

It also is important to recognize that an unknown number of southern sea otters in their present mainland range are illegally shot annually. Sea otters off San Nicolas Island will be vulnerable to this malicious act if specific measures are not taken to prevent it. Although no individuals have yet been convicted for shooting otters in the currently occupied range, the relatively small size, isolation, and difficult access to San Nicolas Island, and the intense research, monitoring and law enforcement effort designed to protect this experimental population should minimize or eliminate the likelihood that otters will be illegally taken there.

National Environmental Policy Act (NEPA)

A Final Environmental Impact Statement pursuant to NEPA is now available to the public at the Regional Office and Office of Sea Otter Coordination, U.S. Fish and Wildlife Service, at the address listed above.

Formal Consultation

As required by section 7(a)(2) of the ESA, the Service has concluded formal consultation on translocation of southern sea otters to San Nicolas Island. The biological opinion states that the proposed translocation is not likely to jeopardize the continued existence of southern sea otters.

Executive Order 12291, Paperwork Reduction Act and Regulatory Flexibility Act

The Service has determined that this is not a major rule as defined by Executive Order 12291, that the rule will not have a significant economic effect on a substantial number of small entities as described in the Regulatory Flexibility Act, 5 U.S.C. 601 *et seq.*, and that the rule does not contain any information collection or record keeping requirements as defined in the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 *et seq.* These conclusions were reached after conducting an analysis that is documented in a Determination of Effects of Rules, which is on file and available for public review at the address listed under "For Further Information Contact."

The translocation of southern sea otters to San Nicolas Island, may cause economic impacts to commercial and sport fisheries; oil and gas exploration, development and production; mariculture; and commercial kelp harvest. However, the total economic impacts of this action, on an annual basis, will be substantially less than $100 million, and there will not be a major increase in costs or prices for consumers, individual industries, Federal, State or local governmental agencies, or geographic regions as a result of implementation of this Rulemaking. Lastly, the rule does not generate significant adverse effects to competition, employment, investment, productivity, innovation, or to the ability of domestic enterprises to compete with foreign enterprises in domestic or international markets.

Literature Cited

Ames, J.A., R.H. Hardy, and F.E. Wendell. 1983. Tagging materials and methods for sea otters, *Enhydra lutris* Calif Fish and Game 69:243–252.

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Hofman, R.J. (Ed.). 1985. Workshop to assess possible methods for regulating the distribution and movements of sea otters. U.S. Marine Mammal Commission. Rept. No. MMC–84/05. Washington, DC.

Jameson, R.J., K.W. Kenyon, A.M. Johnson, and H.M. Wight. 1982. History and status of translocated sea otter populations in North America. Wildl. Soc. Bull. 10(2):100–107.
Kenyon, K.W. 1969. The sea otter in the eastern Pacific Ocean. N. Amer. Fauna 68:1–352.

Authors

The primary authors of this rule are Wilbur Ladd and Carl Benz, Office of Sea Otter Coordination, U.S. Fish and Wildlife Service, Room E–1818, 2800 Cottage Way, Sacramento, California 95825 (916/978–4873, FTS 460–4873).

List of Subjects in 50 CFR Part 17

Endangered and threatened wildlife, Marine mammals, Fish, Plants (agriculture).

Regulation(s) Promulgation

Accordingly, Part 17, Subchapter B of Chapter I, Title 50 of the Code of Federal Regulations, is hereby amended as set forth below:

PART 17—[AMENDED]

1. The authority citation for Part 17 is revised to read as follows:

Authority: Pub. L. 93–205, 87 Stat. 884; Pub. L. 94–359, 90 Stat. 911; Pub. L. 95–632, 92 Stat. 3751; Pub. L. 96–159, 93 Stat. 1225; Pub. L. 97–304, 96 Stat. 1411 (16 U.S.C. 1531 *et seq.*); Pub. L. 99–625, 100 Stat. 3500 (1986), unless otherwise noted.

2. § 17.11(h) is amended by revising the entry for "Otter, southern sea" under MAMMALS in the list of endangered and threatened wildlife as follows:

§ 17.11 Endangered and threatened wildlife.

* * * * *

(h) * * *

Species		Historic range	Vertebrate population where endangered or threatened	Status	When listed	Critical habitat	Special rules
Common name	Scientific name						
MAMMALS							
Otter, southern sea	*Enhydra lutris nereis*	West Coast, USA (WA, OR, CA) south to Mexico (Baja, California).	Entire, except where listed below	T	21, 284	NA	NA
Do	do	do	All areas subject to U.S. jurisdiction south of Pt. Conception, CA (34°26.9' N. Lat.) [Note: status governed by Pub. L. 99–625, 100 Stat. 3500.].	[See 17.84(d)]	21, 284	NA	17.84(d)

3. Section 17.84 is amended by adding paragraph (d) as set forth below:

§ 17.84 Special rules—Vertebrates.

* * * * *

(d) Southern sea otter (*Enhydra lutris nereis*).

(1) *Definitions.* The definitions set out in § 17.3 apply to this paragraph (d). For purposes of this paragraph—

(i) The term "defense-related agency action" means an agency action proposed to be carried out directly by a military department, which does not have as its intended purpose the taking of southern sea otters. For purposes of this definition, the United States Coast Guard is not a military department.

(ii) The term "management zone" means that area delineated in paragraph (d)(5)(i) of this section which surrounds the translocation zone and separates the translocation zone from the existing range of the parent population and adjacent range where expansion of the parent population is necessary for the recovery of southern sea otters.

(iii) The term "member of the experimental population of southern sea otters" includes any southern sea otter, alive or dead, found within the translocation zone or the management zone, and any part or product of any such southern sea otter.

(iv) The term "parent population" means the population of southern sea otters existing along the central California coast north of the management zone.

(v) The term "translocation zone" means the area delineated in paragraph (d)(4)(i) of this section within which an experimental population of southern sea otters is released and contained.

(vi) The term "established experimental population of southern sea otters" means a translocated population that meets the following criteria: An estimated combined minimum of 150 healthy male and female sea otters residing within the translocation zone, little or no emigration into the management zone occurring, and a minimum annual recruitment to the experimental population in the translocation zone of 20 sea otters for at least 3 years of the latest 5-year period, or replacement yield sufficient to maintain the experimental population at or near carrying capacity during the post-establishment and growth phase or carrying capacity phase of the experimental population.

(vii) The term "stabilized population" is a population of sea otters within the translocation zone at the conclusion of the movement of animals from the parent population, except for purposes of genetic enhancement, which (A) is equal to or greater than the number of otters that were released from the holding pens alive and healthy, or 70 otters, whichever is less, and (B) is exhibiting growth. A stabilized population would represent the point at which the experimental population shifts from the transplant stage to the initial growth and reestablishment stage.

(viii) The term "carrying capacity" means the ecological state in which the numbers of sea otters within the translocation zone remain relatively constant and in balance with the available food supply.

(2) *Description of experimental population.* The experimental population of southern sea otters shall include all southern sea otters found within the translocation zone or the management zone. The Service will translocate no more than 70 southern sea otters during the first year, supplemented as necessary with up to 70 otters per year in subsequent years from the parent population to the translocation zone. Although a maximum of 250 southern sea otters may be moved from the parent population in order to establish the experimental population in the translocation zone, it is not likely that supplemental translocation after the initial 70 will involve more than small numbers of southern sea otters, although under this plan a maximum of 70 could be moved if needed in each year up to a total of 250. Of the animals translocated each year, up to 20 will be adults, at a sex ratio of about 3:1, females to males. The remainder will be weaned, immature otters. The sex ratio of the immature otters selected for translocation will be approximately 4 females to 1 male.

(3) *Translocation process.* (i) *Capture.* Capture locations will be selected primarily from the southern third of the range of the parent population. Sea

otters will be captured between early August and mid-October using: diver-held devices, dip nets, surface entangling nets, or other methods which may be proven to be safe and effective in the future. All captured otters will be tagged and examined by a veterinarian experienced in treating marine mammals. During the year prior to each translocation effort, a maximum of 30 otters will be captured and implanted with radio transmitters for observation and study of behavior. Up to 15 of these animals will be recaptured and translocated.

(ii) *Transport.* All animals to be translocated will be held in specially constructed holding facilities prior to their movement to the translocation zone. Access to and care of animals will be restricted to Federal and State personnel and designated agents directly involved with the translocation. Each captured animal will be placed in a carrying cage and transported by truck to the local airport, from which point they will be flown to the translocation zone. From there they will be trucked to the release site. No fewer than 20 animals will be moved to the translocation zone at a single time.

(iii) *Release.* The animals will be held for up to five days in secured floating pens at the release site. No more than 10 individuals will be held in any pen, and males and females will be held separately. The animals will be released passively by opening the floating pens and allowing them to leave at will.

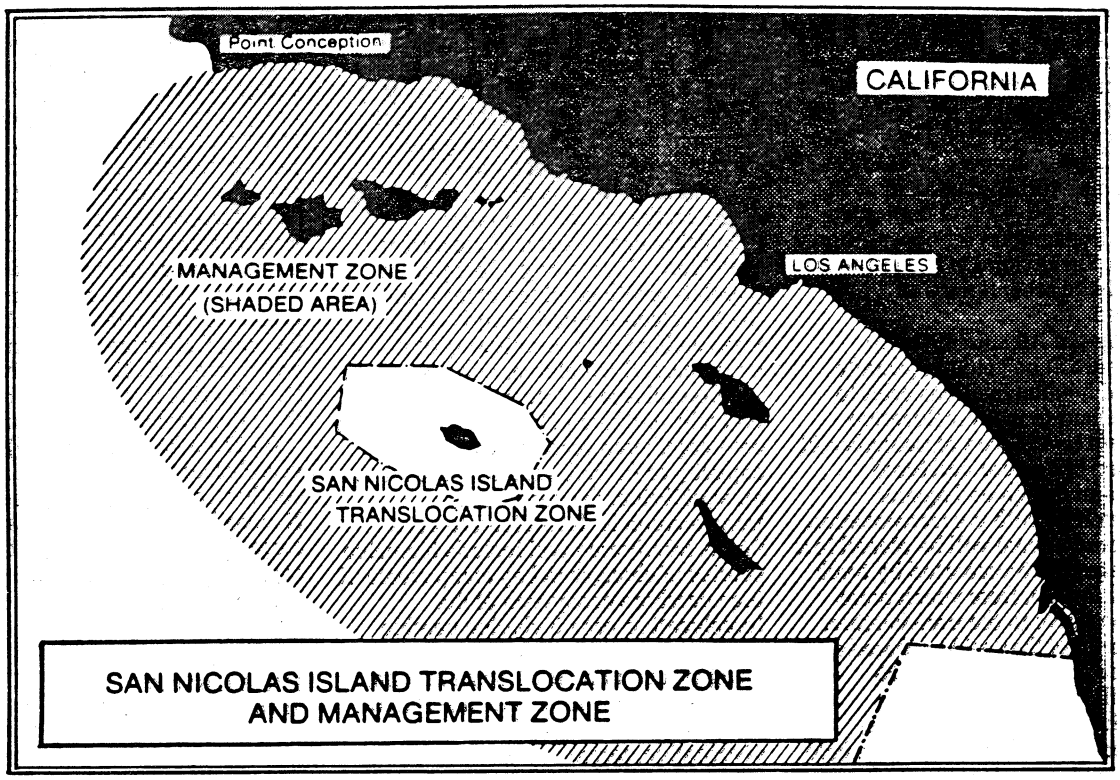
(iv) *Monitoring.* Monitoring will be conducted on both the parent population and the experimental population by State and Federal biologists and their designated agents. Monitoring the parent population will be done to determine the effects of removal of otters on the growth and range expansion or recession of the parent population. Monitoring of the parent population will continue at least through the translocation period and into the foreseeable future. Monitoring of the experimental population will begin with the first release of translocated otters and will continue at least until either the new population reaches the carrying capacity of the habitat and establishes an equilibrium density or the translocation is determined to have failed. Monitoring will include intensive studies of changes in key components of the nearshore ecosystem of the translocation zone including benthic organisms, kelp and finfish. Monitoring, using ground and aerial observations, will also include intensive observation and documentation of the movements, distribution, foraging and reproductive behavior, dispersal tendencies, growth and reproductive rates, prey selection, and social interactions of sea otters in the experimental population. Results of monitoring the experimental population and the parent population will also be compared and evaluated.

(v) *Protection.* At least two law enforcement officers will be specifically assigned, at least for the initial three- to five-year period after the actual translocation of animals, to conduct patrols and prevent illegal taking of southern sea otters in the translocation zone. Cooperative enforcement arrangements will be developed with other agencies having law enforcement activities in the area such as the U.S. Coast Guard, National Marine Fisheries Service, California Department of Fish and Game, U.S. Navy, and National Park Service to assist with protecting the experimental population.

(4) *Translocation zone.* (i) There is established a translocation zone for southern sea otters comprised of San Nicolas Island, Begg Rock, and the surrounding waters within the following coordinates:

N. Latitude/W. Longitude
33°27.8′/119°34.3′
33°20.5′/119°15.5′
33°13.5′/119°11.8′
33°06.5′/119°15.3′
33°02.8′/119°26.8′
33°08.8′/119°46.3′
33°17.2′/119°56.9′
33°30.9′/119°54.2′

(ii) A map depicting the translocation zone is set forth below:



SAN NICOLAS ISLAND TRANSLOCATION ZONE AND MANAGEMENT ZONE

Translocation Zone Coordinates: (North Latitiude/West Longitude)	Management Zone:
33°27.8'/119°34.3', 33°20.5'/119°15.5' 33°13.5'/119°11.8', 33°06.5'/119°15.3' 33°02.8'/119°26.8', 33°08.8'/119°46.3' 33°17.2'/119°56.9', 33°30.9'/119°54.2'	All U.S. areas south of Point Conception (34°26.9' N. Latitude) except the translocation zone.

(iii) *Prohibitions.* Except as provided in paragraph (d)(4)(iv), all of the provisions in § 17.21 (a) through (f) shall apply to any member of the experimental population of southern sea otters within the translocation zone.

(iv) *Exceptions.* The prohibitions of paragraph (d)(4)(iii) shall not apply to:

(A) Any act by the Service, the California Department of Fish and Game, or an authorized agent of the Service or the California Department of Fish and Game that is necessary to effect the relocation or management of any southern sea otter under the provisions of this paragraph;

(B) Any taking of a member of the experimental population of southern sea otters that is incidental to, and not the purpose of, the carrying out of a defense-related agency action as defined in paragraph (d)(1)(i) of this section; or

(C) Any act authorized by a permit issued under § 17.32.

(5) *Management zone.* (i) There is established a management zone for southern sea otters comprised of all waters, islands, islets, and land areas seaward of mean high tide subject to the jurisdiction of the United States located south of Point Conception, California (34°26.9' N. Latitude), except for any area within the translocation zone delineated in paragraph (d)(4)(i) of this section.

(ii) A map depicting the management zone is set forth in paragraph (d)(4)(ii) of this section.

(iii) *Prohibitions.* Except as provided in paragraph (d)(5)(iv), all of the provisions in § 17.21 (a) through (f) shall apply to any member of the experimental population of southern sea otters within the management zone.

(iv) *Exceptions.* The prohibitions of paragraph (d)(5)(iii) shall not apply to:

(A) Any act by the Service, the California Department of Fish and Game, or an authorized agent of the Service or the California Department of Fish and Game that is necessary to effect the relocation or management of any southern sea otter under the provisions of this paragraph;

(B) Any taking of a member of the experimental population of southern sea otters that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity within the management zone delineated in paragraph (d)(5)(i) of this section; or

(C) Any act authorized by a permit issued under § 17.32.

(6) *Containment.*—The following containment measures, listed in order of preference, will be employed to prevent significant emigration of southern sea otters from San Nicolas Island and occupation of habitat within the management zone:

(i) Capture of animals within the management zone for return to the experimental population or to the range of the parent population using non-lethal means. If verified sightings of one or more sea otters are made at any location within the management zone, field crews will be mobilized as soon as weather and sea conditions permit, to capture and remove the otter(s) from the zone. Capture will be done by experienced State and/or Federal personnel or other designated agents, using one or more of the same techniques used in the translocation effort, such as diver-held devices; surface entangling nets; dip nets; or other effective methods which may be developed for capturing sea otters in the future. Animals either will be flown or moved by air-conditioned van to the release site.

(ii) Artificial reduction of fecundity for some sea otters within the experimental population. [Reserved]

(iii) Selective or random, non-lethal removal of members of the experimental population within the translocation zone. [Reserved]

Containment measures will be administered by the Fish and Wildlife Service's Office of Sea Otter Management and Coordination (OSOMC), in consultation and cooperation with the California Department of Fish and Game. The OSOMC will work closely with State biologists to remove otters from the management zone. Federal funding received through the normal appropriations process will be used for research, protection, and containment of the experimental population. Grants to the State of California under 16 U.S.C. 1535, may be employed to facilitate the measures outlined above. Public donations for management and containment of the experimental population will be accepted with assistance from the National Fish and Wildlife Foundation.

(7) *Effects of translocation on recovery and interagency cooperation.*—(i) *Background.* The Recovery Plan specifically describes the importance of translocation to the delisting of the southern sea otter under the Endangered Species Act. The Plan states:

> Sea otter translocation, if properly designed and implemented, should provide the necessary foundation for ultimately obtaining the Recovery Plan's objective and restoring the southern sea otter to a non-threatened status and maintaining OSP by: (i) Establishing a second colony (or colonies) sufficiently distant from the present population such that a smaller portion of southern sea otters will be jeopardized in the event of a large-scale oil spill, and (ii) establishing a data base for identifying the optimal sustainable population level for the sea otter.

Thus the translocation, and establishment of a population of sea otters has been identified by the Recovery Plan as a critical action necessary for the recovery and delisting of the species. With regard to the relationship of a successful translocation to the initiation of a delisting action under the Endangered Species Act. The Plan states:

> Delisting should be considered when the southern sea otter population is stable or increasing at sustainable rates in a large enough area of their original habitat that only a small proportion of the population would be decimated by any single natural or man-caused catastrophe. To reach this point: 1) At least one additional population of sea otters must be established outside the current population range, 2) the existing population of sea otters and its habitat must be protected, and 3) the threat from oil spills or other major environmental changes must be minimized.

The successful establishment of the experimental population to be carried out pursuant to this rule should fully satisfy the first criterion specified above from the Recovery Plan, provided that the parent population is showing sustained growth and expanding its range from its present size and distribution. However, if such growth and expansion is not occurring, the establishment of a single new population may not be sufficient to satisfy the broader criterion that the population must be increasing at a sustainable rate in a large enough area of their original habitat that only a small proportion of the population would be decimated by any single natural or man-caused catastrophe.

(ii) *Effect on recovery.* The translocation will not influence the legal status of the species until such time as the Service determines that the experimental population is established. Once established, other factors such as the status of the parent population and completion of other recovery tasks will be considered. If the experimental population becomes established and the other recovery tasks identified in the recovery plan for the southern sea otter are attained, the southern sea otter will be eligible for consideration for delisting in accordance with the requirements of 50 CFR 424.11(d). If a catastrophic event were to significantly diminish the parent population, the size of the experimental population would be a factor in determining whether or not the southern sea otter should remain listed as "threatened" or reclassified as "endangered," or if relisting should be considered if a delisting action had been completed.

(iii) *Effect on interagency cooperation.* In determining the likelihood of jeopardy or non-jeopardy opinions for proposed Federal actions that "may affect" southern sea otters, the probability of jeopardy determinations will decrease proportionally for comparable projects with comparable types of impacts as the experimental population grows from the point of being established toward the maximum number that its habitat can support, i.e., carrying capacity. Thus, there is an inverse relationship between the size of the experimental population (after being determined to be established) and the probability of jeopardy determinations associated with section 7 consultations under the Endangered Species Act for projects affecting either the parent or the experimental population. However, the status of the experimental population is not the only factor to be considered in section 7 evaluations. The status of the parent population, as well as the cumulative impacts, baseline level of threats, and effects of the action on either population, will also be taken into account. In addition to considering the size of the experimental population, the contribution that such population could make toward helping restore a damaged parent population will also be a factor that will be considered during section 7 evaluations. For section 7 purposes, once the translocated otters become stabilized and enter into the initial growth and reestablishment stage, but before meeting the criteria for an established population, the experimental population will have an existence value that will be taken into consideration both quantitatively and qualitatively. Its numbers will be added to those of the parent population for purposes of analyzing the impacts of a Federal action on the southern sea otter population. Moreover, during the initial growth and reestablishment stage, as part of the analysis of the impacts on the population as a whole, the impacts of proposed Federal actions will be analyzed to clearly determine the relative risk to each of the two populations (parent population and the experimental population).

(8) *Determination of a failed translocation.*—The translocation would generally be considered to have failed if one or more of the following conditions exists:

(i) If, after the first year following initiation of translocation or any subsequent year, no translocated otters remain within the translocation zone and the reasons for emigration or mortality cannot be identified and/or remedied;

(ii) If, within three years from the initial transplant, fewer than 25 otters remain in the translocation zone and the reason for emigration or mortality cannot be identified and/or remedied;

(iii) If, after two years following the completion of the transplant phase, the experimental population is declining at a significant rate and the translocated otters are not showing signs of successful reproduction (i.e., no pupping is observed); however, termination of the project under this and the previous criterion may be delayed if reproduction is occurring and the degree of dispersal into the management zone is small enough that the efforts to continue to remove otters from the management zone are acceptable to the Service and California Department of Fish and Game;

(iv) If the Service determines, in consultation with the affected State and Marine Mammal Commission, that otters are dispersing from the translocation zone and becoming established within the management zone in sufficient numbers to demonstrate that containment cannot be successfully accomplished. This standard is not intended to apply to situations in which individuals or small numbers of otters are sighted within the management zone or temporarily manage to elude capture. Instead, it is meant to be applied when it becomes apparent that, over time, otters are relocating from the translocation zone to the management zone in such numbers that: (A) An independent breeding colony is likely to become established within the management zone, or (B) they could cause economic damage to fishery resources within the management zone. It is expected that the Service could make this determination within a year provided sufficient information is available;

(v) If the health and well-being of the experimental population should become threatened to the point that the colony's continued survival is unlikely, despite the protections given to it by the Service, State, and applicable laws and regulations. An example would be if an overriding military action for national security was proposed that would threaten to devastate the colony and removal of the otters was determined to be the only viable way of preventing the loss of the individuals.

(vi) If, based on any one of these criteria, the Service concludes, after consultation with the affected State and Marine Mammal Commission, that the translocation has failed to produce a viable, contained experimental population, this rulemaking will be amended to terminate the experimental population, and all otters remaining within the translocation zone will be captured and all healthy otters will be placed back into the range of the parent population. Efforts to maintain the management zone free of otters will be curtailed after all reasonable efforts have been made to remove all otters that are still within the management zone at the time of the decision to terminate the translocated population. A joint State-Service consultation will determine when all reasonable efforts have been made and additional efforts would be futile.

(vii) Prior to declaring the translocation a failure, a full evaluation will be conducted into the probable causes of the failure. If the causes could be determined, and legal and reasonable remedial measures identified and implemented, consideration will be given to continuing to maintain the translocated population. If such reasonable measures cannot be identified and implemented, the results of the evaluation will be published in the **Federal Register** with a proposed rulemaking to terminate the experimental population.

Dated: August 5, 1987.

Susan Recce,

Acting Assistant Secretary for Fish and Wildlife and Parks.

[FR Doc. 87-18192 Filed 8-10-87; 8:45 am]

BILLING CODE 4310-55-M

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50 CFR Part 17

Record of Decision for Translocation of Southern Sea Otters To Establish an Experimental Population

AGENCY: U.S. Fish and Wildlife Service (Service), Interior.

ACTION: Notice of record of decision.

SUMMARY: This notice makes available to the public the Record of Decision (Record) on the proposal by the Fish and Wildlife Service to translocate a number of southern sea otters from the existing central California population for purposes of establishing and containing an experimental population. The Record was prepared in accordance with Council on Environmental Quality Regulations, 40 CFR 1505.2. The decision is based on information contained in: the Final Environmental Impact Statement (Impact Statement) and draft Final Rule, which were filed with the Environmental Protection Agency on May 1, 1987, and became available to the public on May 8, 1987; public comments received on the Final Impact Statement as well as on a scientific research permit application filed with the Federal Wildlife Permit Office; a biological opinion rendered by the Service, pursuant to section 7 of the Endangered Species Act, on the proposed translocation; legislative history and specific requirements of legislation, Public Law 99-625 (Pub. L.), enacted into law November 7, 1986, to authorize a translocation of California sea otters; a coastal zone consistency determination submitted to the California Coastal Commission on March 17, 1987; other pertinent scientific and technical data; and actions taken by the California Fish and Game Commission on an application for a State scientific research permit and California Coastal Commission on the Service's coastal zone consistency determination.

Alternative 1, the preferred alternative, has been selected as the best alternative for minimizing the effects of oil spills and for conducting scientific research on the relationship between southern sea otters and the marine ecosystem. It is also the environmentally preferred alternative. Alternative 1 involves translocation of up to 250 sea otters from their current central California range over a period of 5 years or longer to a translocation zone encircling San Nicolas Island, Ventura County, offshore of southern California for the purpose of establishing an experimental population. Mitigation of effects of translocated sea otters on fisheries and other marine resource uses includes the establishment of a management zone encompassing the waters of the remainder of southern California south of Point Conception that will be maintained free of otters by non-lethal capture and removal. The action is designed to carry out a major recovery and restoration objective for the sea otter in California, listed as "threatened" under the Endangered Species Act and considered "depleted" under the Marine Mammal Protection Act. The regulations for implementing Alternative 1 as a Final Rule to amend 50 CFR 17.84 appear elsewhere in today's **Federal Register.**

DATE: This Record of Decision is effective on August 5, 1987.

FOR FURTHER INFORMATION CONTACT: Mr. Wilbur Ladd, Office of Sea Otter Coordination, U.S. Fish and Wildlife Service, Room E–1818, 2800 Cottage Way, Sacramento, California 95825, (916) 978–4873.

SUPPLEMENTARY INFORMATION: The southern (or California) sea otter was listed in 1977 as "threatened" under the Endangered Species Act of 1973, as amended and, as such, is considered "depleted" under the Marine Mammal Protection Act of 1972, as amended. The primary factors contributing to its threatened status were the population's reduced size and range compared to historical levels, which were about 10 times larger than at present, and the vulnerability of sea otters to the effects of an oil spill such as might occur from a tanker accident. Since its 1977 listing, the status of the species has not improved while the risk of an oil spill along the central California coast has increased, primarily as a result of increasing volumes of oil being transported near the otters' range.

A recovery plan for the southern sea otter, approved in 1982, identifies establishment of at least one additional breeding colony as a principal objective that would be necessary in order to restore the California population to a non-threatened, recovered status. Furthermore, it is the primary goal of the Marine Mammal Protection Act that depleted marine mammals be restored to and maintained within their optimum sustainable population level, consistent with maintenance of the health and stability of the marine ecosystem. In 1980 the Marine Mammal Commission, which monitors implementation of the Marine Mammal Protection Act, advised the Service to proceed with the decisionmaking process necessary to establish a second colony of California sea otters, to conduct research necessary to understand the optimum sustainable population, and to consider a plan for zonal management of sea otters in which certain zones would be dedicated to sea otter protection and certain other zones would be designated as otter-free to minimize conflicts between sea otters and fisheries and other marine resource uses. In 1984, the Service published a report that identified four areas having the best potential for a successful translocation, based on a series of criteria. These included San Nicolas Island, California; the coast of northern California; the coast of southern Oregon; and the coast of northern Washington. This report served as the basis for further evaluation, investigation, and analysis by the Service in an Impact Statement.

In June 1984 the Service published a Notice of Intent to prepare an Impact Statement on establishment of an experimental population of southern sea otters, which initiated an intensive public involvement process.

During the public review of the Impact Statement and the rulemaking process the California Department of Fish and Game, interest groups and some private individuals expressed concern that existing authorities under the Marine Mammal Protection Act may be too restrictive to allow for long-term containment and management of an experimental population of sea otters. In order to address these and other concerns about the translocation, Congress solicited input from agencies and interest groups having an involvement in the issue. This Congressional interest ultimately resulted in the enactment of special legislation, Pub. L. 99–625, in November 1986 that authorizes and establishes procedures and requirements for a translocation of California sea otters. Public Law 99–625, which generally reflected a consensus approach as to how a translocation should be conducted, directs that a translocation plan be developed by rulemaking procedures and implemented in cooperation with the appropriate State agency.

The plan must contain the following:

(1) The number, age, and sex of sea otters proposed to be relocated.

(2) The manner in which sea otters will be captured, translocated, released, monitored, and protected.

(3) The specification of a zone (referred to as the "translocation zone") to which the experimental population will be relocated. The zone must have appropriate characteristics for furthering the conservation of the species.

(4) The specification of a zone (referred to as the "management zone") that—

(A) Surrounds the translocation zone; and

(B) Does not include the existing range of the parent population or adjacent range where expansion is necessary for the recovery of the species.

The purpose of the management zone is: (i) To facilitate the management of sea otters and containment of the experimental population within the translocation zone, and (ii) to prevent, to the maximum extent feasible, conflict with other fishery resources within the management zone by the experimental population. Any sea otter found within the management zone shall be treated as a member of the experimental population. The Service shall use all feasible non-lethal means and measures to capture any sea otter found within the management zone and return it to either the translocation zone or to the range of the parent population.

(5) Measures, including an adequate funding mechanism, to isolate and contain the experimental population.

(6) A description of the relationship of the implementation of the plan to the status of the species under the [Endangered Species] Act and to determinations of the Secretary [of the Interior] under section 7 of that Act.

The legislative history leading up to the enactment of the Pub. L. 99–625, in House Report 99–124 dated May 15, 1985, recognizes that establishment of a management (otter-free) zone that includes waters south of Point Conception would result in preventing the existing population from expanding its range to historic habitat south of Point Conception. The House Report acknowledged that setting the management zone boundary at Point Conception would allow for expansion beyond the sea otter's present range and would fully comply with the requirements of the legislation.

Alternatives Considered

The following alternatives were considered for accomplishing the purposes of minimizing the effects of an oil spill or similar event on the southern sea otter population and of conducting in-depth research on the population dynamics of sea otters and their relationship to and influence on the marine ecosystem:

1. Translocation to San Nicolas Island, Ventura County, California, and containment within a translocation zone that includes the intermediate nearshore waters of San Nicolas Island and a buffer area. This is identified in the Final Impact Statement as the preferred alternative in that it would meet the requirements for achieving the purposes for translocating otters while having the least environmental and socioeconomic impacts.

2. Translocation to a 185-mile segment of coast in northern California and containment within a translocation zone that includes the intermediate nearshore waters of the coast between Duncans Landing, Sonoma County, and False Cape Rock, Humboldt County, and a buffer area.

3. Translocation to a 70-mile segment of coast in southern Oregon and containment within a translocation zone that includes the intermediate nearshore waters between Cape Blanco and Brookings, Curry County, and a buffer area.

4. Translocation of sea otters in conjunction with additional management and range restriction of the existing population. This alternative involves translocation to and containment of otters at one of the sites described in the first three alternatives but, in addition, it would include a management zone between Point Sal (adjacent to the existing range) and Point Conception, California, which would be specifically managed to prevent expansion of the existing sea otter population into southern California.

5. Increased protection to the existing population, without a translocation, to reduce the threat of oil spills to the existing population. This alternative involves a variety of measures to reduce oil spill risks and effects to the present California sea otter population. Measures include establishment of mandatory-use tanker transport lanes at least 15 miles offshore, prohibition of future offshore oil and gas leasing and production within at least 15 miles of the existing sea otter range, prohibition of tankships from carrying petroleum products to or from major ports within the sea otter range, and procurement and maintenance of two seagoing tugs within the sea otter range to assist disabled tankers to avoid oil spills. Additional Federal legislation, agreements with the International Maritime Organization and promulgation of new regulations by U.S. Coast Guard would be required.

6. No action. This alternative assumes the status quo. The oil spill risks and effects to the present population would not be reduced. The species would continue to be protected as a threatened species under the Endangered Species Act and designated as depleted under the Marine Mammal Protection Act. Impacts on and conflicts with fisheries and other marine resource uses would increase above the present level as the existing population expands its range.

Basis for the Decision

A Draft Impact Statement was made available for public review and comment for 94 days, beginning August 15, 1986. During that period three public hearings were also conducted on the proposal. Based on comments received, a Final Impact Statement was completed and its availability announced in the **Federal Register** on May 8, 1987. Comments obtained from these public reviews were considered to the fullest extent possible leading to this Record of Decision.

Under Alternative 1, sea otters translocated to San Nicolas Island would be allowed to inhabit the available habitat adjacent to the 22-mile perimeter of the island. Within the translocation zone, which includes the sea otter habitat and a buffer area that extends 10–19 nautical miles seaward of the otter's habitat, otters would be given protections similar to those for the existing population. Within this translocation zone, predation by otters on shellfish resources is expected to result in the decline and eventual loss of the commercial and probably sport fisheries for abalone, sea urchins, and possibly spiny lobsters around the island. The commercial catch of these species represents 7–16 percent ($142,000–$354,000) of the total annual catch of these species in the Santa Barbara area (which includes ports in Ventura, Santa Barbara, and San Luis Obispo Counties). Prohibitions on incidental taking of sea otters in commercial fishing nets would be enforced within the translocation zone, thus a small proportion of the existing southern California gillnet fishery, representing about 2 percent or $28,000 annual income of the southern California gillnet landings, would be displaced by the presence of sea otters around San Nicolas Island.

A high quality sport fishery for lobster and abalone would be adversely affected and would probably eventually be lost. The fishery is estimated to represent up to 9 percent of the southern California sport dive boat income, or up to $281,000 net economic value per year.

Estimates of oil and gas resources within the translocation zone are low, with an estimated 1 percent chance of finding recoverable resources, thus the presence of otters (and associated potential restrictions placed on oil development under the Endangered Species Act or State law) would have a negligible impact on oil and gas development.

Predation of otters on dense populations of sea urchins (an algae feeder) in the translocation zone is predicted to result in a substantial increase in commercially available kelp (algae) supplies, an increse of possibly 50 percent or more.

An experimental abalone mariculture project would be precluded from achieving any significant commercial production due to otter predation on abalone; however, the technique for open-ocean abalone mariculture has not been well developed except in Japan where its success is attributed to intensive management and constant removal of all natural abalone predators, a type of management unlikely to ever be permitted on a publicly owned area such as the waters surrounding San Nicolas. Upon issuance of the mariculture lease, the California Fish and Game Commission advised the lessee that the lease would not prejudice future decisions on reintroductions of marine species.

The San Nicolas Island translocation zone meets all the criteria for a translocation site, it is the environmentally preferred alternative, and it has the least socioeconomic impact of the sites considered. The attributes of San Nicolas Island are: (1) It is within the historic range of the southern sea otter, (2) it contains excellent sea otter habitat and food resources, (3) it is relatively inaccessible to the general public (due to its 62-mile distance offshore and its being under U.S. Navy control), which enhances the Service's ability to protect the otters from vandalism and harassment, (4) it is a zone where research can be conducted under a nearly ideal before-and-after research design, (5) its isolated offshore island location increases the likelihood that otters would remain there and not disperse in large numbers, and (6) it is a zone where the risk of oil spills affecting the experimental population would be less than half the risk of such spills to the existing population and the chance that both the experimental and the existing sea otter population could be affected by the same oil spill is almost non-existent. The Service and the Navy have agreed in principle to conclude a Memorandum of Understanding to further the conservation of an experimental sea otter population at San Nicolas Island. This memorandum will cover such topics as access by the Service and notification of the Service prior to weapons testing.

Although small in size, the San Nicolas Island translocation zone is expected to meet the biological needs and recovery plan criterion for establishing a second population of sea otters. The minimum estimated carrying capacity is 280 sea otters. The minimum size colony and productivity needed for this colony to be considered "established" is 150 healthy otters and at least 20 young recruited annually into the new population for 3 out of 5 years with few otters dispersing from the zone. These criteria for an established population should be met relatively easily at San Nicolas and could conceivably be met within 5 or 6 years after translocation begins.

Although significant changes in the marine ecosystem are expected with reintroduction of otters to the San Nicolas translocation zone, the change would be toward a kelp forest ecosystem dominated by sea otters, similar to that which existed prior to

eradication of sea otters by commercial fur hunters in the 18th and 19th centuries. The existing level of commercial shellfish harvest around San Nicolas Island is not expected to continue once sea otters have reoccupied the habitat available around the island, estimated to take about 5 years.

Because the reintroduction of sea otters to waters surrounding San Nicolas island would have adverse impacts on fisheries in particular, the translocation plan developed for Alternative 1, as required by Pub. L. 99–625, would establish a management, or otter-free, zone from which any sea otter would be captured and removed using non-lethal means. The area encompassed by this zone includes all U.S. waters south of Point Conception, including those along the mainland as well as the offshore islands except the San Nicolas Island translocation zone. Maintenance of this management zone free of otters is the principal mitigation feature of the proposal for fisheries and other environmental and socioeconomic impacts. Implementation of this management zone would confine the impact of translocated sea otters on fisheries to the immediate vicinity around San Nicolas Island. In addition, it would prevent the existing population from expanding its range into major shellfish and gillnet fisheries of southern California south of Point Conception. Such range expansion is expected to occur within the next 10 to 20 years, and possibly sooner, in the absence of the management zone proposed in this translocation plan. If the existing population should expand into southern California unrestricted, its impact on commercial and sport fisheries would be many times greater than those projected to result from implementation of Alternative 1. The Alternative 1 plan would provide for additional range expansion both north and south of the present range, it would provide for establishment and protection of a second population of California sea otters for recovery and research purposes, and it would preclude significant conflicts between sea otters and fisheries and other marine resource uses throughout southern California coastal waters south of Point Conception, except within the San Nicolas Island translocation zone. The reintroduction of sea otters to the San Nicolas translocation zone would not eliminate any marine species from the nearshore waters, but it would reduce the densities and average size of the main sea otter prey species. Because of the high degree of protection afforded to the southern sea otter population as a whole from the effects of a major oil spill, and because of the lower adverse environmental and socioeconomic impacts that would result (compared to other alternatives), Alternative 1 is considered to be the environmentally preferable alternative.

Under Alternative 2, translocation of sea otters would result in otters occupying the available nearshore waters along about 185 miles of northern California coastline over a 47-year period. The otters would be protected within this translocation zone similar to the existing population. As with Alternative 1, predation by otters on shellfish within the translocation zone would result in the decline and eventual loss of the nearshore commercial fisheries for sea urchin and dungeness crab and the sport fishery for abalone. The commercial catch within the translocation zone represents about 2 percent of the total northern California catch for urchins and crabs. The sport abalone take from the translocation zone represents virtually 100 percent of the sport abalone fishery in northern California, estimated to be worth about $11,565,000 in annual net economic value, which, if lost, would result in an estimated additional annual loss to the regional economy of about $7,582,000. Oil and gas resources within the northern California translocation zone are believed to be substantial, valued at about $2.5–5.0 billion, with a 57 percent chance of finding recoverable resources. Therefore, the effect on future offshore oil and gas development could be substantial depending on restrictions imposed under the Endangered Species Act or State law as a result of the otters' presence. Sea otter predation on sea urchins could result in an increase in kelp, but at present there is no commercial kelp harvest in northern California so the potential increase in kelp may not have any social or economic benefit. There is no known shellfish mariculture operation that would be affected in northern California.

Northern California contains excellent sea otter habitat and meets the criteria for being suitable as a potential translocation site. However, the length of the zone and its ease of public access would make protection of the colony and research on population dynamics and sea otter influence on the marine ecosystem more difficult than at the San Nicolas site. Containment of otters within the translocation zone would be expected to be more difficult than at an island site, and maintenance of the otter-free management zone (which includes the coast between Duncans Landing and San Francisco Bay on the south and between Eureka and the Oregon border on the north) would not prevent the existing sea otter population from expanding into important fishery areas in southern California. The carrying capacity of the translocation zone is larger than San Nicolas and is estimated to be 1,120–1,200 sea otters, thus it could readily meet the purposes for establishing a second colony.

The Alternative 2 plan would, similar to Alternative 1, provide for additional range expansion both north and south of the present range, it would provide for establishment and protection of a viable second population of California sea otters, and it would preclude conflicts between sea otters and fisheries and other marine resource uses within the surrounding management zone. However, since few significant fisheries exist in the northern California management (no-otter) zone and since it would not prevent the existing sea otter population from expanding into important fishery areas of southern California, the ability to provide mitigation by use of the management zone may not be fully realized.

Translocation to the southern Oregon coast, under Alternative 3, would result in otters occupying available nearshore habitat along a 70-mile stretch of coastline over a 29-year period. They would be protected within the translocation zone similar to the existing California population. As with Alternatives 1 and 2, predation by otters on shellfish within the translocation zone would result in the decline and eventual loss of the nearshore commercial fishery for dungeness crab and sport razor clam fishery. The commercial catch of crabs within the translocation zone represents about 27 percent of the total Oregon crab landings, with an average net annual value of nearly $1.6 million. A maximum of 5 percent of the sport razor clamming trips occur within the translocation zone, estimated to have a value of $153,000 per year. With the loss of this fishery, the regional economy would annually lose an additional $100,000 of fishermen's expenditures. Oil and gas resources within the zone are believed to be very limited, with a 7 percent chance of finding recoverable reserves. Thus little or no impact on oil and gas development would be expected as a result of the otters' presence. There are no known commercial mariculture or kelp operations in the southern Oregon translocation zone. As with Alternatives 1 and 2, southern Oregon would meet the criteria for being suitable as a

potential translocation site. Like Alternative 2, the length of the zone and ease of public access would make protection of the colony and research on population dynamics and influence on the marine ecosystem more difficult than at the San Nicolas site. Containment of otters within the translocation zone is expected to be more difficult than at an island site. Maintenance of the otter-free management zone (which includes the coast between False Cape and Crescent City, California, on the south, and near Cape Blanco to Yaquina Head, Oregon, on the north) would not prevent the existing sea otter population from expanding into important fishery areas in either southern or northern California. The carrying capacity of the translocation zone is estimated at 720–1,200 sea otters, thus this alternative could meet the purposes for establishing a second colony. The Alternative 3 plan, similar to Alternatives 1 and 2, would provide for additional range expansion both north and south of the present range, it would provide for establishment and protection of a viable second population of California sea otters, and it would preclude conflicts between sea otters and fisheries and other marine resource uses within the surrounding management zone. However, since few significant fisheries exist in the southern Oregon management zone and since it would not prevent the existing California population from expanding into important fishery areas of southern and northern California, the ability to provide mitigation by use of the management zone may not be fully realized.

Alternative 4 would produce results and impacts similar to Alternatives 1, 2, or 3, depending on the site chosen for translocation; however, Alternative 4 would produce the additional consequence of restricting the numbers of sea otters that may eventually be allowed to reoccupy the section of historic habitat located between Point Sal (5 miles south of the existing range) and Point Conception. Management of sea otters in this manner would require legislative changes regardless of which of the three sites were selected for translocation. The general results of Alternatives 1 and 4 would be nearly the same if San Nicolas Island was chosen as the translocation site. However, if northern California or southern Oregon were chosen under Alternative 4, it would result in restriction of southward expansion of the present range in addition to establishment of a translocation and management zone, and their associated costs and environmental consequences, at the northern California or Oregon site.

Alternative 5 would take an entirely different approach to reducing the threat and impacts of oil spills to sea otters. It would place major restrictions on future oil development and transportation within the existing sea otter range as well as require two seagoing tug boats to be stationed in the range to assist disabled tankers. No sea otter translocation would be undertaken, and no management or containment of the existing sea otter population would occur. While the direct impacts of a translocation on fisheries would be avoided initially, there would be no restriction in the expected growth and range expansion (assuming that this alternative actually results in a reduced risk of oil spills) of the existing population, thus, eventually sea otters would reoccupy major fishery areas in southern California. Under these circumstances, fishery impacts would be far greater than under the preferred alternative. Furthermore, although placing restrictions on oil development and transportation could reduce overall risks of oil spills to sea otters and other coastal and marine resources, securing the restrictions would be a lengthy process. It would involve, among other things, new Federal legislation and subsequent rulemaking to establish mandatory requirements for vessel operators, approvals by the International Maritime Organization and Congressional appropriations for procurement and operation of seagoing tugs. The lengthy process to implement this alternative and the uncertainty of ever being able to implement certain components would delay the protections for sea otters and, thus, the existing population would remain vulnerable to the possibility of decimation due to a catastrophic oil spill. The immediate and long-term costs of Alternative 5 would be considerably greater than any of the other alternatives, including the preferred alternative.

Alternative 6 would maintain the status quo. There would be no translocation and assocated environmental and socioeconomic impacts, no immediate protection of the sea otter population from oil spills, and no aggressive effort to recover the population except as might occur through Endangered Species Act section 7 consultations and State and Federal actions to curb incidental entanglement of otters in fishing nets and intentional illegal killings. The southern sea otter would continue to be protected as a threatened species, and may even be considered for endangered status if oil spill or other threats increase above current levels or the population status deteriorates. Immediate adverse environmental impacts on fisheries would be avoided; however, unlike with the preferred alternative, the existing population would be expected to grow and expand its range without restriction (if no major perturbation, such as an oil spill, were to decimate the population). In the long run, this would likely result in greater impacts to fisheries, oil development, and other marine uses as the range expands.

If translocation to establish at least one additional colony was precluded indefinitely, the recovery plan for the southern sea otter would require revision to incorporate new strategies to promote recovery under the Endangered Species Act. Selection of either Alternative 5 or 6 would preclude the opportunity for effectively answering most of the research questions to be addressed under the preferred alternative. This research would help scientists to better understand the relationship of sea otters to the marine ecosystem and, thus, aid in restoring the California sea otter to an optimum sustainable population, a goal of the Marine Mammal Protection Act.

Biological Opinion

On March 6, 1987, the Service's Regional Director signed a biological opinion, issued pursuant to section 7 of the Endangered Species Act, on the effects of the proposed translocation of the southern sea otter. The opinion is included in the Final Impact Statement as Appendix I. The biological opinion concluded the following:

> The proposed translocation of southern sea otters to San Nicolas Island, California, is a well designed recovery action that is expected to result in the establishment of a new colony of otters at San Nicolas Island. The plan provides for careful monitoring and evaluations of the project to maximize the opportunity for success while minimizing negative impacts on the parent population. Therefore, it is our biological opinion that the proposed translocation of southern sea otters to San Nicolas Island is not likely to jeopardize the continued existence of the species.

The opinion also includes 18 non-mandatory conservation recommendations which, if implemented, may further minimize impacts of translocation on sea otters and generally improve chances for the species' recovery. The Service intends to implement the 18 conservation recommendations to the maximum extent feasible. Details were provided in

a letter to the California Coastal Commission dated May 18, 1987.

Coastal Zone Consistency Determination

In compliance with Federal regulations and the Coastal Zone Management Act which require that any Federal project that will directly affect the coastal zone must be undertaken in a manner consistent, to the maximum extent practicable, with the State's approved coastal zone management program, the Service submitted a consistency determination to the California Coastal Commission (Coastal Commission) on March 17, 1987, for review and concurrence. The determination (included in the Final Impact Statement as Appendix J) concluded that the proposed translocation would be, to the maximum extent practicable, consistent with the California Coastal Zone Management Program. The Coastal Commission staff expressed concern about two aspects of the translocation in particular: (1) Impacts on fisheries, and (2) the Service's ability (financial and physical) to carry out the principal mitigation feature of maintaining an otter/free management zone on a continuing basis. The staff concluded that the protections afforded fisheries by the management zone throughout the remainder of southern California, except in the San Nicolas translocation zone, would offset the direct fisheries impacts around San Nicolas but only if the Service is fully successful in keeping the management zone otter-free. In order to keep the Coastal Commission informed regarding the results of the containment effort, the Service agreed to provide an annual status report to the Coastal Commission as well as other agencies.

The Coastal Commission held a public hearing on the Service's consistency determination on July 7, 1987. Prior to the hearing, Coastal Commission staff prepared a comprehensive report and recommendation on the proposal. The staff recommended that the Coastal Commission concur with the Service's determination that the project is consistent and would be conducted in a manner consistent, to the maximum extent practicable, with the California Coastal Management Program.

At the conclusion of the July 7 public hearing, the Coastal Commission voted to concur with the Service's determination of consistency.

California Fish and Game Commission

Public Law 99–625 provides that the translocation must be administered by the Service in cooperation with the appropriate State agency. California has enacted legislation that forbids the taking of sea otters in the absence of a scientific research permit. In the 43 CFR 24.4(i)(5)(i), the national fish and wildlife policy states:

> Federal agencies of the Department of the Interior shall . . . [c]onsult with the States and comply with State permit requirements in connection with the activities listed below, except in instances where the Secretary of the Interior determines that such compliance would prevent him from carrying out his statutory responsibilities: In carrying out research programs involving the taking or possession of fish and wildlife or programs involving reintroduction of fish and wildlife. . . .

Accordingly, the Service applied to the California Fish and Game Commission for a State scientific research permit on May 15, 1987, to conduct the translocation. The Service has worked very closely with the California Department of Fish and Game (Department) to develop a mutually acceptable translocation plan that would promote recovery of the southern sea otter while minimizing impacts on the State's fisheries, particularly those in southern California. The Department had reviewed and commented on a number of drafts of the translocation plan, proposed regulations, and impact statements over the nearly 3-year decisionmaking process. On May 21, 1987, the Department recommended to the Fish and Game Commission that the Service be issued a State research permit to conduct the translocation. Consistent with the Department's recommendation, a Federal research permit is being issued to the Department to carry out research on the existing California sea otter population designed to evaluate the effectiveness of several non-lethal containment methods. Specifically this permit authorizes research in three phases. The first phase would result in the take of 20 sea otters from the southern end of their range and extralimital areas south of their current range. These otters would then be released in the northern portion of their current range. This phase will study factors influencing the return of otters to their point of capture. The second phase would involve the capture and removal of all sea otters entering an experimentally established no-otter zone during a 3-year period. The third phase would involve non-lethal reduction in density in the experimental area to determine factors influencing movement and range expansion. This phase would not commence until a fully developed research proposal, based on the results of the first two phases, has been submitted along with a permit renewal or amendment request, at which time comments will be sought from the Marine Mammal Commission and Section 7 consultation will be reinitiated. Also, the Service and the Department have agreed in principle to a Memorandum of Understanding that sets forth the terms and conditions under which the translocation would proceed and the respective roles and responsibilities of the two agencies.

The Fish and Game Commission held a hearing on June 24, 1987, on the proposed translocation permit. However, due to a procedural error under State law regarding notice that they intended to utilize the Federal Impact Statement in making their decision, the Fish and Game Commission did not make a determination on the permit. Instead the Fish and Game Commission has scheduled another hearing for August 7, 1987, and a vote on the permit on August 18, 1987. No otters will be captured for translocation purposes until after August 18, 1987.

Restricted Timeframe for Implementation

The period between the middle of August and the middle of October is the only time during the year that acceptable weather conditions in the capture and release areas can be expected. Fog or storms are prevalent at most other times. Due to the number of otters of specific ages and sexes that must be captured and translocated, the operation will probably require 6–8 weeks to carry out and it must be done when weather and sea conditions are compatible. Thus, the narrow window of time between mid-August and mid-October is the only time that it would be safe to conduct the translocation. If the field work could not be started in August, the project would have to be delayed nearly a full year until next August, with the result that California sea otters would continue to be concentrated in their existing range, where they are vulnerable to oil spills and other catastrophic environmental perturbations, for another year.

Policy Considerations

The Service's extensive analysis of data in its Draft and Final Impact Statements, proposed rulemaking, and public comments thereon; a nearly 3-year study of potential translocation sites and related conflicts prior to initiating a formal decisionmaking process; specific direction from the U.S. Congress; a biological opinion on the effects of the proposal; and the Service's 3-year public involvement process have, collectively, provided a sound basis for

making a decision on the proposed translocation. Alternative 1, the preferred alternative, would, in the view of the Service, clearly promote the recovery of the southern sea otter, meet the spirit and letter of Pub. L. 99-625, and minimize impacts on the environment and other marine resource uses. The Service's preferred alternative incorporates a major mitigation feature that is specifically authorized and required by Federal legislation—the establishment and maintenance of an otter-free management zone. The management zone is economically important to the fishery interests in the region. Implementation of the translocation plan will culminate in a "zonal management" plan to address sea otter-fisheries conflicts in southern California. This has been long sought by the Department and fisheries interests, recommended to the Service by the Marine Mammal Commission, mandated by Congress, and agreed to by environmental groups and other interests. The Department supports the plan and the Coastal Commission agrees that it is consistent, to the maximum extent practicable, with the State's Coastal Zone Management Program. I concur in the judgments of the Service and in the cooperative approach to resolving the longstanding issue of sea otter translocation in California. All practicable means to avoid or minimize environmental or socioeconomic harm have been incorporated into the translocation plan and implementing regulations, which will be published separately in the **Federal Register.**

Conclusion

Based on a careful review and consideration of Pub. L. 99–625, the Environmental Impact Statement, proposed rulemaking prepared by the Service and public comments received thereon, consideration by the California Coastal Commission and Fish and Game Commission, and other relevant factors reflected in the Administrative Record, I select Alternative 1 as the best alternative to achieve the stated purposes of minimizing the effects of oil spills on this threatened population, studying the relationship of sea otters to the marine ecosystem, and implementing Pub. L. 99–625.

Dated: August 5, 1987.

Susan Recce,

Assistant Secretary for Fish and Wildlife and Parks.

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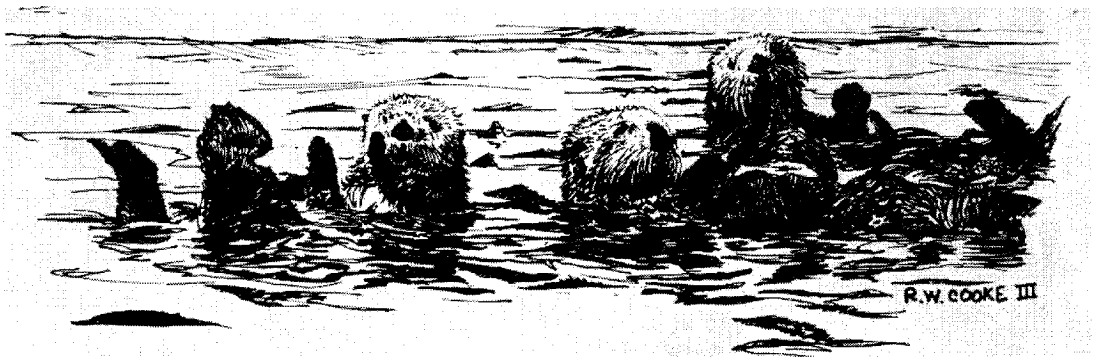
Appendix E: Scoping Report, Supplemental Environmental Impact Statement on the Translocation of Southern Sea Otters

SCOPING REPORT

Supplemental
Environmental Impact Statement

Translocation of Southern Sea Otters



Prepared by

United States Fish and Wildlife Service

April 2001

Background

On January 14, 1977 (42 FR 2968) we, the U.S. Fish and Wildlife Service, listed the southern sea otter (Enhydra lutris nereis) as a threatened species under the Endangered Species Act (ESA) on the basis of its small population size, greatly reduced range, and the potential risk from oil spills. We established a recovery team for the species in 1980 and approved a recovery plan on February 3, 1982. In the recovery plan, we identified the translocation of southern sea otters to a remote location in order to establish a second colony of otters as an effective and reasonable recovery action, although we acknowledged that a translocated southern sea otter population could impact shellfish fisheries that had developed in areas formerly occupied by southern sea otters. Goals cited in the recovery plan included: minimizing risk from potential oil spills; establishing at least one additional breeding colony outside the then-current southern sea otter range; and compiling and evaluating information on historical distribution and abundance, available but unoccupied habitat, and potential fishery conflicts.

The purpose of the translocation program was to establish southern sea otters in one or more areas outside the otters' then-current range to minimize the possibility of a single natural or human-caused catastrophe, such as an oil spill, adversely affecting a significant portion of the population. Ultimately, it was anticipated that translocation would result in a larger population size and a more continuous distribution of animals throughout the southern sea otter's former historical range. We viewed translocation as important to achieve recovery and to identify the optimum sustainable population (OSP) level for the southern sea otter as required under the Marine Mammal Protection Act (MMPA).

Translocation of a listed species to establish experimental populations is specifically authorized under section 10(j) of the ESA. However, the southern sea otter is protected under both the ESA and the MMPA, and the MMPA contains no similar translocation provisions. For southern sea otters, this dilemma was resolved by the passage of Public Law (P.L.) 99-625 (Fish and Wildlife Programs: Improvement; Section 1. Translocation of California Sea Otters) on November 7, 1986, which specifically authorized development of a translocation plan for southern sea otters administered in cooperation with the affected State.

If the Secretary of the Interior chose to develop a translocation plan under P.L. 99-625, the plan was to include: the number, age, and sex of sea otters proposed to be relocated; the manner in which sea otters were to be captured, translocated, released, monitored, and protected; specification of a zone into which the experimental population would be introduced (translocation zone); specification of a zone surrounding the translocation zone that did not include range of the parent population or adjacent range necessary for the recovery of the species (management zone); measures, including an adequate funding mechanism, to isolate and contain the experimental population; and a description of the relationship of the implementation of the plan to the status of the species under the ESA and determinations under section 7 of the ESA.

The purposes of the management zone were to facilitate the management of southern sea otters and containment of the experimental population within the translocation zone and to prevent, to the maximum extent feasible, conflicts between the experimental population and fishery resources within the management zone. Any sea otter found within the management zone was to be treated as a member of the experimental population. The Service was required to use all feasible non-lethal means to capture sea otters in the management zone and return them to the translocation zone or to the range of the parent population.

In May 1987, we finalized an EIS which analyzed the impacts of establishing a program to translocate southern sea otters from their then-current range along the central coast of California to areas of northern California, southern Oregon, or San Nicolas Island off the coast of southern California. San Nicolas Island was identified as our preferred alternative. A detailed translocation plan meeting the requirements of P.L. 99-625 was included as an appendix to the final EIS.

We implemented the translocation plan and began moving groups of southern sea otters from the coast of central California to San Nicolas Island starting on August 24, 1987. In December 1987, in coordination with the CDFG, we began capturing and moving sea otters that entered the designated management zone in an effort to minimize conflicts between sea otters and fisheries within the management zone and to facilitate the management of sea otters at San Nicolas Island.

We released 140 southern sea otters at San Nicolas Island between August 1987 and March 1990. As of March 1991, approximately 14 sea otters (10 percent) were thought to remain at the island. Some sea otters died as a result of translocation; many swam back to the parent population, some moved into the management zone; and the fate of more than half the sea otters taken to San Nicolas is unknown. In 1991, we stopped translocating sea otters to San Nicolas Island, due to low retention and survival. However, we continued monitoring the sea otters remaining in the translocation zone. Sea otter surveys at San Nicolas Island are now conducted by the Biological Resources Division of the U.S. Geological Survey on a bimonthly basis.

Sea otters were captured and removed from the management zone until February 1993. At that time, two sea otters that had been recently captured in the management zone were found dead shortly after their release in the range of the parent population. A total of four sea otters were known or suspected to have died within 2 weeks of being moved from the management zone. We suspended all sea otter capture activities in the management zone to evaluate sea otter capture and transport methods. Results of the evaluation were inconclusive, but we remained concerned that capture and transport of sea otters found in the management zone could result in the death of some animals. Between December 1987 and February 1993, 24 sea otters were captured and removed from the management zone and returned to the parent range. Of these, 2 sea otters were captured twice in the management zone after being moved to the northern end of the parent range, suggesting that capture and relocation were ineffective. We discontinued

containment efforts after 1993 in response, in part, to our concerns about the unexpected mortalities of otters experienced shortly following their removal from the management zone. We also recognized that techniques at the time, which proved to be less effective than originally predicted and were labor intensive, were not a feasible means of containing otters. From 1993 to 1997, few sea otters were reported in the management zone and there appeared to be no immediate need to address sea otter containment. In 1997, CDFG announced that they also would no longer be able to assist with sea otter captures in the management zone.

A group of approximately 100 southern sea otters moved from the parent range into the northern end of the management zone in 1998. At the same time, range-wide counts of the southern sea otter population indicated a decline of approximately 10 percent since 1995. Given the decline in the southern sea otter population, we asked the Southern Sea Otter Recovery Team, a team of biologists with special expertise in sea otter ecology, for a recommendation regarding the capture and removal of sea otters in the management zone. The recovery team recommended that we not move sea otters from the management zone to the parent population because moving large groups of sea otters and releasing them within the parent range would be disruptive to the social structure of the parent population.

In August 1998, we held two public meetings to provide information on the status of the translocation program, identify actions we intended to initiate, and solicit general comments and recommendations. At these meetings, we announced that we would reinitiate consultation under section 7 of the ESA for the containment program and begin the process of evaluating failure criteria established for the translocation plan. The technical consultant group for the Southern Sea Otter Recovery Team, composed of representatives from the fishery and environmental communities as well as State and federal agencies, was also expanded to assist with evaluating the translocation program. We provided updates on the translocation program and status of the southern sea otter population to the California Coastal Commission, Marine Mammal Commission (MMC), and California Fish and Game Commission in 1998 and 1999.

In March 1999, we distributed our draft evaluation of the translocation program to interested parties. The draft document included the recommendation that we declare the translocation program a failure because fewer than 25 sea otters remained in the translocation zone and reasons for the translocated otters' emigration or mortality could not be identified and/or remedied. We received substantive comments from agencies and the public following release of the draft for review. Comments included both support and lack of support for declaring the translocation program a failure. The majority of respondents cited new information that became available after publication of the EIS for the program. Many respondents encouraged us to look at alternatives not identified in the EIS or corresponding implementing regulations.

We prepared a draft biological opinion evaluating southern sea otter containment and distributed it to interested parties for comment on March 19, 1999. We completed a final opinion on July 19, 2000. Our reinitiation of consultation was prompted by the receipt of substantial new

information on the population status, behavior, and ecology of the southern sea otter that revealed effects of containment that were not previously considered. Specifically, the biological opinion noted that in 1998 and 1999 southern sea otters moved into the management zone in much greater numbers than had occurred in prior years; analysis of carcasses indicated that southern sea otters were being exposed to environmental contaminants and diseases which could be affecting the health of the population throughout California; range-wide counts of southern sea otters found numbers were declining; recent information, in particular the implications of the effects of the Exxon Valdez oil spill, indicated that sea otters at San Nicolas Island would not be isolated from the potential effects of a single large oil spill; and the capture and release of large groups of sea otters was likely to result in substantial adverse effects on the parent population. The Service concluded that reversal of the southern sea otter population decline and expansion of the southern sea otter's population distribution are essential to its survival and recovery. The Service further concluded that continuation of the containment program, while restricting the southern sea otter to the area north of Point Conception, will likely exacerbate recent sea otter population declines and increase vulnerability to a catastrophic oil spill or other man-made or natural stochastic events, and, therefore, likely jeopardize the continued existence of the species.

On February 8, 2000, a draft revised recovery plan for the southern sea otter was released for public review and comment (65 FR 6221). Based on the observed decline in abundance and shift in distribution of the southern sea otter population, the recovery team recommended in the draft revised recovery plan that it would be in the best interest of the southern sea otter to declare the experimental translocation of southern sea otters to San Nicolas Island a failure and discontinue maintenance of the management zone. The recovery team's recommendation will be fully evaluated through our ongoing NEPA process on the translocation action.

On January 22, 2001, we issued a policy statement regarding capture and removal of southern sea otters in the designated management zone (66 FR 6649). The notice advised the public that we would not capture and remove southern sea otters from the management zone pending completion of our reevaluation of the southern sea otter translocation program including the preparation of a supplemental environmental impact statement (EIS) and release of a final evaluation of the translocation program, including analysis of failure criteria. Based on our July 2000 biological opinion, we determined that containment of sea otters was not consistent with our requirement under the Endangered Species Act to avoid jeopardy to the species.

Purpose and Need for Action

Purpose for Action

The purpose of this supplemental EIS is to reevaluate the southern sea otter translocation plan as described in the final EIS for Translocation of Southern Sea Otters, Appendix B, May 1987, and

consider modifications to the southern sea otter translocation program, as presently structured, including termination of the program. The supplemental EIS will update information, assess the impacts of proposed alternatives, provide for public participation, and ultimately identify alternatives which will reduce the southern sea otter's vulnerability to extinction.

Need for the Action

The need for the action relates to the low success rate associated with the original sea otter translocation program. A original purpose of the translocation program was to establish a colony of sea otters at a location outside the then existing parent range to enhance recovery of the species. Contrary to expectations and to the primary recovery objective of the program, translocation of sea otters to San Nicolas Island has not produced a second, independent colony of sea otters sufficiently removed from the parent population so as to be shielded against the possibility of a natural or human-caused event, such as an oil spill.

Since the completion of an EIS for the translocation of southern sea otters in 1987, changed circumstances and new information have come to light. The translocation of sea otters to San Nicolas Island has been much less successful than expected; large groups of sea otters are periodically moving into the designated management zone; capturing and moving sea otters out of the management zone has proven to be more difficult than anticipated; we have determined that containment of sea otters will likely jeopardize the species continued existence; and the southern sea otter recovery team recommends against additional translocations of sea otters and calls for a fundamentally different strategy for recovery of the species.

Scope of the Supplemental Environmental Impact Statement (EIS)

The final EIS for Translocation of Southern Sea Otters, May 1987, identified and considered issues and alternatives for potential southern sea otter translocation sites in southern Oregon, northern California, and San Nicolas Island. A translocation plan for moving southern sea otters to San Nicolas Island was identified as the preferred alternative and was selected for implementation in August 1987 (52 FR 29784).

The scope of the supplemental EIS will be limited to issues and alternatives relating to the translocation of southern sea otters to San Nicolas Island and associated translocation plan including sea otter containment. The area of consideration will include all United States waters and islands seaward of the mean high tide line and south of Point Conception, California (34° 26.9' N). Effects of proposed actions on the southern sea otter population in central California will also be evaluated.

Decision-Making

The supplemental EIS is being prepared to satisfy the requirements of the National Environmental Policy Act (NEPA). The supplemental EIS will contain an analysis of alternatives and will outline information to be used by decision-makers in selecting an alternative. The environmental review of this project will be conducted in accordance with the requirements of NEPA, 42 U.S.C. 4321, *et seq.*, Council for Environmental Quality Regulations for Implementing NEPA, 40 CFR 1500, *et seq.*, other appropriate federal and state regulations, and Service policy for compliance with those regulations. After completion of the supplemental EIS, the Service will select an alternative for implementation and publish a Record of Decision based upon the findings of the document.

Public Involvement

On July 27, 2000, we published in the Federal Register a notice of intent to prepare a supplemental EIS on the southern sea otter translocation program (65 FR 46172). The Federal Register notice announced that public scoping meetings would be held on August 15, 2000 in Santa Barbara, California and August 17, 2000 in Monterey, California. On July 27, 2000, we distributed a press release that identified the scoping meeting dates, times and locations, to wire services at Associated Press (San Francisco) and Bay City News, reporters in coastal counties of California, local radio and television stations, and other interested parties. Formal notices of the meetings were posted in the Santa Barbara News Press, The Independent (Santa Barbara), The Coast Weekly (Monterey) and the Monterey Herald.

The purpose of the scoping meetings was to solicit information to be used to define the overall scope of the supplemental EIS, identify significant issues to be addressed, and identify alternatives to be considered. A brief presentation on the NEPA process and information related to the southern sea otter translocation plan was provided at each session with the balance of the time remaining made available for public statements. Verbal comments and suggestions were compiled on flip charts. We also solicited written comments and requested that these be sent to us, through electronic or regular mail, by September 30, 2000. A total of 61 individuals attended scoping sessions held in Santa Barbara and 43 individuals attended scoping sessions in Monterey.

We met with the technical consultants to the Southern Sea Otter Recovery Team to discuss scoping of the supplemental EIS on September 26, 2000. Comments received during the scoping meetings were reviewed and additional information was solicited from the group.

Characterization and Summary of Issues and Concerns Raised During Scoping Meetings

A summary of comments received at the scoping meetings is provided in Appendix 1. Copies of all written comments received during the scoping period may be found in Appendix 2.

Generally, issues and concerns fell into four primary categories: (1) Economic impacts to fisheries and tourism; (2) Impacts to the nearshore marine ecosystem; (3) Impacts to the southern sea otter population; and (4) Impacts to other agency activities. All of these areas will be evaluated further in the supplemental EIS.

Worldwide temperature change, water quality, oil spill risk and mitigation measures, and impacts to wetlands were also identified during scoping. Although we agree these are important areas of concern we will not consider them further in the supplemental EIS because they are beyond the scope of the document and/or our ability to effect change in these areas with our proposed alternatives.

Alternatives to be Considered in Supplemental EIS

In our notice of intent to prepare a supplemental EIS we identified five possible alternatives to be considered in the document. Many participants in the scoping process identified their support one alternative or some combination of these alternatives. Based on comments received we have modified our list of alternatives. The following alternatives will be evaluated in the supplemental EIS:

Alternative 1: Continue the Southern Sea Otter Translocation Program (No Action Alternative)

This alternative would continue the southern translocation program, as defined in Public Law 99-625 and 50 CFR §17.84(d), including removal of sea otters from the management zone if changed circumstances or new information indicate that containment would not result in jeopardy to the species.

Alternative 2: Continue the Southern Sea Otter Translocation Program With Modification

This alternative would require a rulemaking to change the existing regulations at 50 CFR 17.84(d)(4). The boundaries of the management zone would be re-delineated. Containment of sea otters would resume within the new boundaries of the management zone if this action would not result in jeopardy to the species. We would also pursue a change in State regulations to modify lobster, crab, and live fin-fish trapping at San Nicolas Island to avoid any reasonable possibility of take of sea otters in traps.

Alternative 3: Declare the Southern Sea Otter Translocation Program a Failure

The following sub-alternatives would require completion of an evaluation of the translocation program, including established failure criteria [50 CFR § 17.84(d)(8)], followed by consultation with the California Department of Fish and Game and the Marine Mammal Commission.

Alternative 3a: ***Remove Sea Otters from San Nicolas Island and from the Management Zone***

Per 50 CFR §17.84(d)(8)(vi), the rulemaking for the translocation program would be amended to terminate the experimental population, and all otters remaining within the translocation zone would be captured and placed back in the range of the parent population. Efforts to maintain the management zone free of otters would be curtailed after all reasonable efforts were made to remove otters in the management zone at the time of the decision to terminate the program, provided that this action will not jeopardize the species.

Alternative 3b: ***Remove Sea Otters from San Nicolas Island and Allow Sea Otters to Remain in Management Zone***

The rulemaking for the translocation program would be amended to terminate the experimental population, and all otters remaining within the translocation zone would be captured and placed back in the range of the parent population, provided that this action will not jeopardize the species. Efforts to maintain the management zone free of otters would stop immediately upon final decision.

Alternative 3c: ***Allow Sea Otters to Remain at San Nicolas Island and Allow Sea Otters to Remain in Management Zone***

The rulemaking for the translocation program would be amended to terminate the experimental population. All sea otters within the translocation zone and management zone would be allowed to remain. Efforts to maintain the management zone free of otters would be would stop immediately upon final decision.

Alternatives Identified but Not Considered in Supplemental EIS

The following alternatives were proposed during the scoping period but will not be considered further in the supplemental EIS. See previous sections on the purpose and scope of the supplemental EIS for additional information concerning criteria used for these determinations.

- *Place a Moratorium on Shellfisheries.* This alternative is beyond the scope of supplemental EIS and beyond our ability to effect change consistent with the purpose and need of the supplemental EIS. Shellfisheries in California are managed by the California Department of Fish and Game.

- *Establish No-Take Zones for Fisheries.* We recognize that there are efforts underway to establish no-take zones where fisheries will be reduced or eliminated. The proposed zones will be considered in our effect analysis however we do not intend to propose new no-take zones for fisheries. This would not be consistent with the purpose of the supplemental EIS and is beyond our ability to effect change.

- *Develop Educational Programs to Encourage People to Use Alternative Food Sources and Reduce Seafood Consumption.* This alternative is beyond the scope of the supplemental EIS and does not meet the purpose and need for action.

- *Petition the U.S. Navy to Include San Nicolas Island Within the Channel Islands National Park.* We believe that the intent of this proposed alternative is to provide additional protection to the translocated population of southern sea otters. Under the translocation plan, sea otters within the boundaries of the Channel Islands National Park receive no additional protection when compared to those found in the translocation zone at San Nicolas Island. This alternative would not result in a significant modification to the translocation program and is essentially equivalent to our no-action alternative (Alternative 1).

- *Establish a Captive Breeding Program and Reintroduce Sea Otters to Other Sites in California and Mexico.* We are not considering reintroduction of sea otters to other sites in California and Mexico. This alternative is beyond the scope of the supplemental EIS and does not meet the purpose and need for action.

- *Move Sea Otters North or Translocate Sea Otters to a Location Closer to the Parent Population.* We are not considering alternate translocation sites. The scope of the supplemental EIS is limited to the translocation of southern sea otters to San Nicolas Island and associated translocation plan.

Supplemental EIS Schedule

We expect to publish and distribute a draft supplemental EIS in the Fall of 2001. Public hearings will be held and written comments on the draft document will be accepted following publication. We expect a final supplemental EIS to be published about a year after publication of the draft. A final decision concerning the southern sea otter translocation program is expected shortly after the release of the final supplemental EIS.

Appendix 1

Comments Received During Scoping Meetings
August 15 and 17, 2000

Suggested Issues to be Addressed

Received at Scoping Meetings, August 15 and 17, 2000

- Impact to shellfisheries
- Worldwide temperature Changes
- Cost of recovery of sea otters
- Reflect an ecosystem approach
- Mitigation for species impacts in southern California
- Identification of critical habitat for sea otters
- Genetic consequences of isolating populations
- Long term management of sea otters beyond protections offered under the Endangered Species Act
- Dietary preferences of sea otters
- Sea otter recovery, population numbers
- Use of artificial refuges to prevent sea otter predation and allow for fisheries
- Impacts to depleted abalone species; white, black, pink, green
- Pollution
- Consider food supply for otters
- Patrols to protect otters in remote areas
- Management zone threat to recovery of sea otters
- Restoration of kelp beds
- Sea otter tourism and co-existence
- Oil tanker traffic in coastal areas, double hulled vessels
- Impacts to management efforts at Channel Islands National Marine Sanctuary
- Consider humaneness of each alternative
- Translocation risk to sea otters
- Impact to recovery of sea otters
- Indirect effects to marine resources
- Mitigation measures to reduce economic impacts
- Impacts to the endangered white abalone
- Sea otter as a keystone species
- Impact to kelp industry
- Impact to wetlands
- Existing impact to sea otters in the parent population; Diablo canyon, municipal sewage, feral cats
- Impact to sea urchins
- Oil spill risk
- Predation on sea otters
- Northward expansion of the sea otter population
- Peer review
- Open access to all data
- Impact of El Nino
- Channel Islands Marine Sanctuary expansion
- Welfare of individual sea otters
- Water quality
- Monitoring contaminants in sea otters
- Construction of wildlife care facilities in Santa Barbara County

Suggested Alternatives
Received at Scoping Meetings, August 15 and 17, 2000

- Allow all sea otters to remain in southern California. Subsidize southern California fishermen affected by sea otters and provide training opportunities to assist fishermen in finding an different profession.
- Place a moratorium on shellfisheries.
- Revise regulations to redefine what constitutes failure of the translocation program. Consider promulgating an additional regulatory test which would specify that failure to achieve carrying capacity results in a failure determination.
- Allow sea otters to remain at San Nicolas Island and eliminate the management zone. Consider authority under the Marine Mammal Protection Act to retain otters at San Nicolas island.
- Establish no-take zones for fisheries to allow fisheries and sea otters to co-exist.
- Develop educational programs to encourage people to use alternative food sources and reduce seafood consumption.
- Petition the U.S. Navy to include San Nicolas Island within the Channel Islands National Park.
- Establish a captive breeding program for sea otters and reintroduce otters to Avalon Bay, Catalina Island. Additional release sites would include harbors and bays within the cities of Santa Cruz and Morro Bay as well as Ensenada, Mexico. Increase funding for aquariums for the purpose of captive breeding.
- Eliminate all boundaries to sea otter movement.
- Move sea otters north.
- Translocate rehabilitated pups to San Nicolas Island to augment the population.
- Translocate sea otters to a location closer to the parent population.
- Combine tasks from several alternatives to create new alternatives.

Appendix 2

Written Comments Received During Scoping Period

NOTICE

This Copy of the Scoping Report for the Translocation for Southern Sea Otters Does Not Include Copies of the Written Comments Received During the Scoping Period.

A Total of 38 People Provided Written Comments to the Ventura Fish and Wildlife Office Resulting in Approximately 180 pages of Letters, Electronic Mail, and Supporting Documentation.

A Complete Set of the Comments Received May Be Viewed at the Ventura Fish and Wildlife Office's Web Site - **http://ventura.fws.gov**

Arrangements May Also Be Made to View the Comments at the Ventura Fish and Wildlife Office By Contacting Mr. Greg Sanders at (805) 644-1766.

Appendix F: Tinker, M.T., D.F. Doak, and J.A. Estes. 2008a. Using demography and movement behavior to predict range expansion of the southern sea otter. Ecological Applications 18(7):1781–1794.

Ecological Applications, 18(7), 2008, pp. 1781–1794

USING DEMOGRAPHY AND MOVEMENT BEHAVIOR TO PREDICT RANGE EXPANSION OF THE SOUTHERN SEA OTTER

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Abstract. In addition to forecasting population growth, basic demographic data combined with movement data provide a means for predicting rates of range expansion. Quantitative models of range expansion have rarely been applied to large vertebrates, although such tools could be useful for restoration and management of many threatened but recovering populations. Using the southern sea otter (*Enhydra lutris nereis*) as a case study, we utilized integro-difference equations in combination with a stage-structured projection matrix that incorporated spatial variation in dispersal and demography to make forecasts of population recovery and range recolonization. In addition to these basic predictions, we emphasize how to make these modeling predictions useful in a management context through the inclusion of parameter uncertainty and sensitivity analysis. Our models resulted in hind-cast (1989–2003) predictions of net population growth and range expansion that closely matched observed patterns. We next made projections of future range expansion and population growth, incorporating uncertainty in all model parameters, and explored the sensitivity of model predictions to variation in spatially explicit survival and dispersal rates. The predicted rate of southward range expansion (median = 5.2 km/yr) was sensitive to both dispersal and survival rates; elasticity analysis indicated that changes in adult survival would have the greatest potential effect on the rate of range expansion, while perturbation analysis showed that variation in subadult dispersal contributed most to variance in model predictions. Variation in survival and dispersal of females at the south end of the range contributed most of the variance in predicted southward range expansion. Our approach provides guidance for the acquisition of further data and a means of forecasting the consequence of specific management actions. Similar methods could aid in the management of other recovering populations.

Key words: asymptotic wave speed; Enhydra lutris nereis; *integro-difference equations; life stage simulation analysis; multistate projection matrix; range expansion; southern sea otter.*

Introduction

Data on stage-specific probabilities of survival, growth, and reproduction have long been used by ecologists to understand past and present population dynamics (e.g., Caswell 2001, Morris and Doak 2002) and can also be used for predicting future trends. This is especially important in the case of threatened or endangered species, since effective management strategies for these populations require reliable information about the life-history stages with the greatest potential for enhancing or limiting recovery (Crouse et al. 1987, Beissinger and McCullough 2002). Many rare species have been reduced to small, fragmented populations and extirpated from much of their historical range, so that recovery depends not only on enhanced population size but also on recolonization of the species' former range (Swenson 1999, Moro 2003). In addition to forecasting population growth, basic demographic and movement data provide a means for predicting rates of range expansion, using analytical tools that have been available for many years (Skellam 1951, Andow et al. 1990). For example, the study of invasive species has begun to benefit from the use of reaction–diffusion models (Shigesada et al. 1995) and integro-difference equations (Kot et al. 1996), which often provide robust predictions of invasion speed (Neubert and Parker 2004). These methods have only rarely been applied to large vertebrates (e.g., Lubina and Levin 1988, Lensink 1997, Hurford et al. 2006), but with the increasing number of threatened vertebrate populations that are reinhabiting former ranges and improving technologies to determine large-scale movement behaviors, these tools may have considerable potential value for conservation management. Here, we adapt this modeling framework to address management predictions and key concerns for a recovering carnivore population, the southern sea otter (*Enhydra lutris nereis*).

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Prior to the North Pacific fur trade of the 18th and 19th centuries, sea otters were important apex predators in nearshore coastal marine communities ranging from northern Japan to Baja California, but they were hunted to the edge of extinction by the early 1900s (Kenyon 1969). Once protected by international treaty, sea otter populations recovered over much of their former range. In California, however, the southern subspecies remains listed as threatened by the Endangered Species Act (USFWS 2003). Full recovery of this population has for decades been limited by slow population growth; at least in recent years, this problem has been largely due to elevated mortality among prime-age females (Estes et al. 2003, Gerber et al. 2004, Tinker et al. 2006). Management agencies are particularly interested in the development of a realistic predictive model of population recovery and range expansion into southern California, as this will facilitate the informed assessment of potential impacts of sea otters on important industries (e.g., fisheries, eco-tourism), potential negative effects of human activity on sea otters (e.g., risks associated with the nearshore transport and extraction of petroleum, entanglement in fishing gear, etc.), and eventual delisting of this subspecies (USFWS 2003). The existence of spatially explicit demographic and movement information for the southern sea otter over the whole of its range (Tinker et al. 2006) makes this an ideal species for developing a predictive model of population growth and range expansion for a large carnivore and for exploring the sensitivity of the model predictions to parameter estimates over multiple spatial scales.

Two prior analyses of range expansion of this population have shown the promise of demographic-movement models to successfully capture its spatial dynamics (Lubina and Levin 1988, Krkošek et al. 2007). Like many published uses of movement models, these studies focus on technical aspects of model development and validation, rather than on data quality issues or the problems inherent in making this approach directly applicable to the key concerns of conservation managers. As with management of many rare species, the management concerns about range expansion of sea otters largely involve short-term, regional predictions of distribution and population growth and also the need to directly confront uncertainty in predictions due to limited data.

In response to these needs, our goal here is to show how the marriage of two well-tested analytical techniques, population projection matrices structured by stage and region and integro-difference equations, can be adapted to make useful predictions for the management of a recovering population. To do so, we account for uncertainty in all model parameters using Monte Carlo simulations, and we use sensitivity analysis to explore and contrast the relative importance of dispersal and vital rate parameters in different portions of the range for model predictions, thereby highlighting areas in which further study will be particularly useful. We focus our analysis on southward range expansion of California sea otters, both for simplicity and because this region is of particular concern for management agencies (USFWS 2005). In this work we seek to strike a balance between relevance for applied conservation and general applicability of results: the approach we use, while obviously tailored specifically for southern sea otters, is also designed to be useful in addressing the dynamics of other recovering species.

Making careful predictions of range expansion and exploring the factors controlling these dynamics is of broad relevance in conservation. Large carnivores and mega-herbivores (especially mammals) are or once were components of most natural ecosystems, but these species have been among the first to disappear with the erosion of biodiversity (Ray et al. 2005). There is also growing evidence that many large carnivores act as keystone species (sensu Paine 1966, 1969, Power et al. 1996), exerting strong and sometimes far-reaching effects on ecosystem structure and function through top-down processes (e.g., Estes et al. 1998, Pace et al. 1999, Berger et al. 2001, Terborgh et al. 2001). For these reasons, and because these species typically require larger areas than most other species for the maintenance of viable populations, their reestablishment is viewed as an important ingredient in developing conservation strategies and restoring degraded ecosystems (Soulé et al. 2003, Ripple and Beschta 2007). As a result of focused conservation efforts, multiple large mammals are now recovering or have the potential to recover and re-expand into at least parts of their ranges (Comiskey et al. 2002, Lindsey et al. 2004, Bales et al. 2005, Kojola and Heikkinen 2006, Kojola et al. 2006, Neflemann et al. 2007), creating the need to better anticipate rates and patterns of range expansion and to determine how best to manage this population growth.

Model Development

Overview of model structure

Previous analyses suggested that spatial variation in sea otter vital rates could best be represented by dividing the California sea otter range into three contiguous regions (corresponding to the northern, central, and southern portions of the range) among which there were substantial differences in annual survival (Tinker et al. 2006). To facilitate the tracking of simulation results at the range boundaries, we defined two additional regions that corresponded to the expanding frontal zones at the north and south ends of the current range of sea otters in California (Fig. 1): in so doing we assume that demographic rates and dispersal patterns for otters in the southern frontal zone were identical to those in the adjacent southern region, while the otters in the northern frontal zone were governed by the rates estimated for the adjacent northern region.

For each of the five regions we modeled demographic processes using a stage-based projection matrix to describe annual transitions between four age classes:

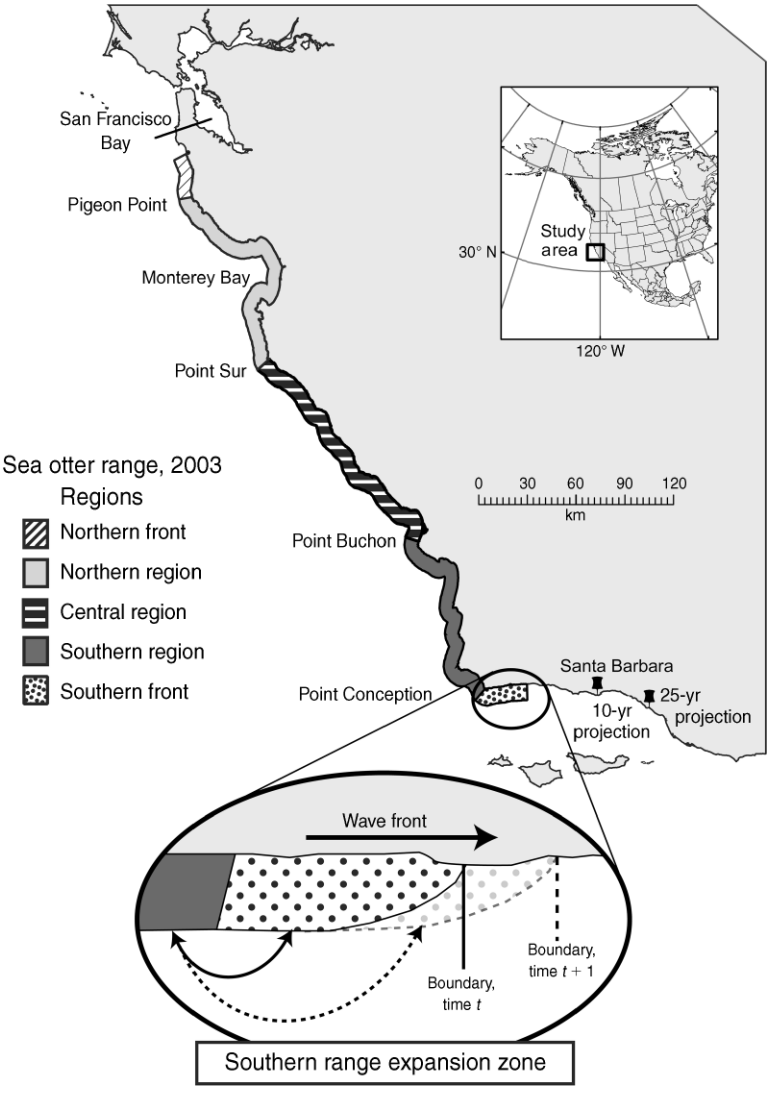

FIG. 1. Map of central California, USA, showing current range of the southern sea otter (*Enhydra lutris nereis*; excluding San Nicolas Island) and identifying the spatial arrangement of the five regions used for the simulation model. The dynamics of range expansion (as modeled using integro-difference equations) are illustrated in a blow-up of the southern frontal zone. The point estimates for the 10-year and 25-year projections of the location of the southern range end boundary are also shown, based on the results of the simulation model (see Table 4).

juveniles (defined as one year post-weaning), subadults (two- and three-year-olds), prime-age adults (4–10-year-olds), and aged adults (11 years of age or older). We used a stage-structured matrix (rather than age-structured) to simplify interpretation of results and for consistency with available data sets. Transitions were tracked separately for females and males, resulting in a two-sex 8×8 demographic matrix, **A**, for each region (Table 1). Three types of transition were identified: G represents survival and growth, or the probability of individuals surviving for one year and advancing to the next age class; P represents "persistence," or survival without transition to the next age class; and R represents survival and successful reproduction (for our purposes, an individual female is considered to have successfully reproduced if she gives birth and successfully weans a pup; i.e., she contributes a single viable juvenile to the population). To estimate P, G, and R we used standard equations for deriving fixed-stage-duration transition probabilities from underlying vital rates (Caswell 2001):

$$P_{j,i} = s_i \times \left[1 - \frac{(s_i/\lambda)^{T_i} - (s_i/\lambda)^{T_i-1}}{(s_i/\lambda)^{T_i} - 1}\right] \quad (1)$$

$$G_{j,i} = s_i \times \left[\frac{(s_i/\lambda)^{T_i} - (s_i/\lambda)^{T_i-1}}{(s_i/\lambda)^{T_i} - 1}\right] \quad (2)$$

$$R_{j,i} = s_i \times 1/2b_i \times w_i \quad (3)$$

TABLE 1. Representation of the demographic matrix **A** used to project annual demographic transitions for southern sea otters (*Enhydra lutris nereis*) in California, USA.

Age	j = stage at time $t+1$	i = stage at time t							
		1	2	3	4	5	6	7	8
Female									
Juvenile	1	0	$R_{1,2}$	$R_{1,3}$	$R_{1,4}$	0	0	0	0
Subadult	2	$G_{2,1}$	$P_{2,2}$	0	0	0	0	0	0
Adult	3	0	$G_{3,2}$	$P_{3,3}$	0	0	0	0	0
Aged adult	4	0	0	$G_{4,3}$	$P_{4,4}$	0	0	0	0
Male									
Juvenile	5	0	$R_{5,2}$	$R_{5,3}$	$R_{5,4}$	0	0	0	0
Subadult	6	0	0	0	0	$G_{6,5}$	$P_{6,6}$	0	0
Adult	7	0	0	0	0	0	$G_{7,6}$	$P_{7,7}$	0
Aged adult	8	0	0	0	0	0	0	$G_{8,7}$	$P_{8,8}$

Notes: Transitions are shown for eight stages, with 1–4 corresponding to female age classes and 5–8 corresponding to male age classes. Following standard convention, matrix elements represent transitions made from stage i (as indicated in the column headers) to stage j (as indicated in the rows of the second column) between year t and year $t+1$. The three possible transitions are G (survival and growth to the next age class), P (survival without transition to the next age class), and R (survival and successful reproduction).

where T_i is the stage duration (in years) for age/sex class i, λ is the annual rate of population growth, s_i is the annual survival rate for an individual of stage i, b_i represents the birth rate (assuming a 1:1 sex ratio at birth), and w_i is the weaning success rate for a female of stage i. Eqs. 1 and 2 were solved initially with $\lambda = 1$ and then updated with the new value of λ (derived algebraically from the resulting matrix) and resolved until the value of λ stabilized (Caswell 2001). Eqs. 1–2 assume that vital rates are constant, there is a stable age distribution, and there is no explicit density dependence. While the first two of these assumptions were violated to some degree, as explained below, Monte Carlo simulations indicated that the approximations provided sufficiently accurate results within the projection period and range of λ values evaluated. Specifically, at the end of a 25-year projection period we found negligible differences between age-structured matrices and their stage-structured equivalents with respect to final age composition and abundance estimates.

In addition to describing vital rates within each of the five regions, our model also had to account for dispersal of individuals between regions. Accordingly, dispersal rates for each age/sex class (calculated as explained below) were incorporated into a movement matrix, **M**, whose nonzero diagonal elements consisted of the estimated annual probabilities of moving to region y from region x for an otter of stage i ($m^i_{y,x}$). The **M** and **A** matrices were then combined, using methods described in detail by Hunter and Caswell (2005), in order to project changes to the population vector, a 40×1 array giving the number of animals in age/sex class i within region x at time t. For computational simplicity we assumed that individuals disperse at the start of each year, after which survival, growth, and reproduction occur according to the vital rates associated with the new location (Hunter and Caswell 2005). This approach of combining separate movement and demography matrices simplifies bookkeeping for our multisite models, but results in the same final structure as that used by other studies of combined demography and dispersal processes (Wootton and Bell 1992, Kauffman et al. 2004, Gerber et al. 2005).

Calculating dispersal rates

To calculate dispersal probabilities, we first noted that variation in annual net linear displacement (sensu Turchin 1998) of sea otters in California was well described by a Laplace distribution with parameter $\sigma_{i,x}$ (Fig. 2). The parameter $\sigma_{i,x}$ represents the expected net annual dispersal distance by an otter of stage i located at x' (where x' is defined as a point on the coast somewhere within subpopulation x). Note that for our current purposes we use the term "dispersal" to describe the average probability of an individual moving from x' to y' between time t and time $t+1$; this definition makes no reference to the biological cause or behavioral significance of such movements, which likely differ between age and sex classes. The Laplace distribution, which consists of two back-to-back exponential distributions, is convenient for modeling sea otter movements in California because animals are restricted to essentially one-dimensional movement north or south along the coastline (Lubina and Levin 1988, Krkošek et al. 2007). Other probability distributions can also be used to model long-distance movements, including so-called "fat-tailed" or leptokurtic dispersal kernels (Krkošek et al. 2007). Like Krkošek and co-authors, we found that fat-tailed kernels provided a marginally better fit to most of our dispersal data, especially those for juvenile males, but that use of these distributions led to an inadequate description of medium- to long-term population range expansion, as we describe in the following section.

The annual probability that an otter of stage i located at point x' disperses into region y ($m^i_{y,x'}$) was calculated as the absolute difference between Laplace cumulative

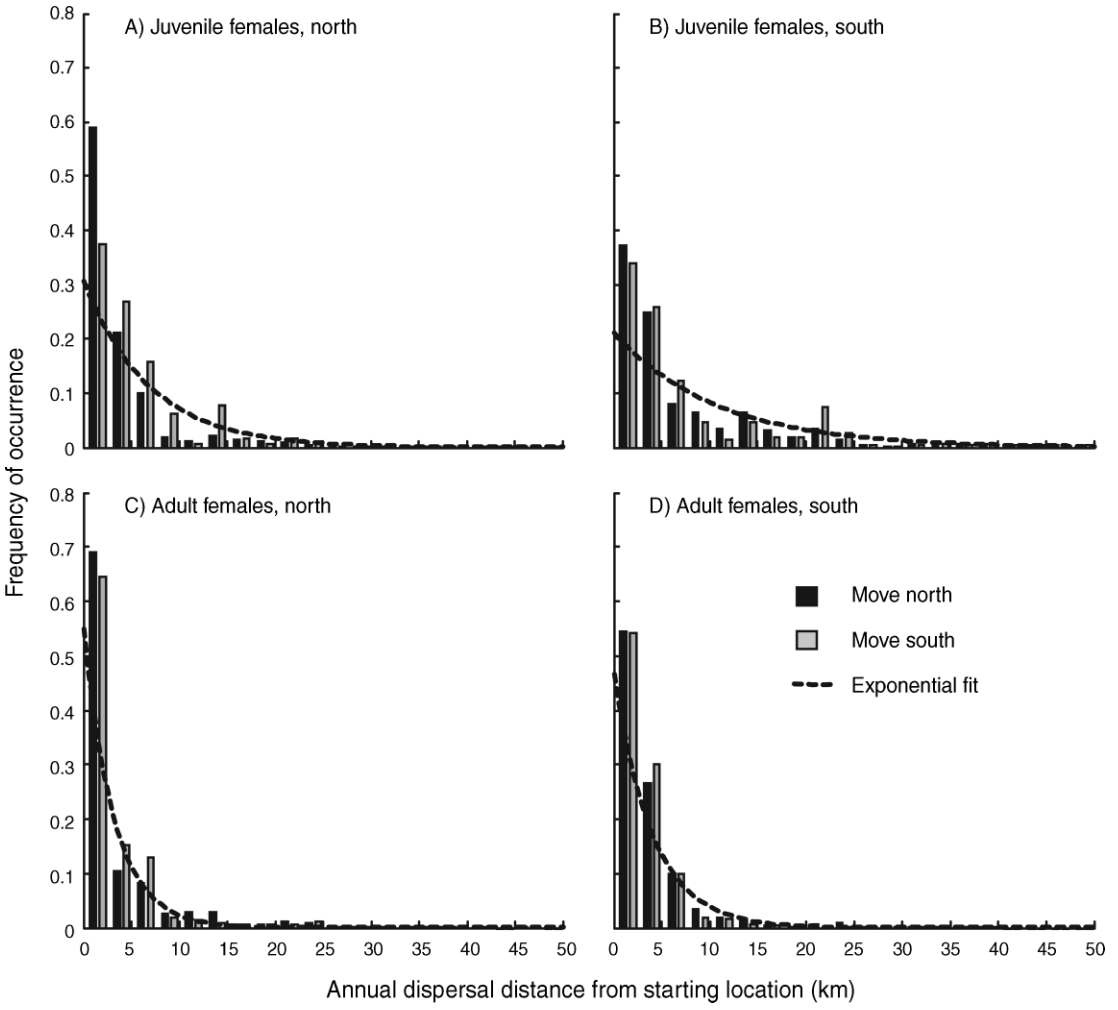

FIG. 2. Annual dispersal distance frequency histograms for juvenile/subadult females (top panels) and adult females (bottom panels) in the northern half of the range (left panels) and in the southern half of the range (right panels). Black bars show northward movements, and gray bars show southward movements. The corresponding Laplace density functions (dashed lines) are superimposed over the histograms. Note that the distributions for juvenile females show greater dispersion than those of adults, with the greatest dispersion in the southern portion of the range, a tendency that is reflected by a higher value of the Laplace distribution scale parameter, σ (see Table 3).

density functions evaluated at $|y_N - x'|$ and $|y_S - x'|$, where y_N and y_S are the northern-most and southern-most points along the coast in region y. We specified all locations and distances in terms of 500-m units along the one-dimensional axis described by the 10-m bathymetric contour, increasing from north to south (with "0" defined as the southern tip of the Golden Gate Bridge at the entrance to San Francisco Bay); we refer to this scale hereafter as the "as-the-otter-swims" or ATOS line (Pattison et al. 1997). We assumed that, for the purpose of measuring annual movement distances, all points within a 500-m interval (one ATOS unit) would be adequately represented by an integer value of x', so that the total probability of dispersal from region x to region y can be approximated as follows:

$$m^i_{y,x} = \sum_{x'=x_N}^{x_S} (m^i_{y,x'})p(x') \quad (4)$$

where $p(x')$ represents the probability that an individual from region x would be located at x' and thus must sum to 1 for $x_N \leq x' \leq x_S$. Based on the most recent 10 years of annual rangewide sea otter census data (which includes the ATOS location of each otter counted; data *available online*),[5] we calculated $p(x')$ as the cumulative number of otters observed at x' divided by the total number of otters observed anywhere between x_N and x_S. We solved Eq. 4 for each pair of regions, including cases of $y = x$ (the probability of remaining within the same region).

[5] ⟨http://www.werc.usgs.gov/otters/ca-surveys.html⟩

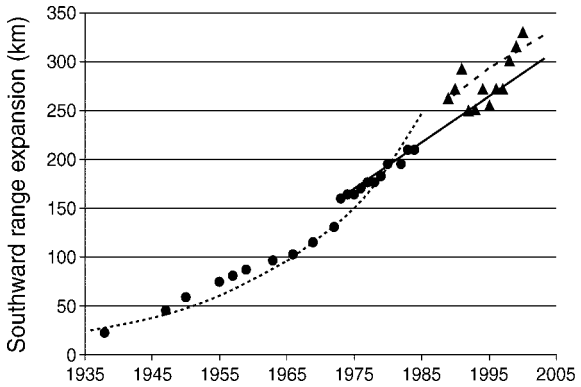

FIG. 3. Historical pattern of southward range expansion for sea otters in central California, from 1935 through 2005. The vertical axis shows the distance south of the initial population hub (Bixby Creek, in Big Sur) at which the southern range boundary was located at various points in time. Points prior to 1985 (circles) represent the "best-guess" locations, based on various survey techniques and anecdotal reports of sea otter sightings, while post-1985 data (triangles) represent standardized survey data (see footnote 5). Three hind-cast predictions of expected range expansion are shown, based on alternate methodological approaches: a linear rate of invasion predicted by a simple diffusion model (solid line; Lubina and Levin [1988]), an accelerating rate of invasion predicted by solving integro-difference equations with a fat-tailed dispersal kernel (dotted line; Krkošek et al. [2007]), and a linear rate of invasion predicted by solving integro-difference equations with an exponential dispersal kernel (dashed line; current analysis).

Range expansion

The multistate matrix model described in *Overview of model structure* accounts for movement and demographic processes within the existing range of the southern sea otter at time t. It does not, however, account for the continued expansion of the existing range boundaries to the north and south. In order to predict the rate of expansion of the population into unoccupied habitat, we used a stage-structured integro-difference equation model (following Neubert and Caswell 2000) to solve for the minimum asymptotic speed of the "traveling wave" formed by the population front (Fig. 1). The so-called "linear conjecture" hypothesizes that asymptotic wave speed will provide a reasonable prediction of population invasion speed so long as various assumptions are met (Weinberger 1982, Kot et al. 1996, Neubert and Parker 2004), including spatial and temporal environmental homogeneity (but see Neubert et al. 2000, Weinberger 2002) and lack of Allee effects or long-distance density dependence (Weinberger 1982). It has been found that Allee effects can result in invasion speeds that are slower than predicted (Hurford et al. 2006), but such effects seem unlikely for sea otters because individuals are not reliant on any sort of social group structure, and historical data indicate that sea otter populations have often increased rapidly from small initial population sizes (Jameson et al. 1982, Estes 1990). Moreover, a previous analysis of historical sea otter range expansion (Krkošek et al. 2007) has demonstrated reasonable agreement between observed invasion speed and that predicted by integro-difference equations. In that analysis, Krkošek et al. (2007) found that a variety of dispersal kernels were successful at predicting rates of range expansion, and although there was no obvious "best choice" they concluded that the accelerating invasion speeds predicted by fat-tailed kernels seemed most appropriate for explaining range expansion prior to 1980. With the addition of over 20 years of data (and a recognition of the dubious nature of many of the early 20th century data points used in past analyses) we, in contrast, found that a linear invasion speed is more consistent with the observed pattern of range expansion and especially so with the standardized survey data available from 1982 through the present (Fig. 3). For this reason, and because of the good fit between Laplace distributions and our telemetry-based dispersal data (Fig. 2), we formulated integro-difference equations using exponential dispersal kernels.

To predict southward range expansion, we used the demographic matrix **A** (Table 1) for the southern region and a dispersal moment-generating function matrix $\mathbf{D}(\omega)$, where ω is the parameter that determines the "shape" of the traveling wave at the population front. The matrix $\mathbf{D}(\omega)$ has the same dimensions as **A**, but its elements, $d_{j,i}(\omega)$, all equal 1 except for those on the diagonal and subdiagonal, which were set equal to the moment-generating functions of stage-specific exponential dispersal kernels evaluated at ω:

$$d_{j,i}(\omega) = \frac{1}{1 - \sigma_i^2 \omega^2} \tag{5}$$

where σ_i is the Laplace parameter for an animal of age/sex class i located in the southern portion of the range (Neubert and Caswell 2000). Element-by-element multiplication of the demographic matrix and moment-generating function matrix $[\mathbf{A} \circ \mathbf{D}(\omega)]$ produced a new matrix, $\mathbf{H}(\omega)$, from which we first calculated the maximum eigenvalue, $\rho_1(\omega)$, and then estimated the asymptotic wave speed (c):

$$c = \frac{1}{\omega^*} \ln \rho_1(\omega^*) \tag{6}$$

where ω^* is defined as the value of ω that minimizes "c" in Eq. 6. We used a similar approach to predict northward range expansion, substituting vital rates and dispersal kernels corresponding to the northern region. By using regionally specific parameter estimates for predicting asymptotic wave speed to the north and south, we allowed for differing rates of range expansion at either end of the range, consistent with historically observed patterns for this population (Lubina and Levin 1988, Riedman and Estes 1990). In so doing we assumed that animals from the range center do not directly contribute to range expansion or, more precisely, that they must first disperse to the northern or southern regions; this seems a reasonable assumption based upon

TABLE 2. Age- and sex-specific annual survival estimates used for the simulation model.

	Females				Males			
Study period	Juvenile	Subadult	Adult	Aged adult	Juvenile	Subadult	Adult	Aged adult
North								
1984–1986	0.85 (0.117)	0.88 (0.117)	0.93 (0.088)	0.65 (0.145)	0.88 (0.173)	0.86 (0.173)	0.7 (0.167)	0.50 (0.179)
1992–1994	0.86 (0.008)	0.86 (0.005)	0.89 (0.006)	0.76 (0.032)	0.77 (0.026)	0.77 (0.015)	0.79 (0.012)	0.62 (0.056)
1995–2001	0.83 (0.015)	0.83 (0.008)	0.86 (0.007)	0.71 (0.040)	0.73 (0.033)	0.72 (0.017)	0.75 (0.018)	0.56 (0.049)
Central								
1984–1986	0.85 (0.117)	0.88 (0.117)	0.93 (0.088)	0.65 (0.145)	0.88 (0.173)	0.86 (0.173)	0.70 (0.167)	0.50 (0.179)
1992–1994	0.89 (0.008)	0.89 (0.004)	0.89 (0.005)	0.71 (0.028)	0.82 (0.025)	0.81 (0.014)	0.80 (0.014)	0.56 (0.044)
1995–2001	0.87 (0.014)	0.86 (0.008)	0.86 (0.006)	0.67 (0.032)	0.78 (0.023)	0.77 (0.013)	0.75 (0.018)	0.51 (0.036)
South								
1984–1986	0.85 (0.117)	0.88 (0.117)	0.93 (0.088)	0.65 (0.145)	0.88 (0.173)	0.86 (0.173)	0.70 (0.167)	0.50 (0.179)
1992–1994	0.91 (0.019)	0.90 (0.012)	0.90 (0.010)	0.74 (0.032)	0.84 (0.028)	0.84 (0.020)	0.82 (0.017)	0.59 (0.050)
1995–2001	0.88 (0.017)	0.88 (0.013)	0.88 (0.011)	0.69 (0.038)	0.81 (0.021)	0.80 (0.016)	0.78 (0.021)	0.54 (0.043)

Notes: Values are reported as means with SE in parentheses. Estimates for 1984–1986 are based on values reported by Siniff and Ralls (1991). All other estimates are taken from Tinker et al. (2006).

typical annual dispersal distances measured from radio-tagged animals (Table 3).

We incorporated the resulting predictions of the rate of range expansion into projections of population growth by annually incrementing outward the areas encompassed by the two frontal zones: only the outer boundaries of the two frontal zones were adjusted, while all other boundary locations were held fixed. Each year's range expansion therefore impacted the following year's population dynamics through its effect on the solution to Eq. 4. The distribution of otters within each frontal zone was also recalculated each year: specifically, adjustments were made such that the relative abundance of animals at incremental distances in from the frontal boundary (the "shape" of the traveling wave) was held constant (Fig. 1).

MODEL PARAMETERIZATION

To account for the effects of parameter uncertainty on predictions of future population dynamics and sensitivity estimates, we used multiple estimates of demographic rates that spanned the range of historically observed population dynamics in California (Gerber et al. 2004). The first set of age- and sex-specific survival rate estimates used were taken from the mid-1980s (Siniff and Ralls 1991), a period when the population was growing at approximately 5% per year (the maximum historical rate of population growth for mainland California). Two additional sets of maximum-likelihood survival estimates were used (taken from Tinker et al. 2006): one corresponding to a period of slow population growth (1992–1994) and one to a period of slow population decline (1995–2001). The estimates from the 1980s did not account for spatial structure, while the latter two sets of estimates varied between the three main regions (Table 2). In contrast with the considerable variation in survival reported for sea otters, accumulating evidence suggests that there has been very little spatial or temporal variation in reproduction parameters over the past 20 years (Estes et al. 2003, Tinker et al. 2006); accordingly, we used a single set of age-specific reproductive rates for all simulations. Following Tinker et al. (2006), the age of first reproduction in females was assumed to occur at three years, the annual birth rate was set to 0.98 for all age classes, and age-specific weaning success rate was set to 0.37 for subadults, 0.58 for prime-age adults, and 0.72 for aged adults.

For each of the three sets of vital rate estimates (Table 2) we used the estimated means and standard errors to create sampling distributions with which to generate random sets of vital rates (following Gerber et al. 2004, Buckley et al. 2005). In order to create biologically realistic random survival schedules that maintained appropriate life-history-based correlations (i.e., recognizing that survival rates among age classes tend to covary), we first back-transformed each set of male and female stage-specific survival estimates into a logit function governing age effects on the annual rate of survival, s:

$$s_z = \frac{\exp[\theta_1 + \theta_2(z) + \theta_2(z^2)]}{1 + \exp[\theta_1 + \theta_2(z) + \theta_2(z^2)]} \quad (7)$$

where z is the median otter age (in years) for each stage. Maximum-likelihood techniques were used to find best-fit estimates of the three logit parameters (θ_1, θ_2, and θ_3) and the associated variance–covariance matrix. Assuming approximately normally distributed parameters in the logit function, we generated many random sets of logit parameter values such that the estimated means and variances/covariances were maintained (Morris and Doak 2002), and these were used to create random but "plausible" stage-specific survival rates.

Movement probabilities were estimated by fitting Laplace probability distributions to annual dispersal distances recorded from radio-tagged sea otters (Fig. 2). Weekly locations were collected from study animals using standard VHF radio telemetric techniques (Ralls et al. 1996, Tinker et al. 2006), and annual dispersal

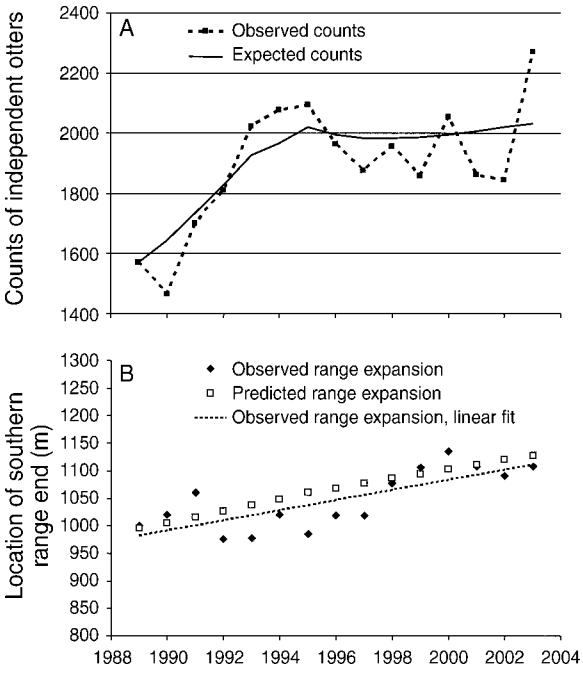

FIG. 4. Results of a hind-cast simulation of population dynamics for the southern sea otter population over the years 1989–2003. (A) Predicted population counts are plotted with actual population counts for comparison. (B) Predicted range expansion to the south is plotted with the observed range expansion for comparison: range expansion is shown as changes to the southern range end boundary (expressed as 500-m intervals along the "as-the-otter-swims" or ATOS line: see *Model development: Calculating dispersal rates* for further explanation) as a function of time. A linear, least-squares curve was fit to the observed data (dotted line) to highlight the close correspondence between the predicted and observed mean rate of southward range expansion.

distances were calculated as net linear displacement between an animal's location at week 0 and week 52 (distances were measured in kilometers along the ATOS line, where 1 km = 2 ATOS units). As with demographic rates, data were available from two time periods: the mid-1980s (Siniff and Ralls 1991) and 2001–2004 (Tinker et al. 2006). In order to obtain unbiased estimates of dispersal parameters while at the same time quantifying parameter uncertainty, a resampling approach was used for analysis: 10 animals were selected randomly (with replacement) from the total sample of animals available for a given age/sex group, study period, and region, the start date (week 0) was randomly selected, and net annual displacement was calculated based on the animal's location 52 weeks later. This process was repeated for 10 000 iterations, and then we used maximum-likelihood methods to fit Laplace probability distributions for four age/sex classes (N = 17 juvenile/subadult females, 45 adult females, 12 juvenile/subadult males, and 35 adult males). The juvenile/subadult age classes and adult/aged-adult age classes were pooled because there were insufficient sample sizes (particularly for juveniles) to allow calculation of separate distributions, but also because previous work suggested that this was an appropriate classification scheme for movement (Ralls et al. 1996). Sample size constraints precluded separate analyses for all three regions: in the case of the 1980s sample we pooled data from all areas, while for the latter sample there were sufficient data available to conduct two analyses, one for animals north of Point Sur (the northern region) and a second for animals south of Point Sur (the central and southern regions; Fig. 1). For each age/sex class, study period, and region we calculated the maximum-likelihood estimate of the Laplace parameter, $\sigma_{i,x}$, and the standard error associated with this estimate (Table 3) and used these values to parameterize movement matrices and dispersal kernel functions in model simulations.

Simulation Methods

Although it would have been possible to initialize the population vector using the stable stage distribution (SSD) associated with a particular demographic schedule (Caswell 2001), there was evidence for recent changes to the survival schedule of southern sea otters that would have precluded convergence on the SSD (Estes et al. 2003, Tinker et al. 2006). Consequently, prior to running forward simulations we ran an historical simulation in order to generate appropriate present-day stage structures for each region. We initialized 1989 population vectors for each region by multiplying the 1989 spring census counts by the SSD associated with the demographic rates of the 1980s (Table 2), which we assumed were approximately constant through to the early 1990s (Estes et al. 2003). We then projected 15 years of population dynamics (Fig. 4), calculating all demographic transitions, dispersal, and range expansion rates as explained in *Model development*, above. Specifically, we used the estimates for $\sigma_{i,x}$ calculated from the 2001–2004 data set (Table 3), and we adjusted vital rates for the fourth through 15th years of the projection (1992–2003) to equal the appropriate maximum-likelihood estimates (Table 2). The result of this historical projection was an expected population vector for 2004, which was used to initialize all forward simulations. This exercise also provided the opportunity to compare expected vs. observed population counts and expected vs. observed range expansion, thereby allowing us to graphically examine the performance of our model structure and parameter values.

After initializing the population vector we conducted 75 000 forward simulations, each using a different combination of stage- and location-specific demographic rates and dispersal parameters. We first created 500 unique sets of dispersal kernels from randomly generated Laplace distribution scale parameters: in particular, 500 random values of $\sigma_{i,x}$ were generated such that the overall mean and standard error for a given age/sex class and region corresponded to that shown in Table 3 (1980s estimates and 2001–2004 estimates were repre-

TABLE 3. Maximum-likelihood estimates of the Laplace distribution parameter, σ (in kilometers), used to parameterize dispersal kernels for the simulation model.

Region, study period	Females		Males	
	Juveniles and subadults	Adults	Juveniles and subadults	Adults
Whole range, 1984–1986	17.54 (3.53)	5.33 (0.73)	37.82 (4.41)	9.1 (1.66)
North of range, 2001–2004	10.52 (3.16)	4.82 (0.5)	91.53 (15.24)	7.27 (2.11)
South/center of range, 2001–2004	16.48 (3.36)	6.13 (1.8)	47.76 (10.37)	25.41 (7.11)

Notes: Estimates of σ represent an animal's expected dispersal distance northward along the coast, given that it moves to the north, or its expected dispersal distance southward, given that it moves south, assuming equal probability of northward or southward movement. Numbers in parentheses are standard errors associated with the maximum-likelihood estimates.

sented equally). For each of the resulting 500 movement matrices we created 150 randomly generated demographic schedules with each of the three sets of demographic estimates represented equally (Table 2). For each of the 75 000 resulting parameter sets, population dynamics and interregional movements were projected for 25 years into the future (Hunter and Caswell 2005) in conjunction with solution of the integro-difference equations to calculate annual range expansion. We defined the initial southern and northern range boundaries as the two points on the ATOS line spanning 99.5% of the spring survey count (North = ATOS 100, south = ATOS 1160, based on 2003–2004 survey data), recognizing that this designation is somewhat arbitrary and that a few individual animals will occasionally be observed well beyond these boundaries.

We summarized simulation results by tabulating three statistics: the predicted rate of range expansion to the south (in units of kilometers per year), the predicted number of independent otters south of Point Conception at the end of each simulation, and predicted growth of the population as a whole (presented as λ, the mean annual rate of growth calculated from simulation results, which we distinguish from the theoretical asymptotic growth rate derived algebraically from the projection matrix). We report the mean, median, mode, and variance for these three statistics, as well as their 95% confidence limits. We then conducted perturbation analysis (Caswell 2001) to determine the relative importance of model parameter values (specifically, the location- and stage-specific vital rates and dispersal parameters) for each model prediction. In matrix models, the potential contribution of a parameter to variation in some demographic statistic can be expressed as an analytically derived sensitivity value or an elasticity value (Caswell 2001), the latter being a measure of proportional sensitivity to proportional perturbations in a given parameter. Accordingly, for each unique parameterization of multistate matrix **B** we calculated elasticities for asymptotic population growth rate (following Caswell 2001) and asymptotic wave speed (following Neubert and Caswell 2000) with respect to vital rates and dispersal parameters; we report mean elasticity values averaged across all iterations. Next, recognizing that the potential contribution of model parameters to variation in demographic statistics may differ somewhat from the realized contribution to observed variance (e.g., Crooks et al. 1998), we performed a retrospective perturbation analysis, or "life stage simulation analysis" (LSS; Wisdom et al. 2000). Specifically, we estimated the proportion of variation in the three simulation response variables, the rate of southward range expansion, rangewide population growth, and population growth south of Point Conception, explained by each of the location- and stage-specific demographic and dispersal parameters. We used a general linear model to analyze variation of each response variable as a function of all model parameters and estimated variance components by calculating partial coefficients of determination (r_p^2), following Neter et al. (1990). Both elasticity analysis and LSS analysis can be informative, although they often provide quite different insights into model dynamics and conservation implications (Wisdom et al. 2000, Caswell 2001). We summarize both sets of results for the population as a whole and separately for each region. All results are reported along with standard errors and 95% confidence limits.

RESULTS

The historical projection simulation resulted in population dynamics that were consistent with observed survey counts over the same period and illustrate the variability in potential growth rates (reflected as changes in the slope of the "expected counts" trend line in Fig. 4A) that were possible under the simulation parameters. There was also close agreement between actual southward range expansion over the past 15 years and the predicted population wave speed. Although the position of the southern range boundary from year to year was highly variable, the long-term trend was well fit by a linear expansion rate of ~4.61 km/yr ($R^2 = 0.59$). This average realized rate was very close to our mean predicted rate of expansion over the same period (4.73 km/yr; Fig. 4B), as calculated by solving integro-difference equations that were based on demographic and dispersal data entirely independent from the range limit data.

The mean predicted rangewide annual rate of population increase (λ) across all forward simulations was 1.03 (see Table 4 for a complete list of simulation

TABLE 4. Summary of results from simulations.

Variable	Mean	SE	Median	Mode	95% CL
Annual rate of rangewide population increase (λ)	1.031	0.0203	1.037	1.037	0.996, 1.066
No. independents south of Point Conception after 10 years	112	15	112	107	69, 163
No. independents south of Point Conception after 25 years	395	78	382	332	148, 761
Rate of range expansion to the south (km/yr)	5.22	1.012	5.17	4.95	3.33, 7.11
Location of the southern range boundary after 10 years (ATOS)	1264		1263	1259	1227, 1302
Location of the southern range boundary after 25 years (ATOS)	1317		1315	1308	1260, 1373

Notes: For each variable we show the mean value from all simulations, the standard error of the mean, the median and mode (most frequently observed value), and the lower and upper 95% confidence limits for the mean, as based on simulation results. Note that the last two variables specify the geographic location along the California coast designating the southernmost end of the sea otter range at 10 and 25 years into the future, measured in "ATOS" units (500-m intervals along the "as-the-otter-swims" line; see *Model development: Calculating dispersal rates* for further explanation).

summary statistics). The rate of population increase to the south of Point Conception surpassed that of the rest of the population in almost all instances, with 95% of the simulations resulting in an annual growth rate in this southernmost population segment of 4–20%. The elevated rate of increase to the south was partly attributable to a high intrinsic rate of growth, but also reflected dispersal from other portions of the population. This interaction between dispersal and local demography resulted in continued range expansion to the south in virtually all simulations: the median predicted wave speed was 5.2 km/yr over the 25-year projection. This rate of southward range expansion would mean that after 10 years the range boundary will have moved to the proximity of Santa Barbara and after 25 years to a location just south of Carpinteria (Fig. 1), although there was a great deal of variation around these mean estimates (Table 4).

The predicted rate of range expansion was sensitive to both dispersal and survival rates, although the estimated importance of these two sets of parameters differed between the analytical elasticity analysis and the retrospective LSS analysis (Fig. 5). Elasticity analysis indicated that changes in survival rates would have the greatest potential effect on asymptotic wave speed, while the LSS analysis showed that variation in dispersal rates contributed most to variance in model predictions of southward rate of range expansion. In spite of this difference, the two analyses were consistent with respect to the relative rankings of different age classes: variation in adult female survival contributed more to variance in range expansion than survival of older or younger animals, while the dispersal of female juveniles and subadults had more impact on model predictions than dispersal of adult females (Fig. 5).

Rangewide population growth (λ) was far more sensitive to survival rates than to dispersal parameters: this was true both for the elasticity analysis (Table 5) and the LSS analysis (Fig. 6A). As was the case with wave speed elasticities, adult female survival had the greatest potential effect on λ, and this age-specific pattern also applied to reproduction parameters (although survival contributed far more to variance in λ than reproduction; Table 5). Both the elasticity analysis

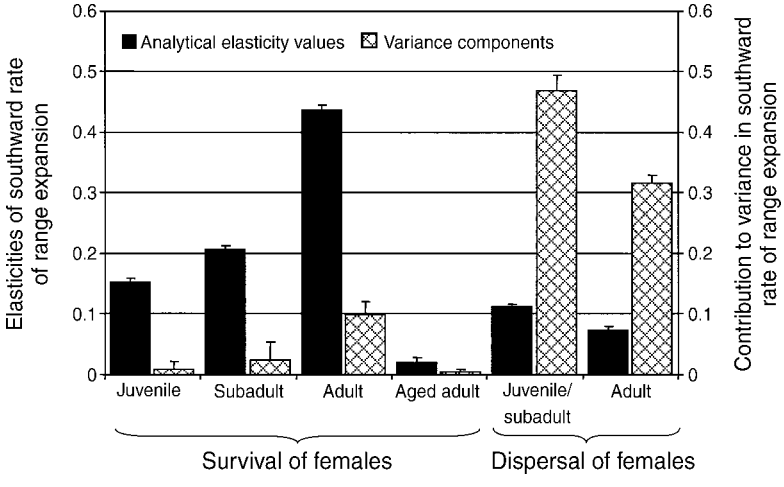

FIG. 5. Results of two perturbation analyses conducted to measure the sensitivity of the rate of southward range expansion to variation in model parameters (means + SE). Analytical elasticity values (solid bars) indicate the proportional variation in wave speed that will occur in response to proportional perturbations in age-specific movement and dispersal parameters, while variance components (hatched bars) indicate the relative proportion of variance in simulation results attributable to variation in each parameter, based on life stage simulation (LSS) analysis. Data are for female sea otters, by age.

TABLE 5. Elasticity of rangewide population growth to perturbations in age-specific and location-specific demographic rates and dispersal parameters.

Parameter	Portion of range			Total (rangewide)
	North	Central	South	
Reproduction				
Subadult	0.0074	0.0124	0.0071	0.0269
Prime-age adult	0.0276	0.0463	0.0263	0.1003
Aged adult	0.0062	0.0102	0.0058	0.0222
Subtotal	0.0411	0.0690	0.0392	0.1494
Survival				
Juvenile	0.0405	0.0709	0.0401	0.1515
Subadult	0.0783	0.1364	0.0779	0.2925
Adult	0.1469	0.2417	0.1368	0.5254
Aged adult	0.0190	0.0317	0.0183	0.0690
Subtotal	0.2442	0.4098	0.2330	0.8870
Dispersal				
Juvenile/subadult	0.0014	−0.0010	−0.0017	0.0041
Adult	0.0005	−0.0004	−0.0019	0.0028
Subtotal	0.0019	−0.0014	−0.0036	0.0069

and LSS analysis indicated that survival of animals in the central region had the greatest effect on rangewide population growth, while survival of animals in the northern and especially in the southern regions contributed less to variance in λ (Fig. 6A). Not surprisingly, this spatial pattern of survival sensitivities was reversed when we considered only population growth south of Point Conception (the southern frontal zone): survival of animals in the southern region contributed far more to the realized variance in this statistic than survival in the center or north of the range (Fig. 6B). Even more striking was the increase in the relative importance of dispersal: variation in dispersal parameters in the southern and central regions contributed most of the variance in the predicted number of animals south of Point Conception after 25 years (Fig. 6B). Female dispersal had greater effects on the rate of population increase south of Point Conception than did male dispersal (summed variance components for females = 0.497, summed variance components for males = 0.156), despite the fact that males typically exhibit greater annual dispersal distances than females and that most of the animals south of Point Conception at the present time are males.

DISCUSSION

As programs to reintroduce, or simply reduce the persecution of, wide-ranging species occur, the ability to accurately understand and predict population growth and range expansion becomes a critical management need. The predictions of our hind-cast model closely matched the historical data on rates of southward range expansion, supporting previous assertions (Lubina and Levin 1988, Krkošek et al. 2007) that estimation of asymptotic wave speed can be a useful technique for predicting range expansion of sea otters. As we show, these models can also give insight into how movement behaviors and demographic rates interact to control range expansions. Such analyses are most valuable for managers, as they allow predictions of the factors limiting recovery and also the key research and monitoring needs for reaching better predictions of recovery rate and pattern. By incorporating structured matrix methods, which are now standard for many demographic analyses (Caswell 2001, Morris and Doak 2002), into models of range expansion, we have been able to make the outputs of this modeling method far more useful for management of this population.

While it is particularly easy to apply demographic spread models to a population that is expanding relatively smoothly along a one-dimensional axis, similar approaches have been used successfully to predict invasion speed in two dimensions and in fluctuating environments (Neubert et al. 2000, Weinberger 2002, Neubert and Parker 2004). Because it can incorporate information on stage-specific and location-specific dispersal probabilities, vital rates, and population structure, the integro-difference model we present here also provides flexibility to explore the effects of regional variation and investigate the role of specific life-history processes in driving range expansion. Simple diffusion models (e.g., that were used to model invasion

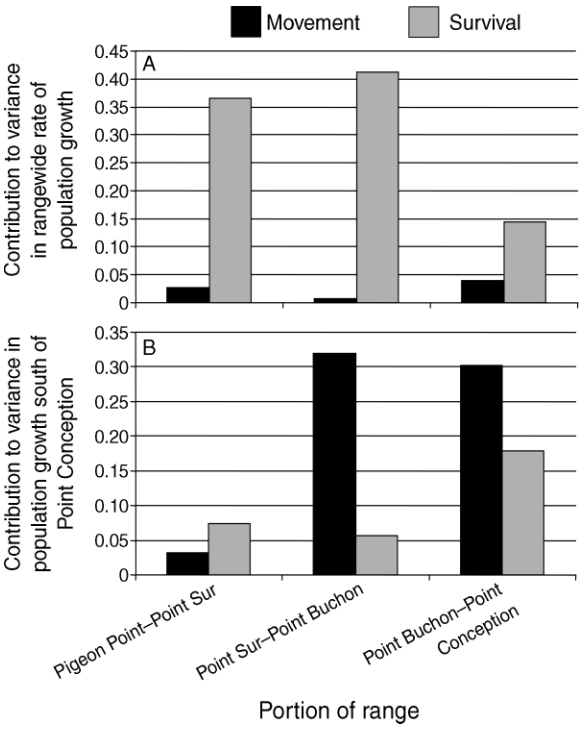

FIG. 6. Results of a perturbation, or life stage simulation (LSS) analysis, showing the relative proportion of the variance in simulation results (measured as partial coefficients of determination, r_p^2) explained by variation in movement parameters and survival parameters in different portions of the range. (A) Contribution to variance in rangewide population growth. (B) Contribution to variance in population growth south of Point Conception, California, USA.

speed in sea otters by Lubina and Levin [1988]) are conceptually simpler and require fewer data for parameterization, but they lack the ability to tie individual performance (often the target of conservation management) to population-level behavior. Although simplicity is clearly a desirable trait in any modeling exercise, the greater model complexity we employ is necessary for generating predictions of transient dynamics at regional scales, and the existence of reliable data on spatial structure with respect to density, stage-specific vital rates, and dispersal distance makes it possible to parameterize these more complex models. One key advantage of the explicit consideration of parameter uncertainty that we include in our analysis is also that it allows us to gauge whether our more detailed model is hopelessly compromised by uncertain parameter values. Reassuringly, the consistency of our results shows that this is not the case (Table 4).

Explicit analysis of uncertainty can also provide useful insights to managers (Doak and Mills 1994, Pascual and Adkison 1994). One way to incorporate uncertainty into management decisions is to consider, as in our analysis, the full range of outcomes predicted by the range of uncertainly estimated input parameters (Table 4). Using the variation in outcomes of these models, LSS analysis provides an effective tool for identifying the life-history stages and subsets of the population that contribute most to variation in model forecasts. Obtaining better estimates of those specific parameters (or better understanding of the processes that affect those parameters) will most benefit the precision and accuracy of the model predictions. For example, LSS analysis identified dispersal of juvenile and subadult females at the south end of the range as the parameter contributing most to uncertainty in predictions of southward range expansion and population growth to the south of Point Conception (Figs. 5 and 6). The discrepancy between this result and the elasticity analysis results stems from the relatively large variances associated with the dispersal parameters (Table 3). These variance estimates include both process error and sampling error components, which we could, ideally, decompose. While the limitations of our data sources led us to simply leave these grouped, we believe that most of the combined variance reflects sampling uncertainty, which could be reduced by increased sample sizes. Hence, fieldwork designed to improve estimates of juvenile and subadult female dispersal in the south of the range would do most to improve accuracy and reduce uncertainty in predicting future range expansion and the associated economic implications for tourism and fisheries industries (USFWS 2005).

A second function of sensitivity analysis is the identification of key life-history stages to target for further study or management action, with the goal of having the greatest efficacy for recovery or some other explicit objective. This is a point worth emphasizing, because these results are often not intuitively obvious. For example, although males are more likely to move longer distances than females and most of the individuals that currently travel south of Point Conception are males, female dispersal and survival was far more important in determining range expansion rates and future population growth south of Point Conception. This is not so surprising considering that range expansion by males alone would provide no intrinsic population growth (i.e., reproduction) at the ends of the range. Less intuitively, while subadult female dispersal affects range expansion more than does adult female dispersal, elasticity analysis indicated that it is actually the survival of adult females that can have the greatest potential impact on both range expansion rates and population growth (Fig. 5, Table 5), underscoring our need for a better understanding of the ultimate processes affecting adult female survival (Estes et al. 2003, Gerber et al. 2004, Tinker et al. 2006).

In spite of the range of complications that it includes, our multistate matrix model does not explicitly account for some features of population ecology likely to be important for sea otters and many other species to which this approach could be applied. These include density dependence (Laidre et al. 2001), spatial and temporal variation in habitat quality (Thomas and Kunin 1999, Virgl and Messier 2000), seasonal reproductive peaks and movement patterns (Jameson 1989), and important behavioral characteristics such as age- or sex-based segregation at smaller spatial scales (Jameson 1989). The most critical of these factors, such as density dependence and habitat quality, are implicitly present in our model, since these effects have determined past and present vital rates, distributions, and movement probabilities within different regions of the existing range (Tinker et al. 2006). Nonetheless, certain features of range expansion in sea otters such as periodic or "pulse-like" advances in range edges (Riedman and Estes 1990) are not predicted by our model. These trends may be related to temporal or spatial variation in habitat quality and prey abundance (Lubina and Levin 1988): for example, the apparent "jump" that occurred around 1998 (Fig. 4B) likely corresponds to the first large-scale movement of sea otters around Point Conception, a significant biogeographic barrier (Fig. 1) that may have discouraged earlier and more gradual range expansion. Such environmental heterogeneity can be explicitly incorporated into future models through variations to our approach (e.g., Neubert et al. 2000, Weinberger 2002).

Overall, our analysis shows how movement and demography data can be integrated to provide robust analyses of population growth and spread that can better inform policy and management decisions. This same synthesis of a multistate dispersal matrix and the integro-difference equation for estimating population growth and range expansion could be applied to other wide-ranging species, providing a useful and flexible tool for conservation biologists that can be easily modified as additional data and more precise parameter estimates

become available, as they will with rapid improvements in remote-tracking technologies. Analyses that emphasize uncertainty and the effects of different aspects of individual performance for population growth and spatial spread can dramatically increase the utility of these models for conservation management. The approach provides both guidance for the acquisition of these data and a means of forecasting the consequence of specific management actions. Our results demonstrate that this powerful analytical tool, which has been increasingly used in the study of invasive species, can also aid in the management of threatened but recovering wildlife populations as they recolonize former habitat.

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Appendix G: Response to Comments

Appendix G: Response to Comments

This appendix contains USFWS's responses to substantive comments we received on the 2011 revised draft SEIS. We announced the availability of the revised draft SEIS and a proposed rule to implement the preferred alternative on August 26, 2011 (76 FR 53381). The comment period was originally scheduled to end on October 24, 2011 (76 FR 53381). On November 4, 2011, we announced a reopening of the comment period until November 21, 2011 (76 FR 68393), based on a request for a 45-day extension by the California Sea Urchin Commission. Court settlement deadlines prevented us from granting the full 45-day extension; however, the reopened comment period allowed us to accept public comments for 18 additional days. We accepted oral and written testimony during public hearings held in Ventura, California on September 27, 2011, Santa Barbara, California, on October 4, 2011, and Santa Cruz, California, on October 6, 2011. Approximately 190 people attended the public hearings, and 68 provided testimony. During the 78-day comment period, we received 6,843 comment letters, postcards, and emails from interested individuals and organizations. Among the comment letters were 5 petitions with 12,514 signatories. We have reviewed all the comments we received.

Our assessment of impacts in this final SEIS has been revised based on substantive information submitted. Where we did not make changes in response to a substantive comment, we explain our reasoning in our response. Electronic copies of all comments submitted during the comment period may be obtained from the Ventura Fish and Wildlife Office, 2493 Portola Road, Suite B, Ventura, California 93003.

We have summarized the comments according to the content of the statements made in letters, emails, and oral and written testimony submitted during public hearings. These comments are included in the list of substantive comments and responses presented in this appendix. Many commenters submitted comments that were similar enough that they could be addressed by one response. We made numerous changes in the final SEIS in response to the public comments. Where we made changes in response to a substantive comment, we identify the relevant sections of the revised document. Numerous technical and editorial comments were also taken under consideration, and changes to the final SEIS were made as appropriate. Electronic copies of all comments submitted during the comment period may be obtained from the Ventura Fish and Wildlife Office, 2493 Portola Road, Suite B, Ventura, California 93003.

The comments and responses are given in Table G-1 (p. 2). Some commenters addressed many points. In these cases, there are multiple responses from USFWS. The remaining three tables identify each commenter and the USFWS response associated with the submitted comment. The tables include all commenters who made substantive comments but do not include all commenters who expressed support for an alternative (but did not include any additional substantive information) by means of a form email or pre-printed postcard. Table G-2 (p. 83) lists commenters representing organizations/agencies and elected officials who submitted comments electronically or by mail. Table G-3 (p. 84) lists interested individuals who submitted comments electronically or by mail. Table G-4 (p. 88) lists commenters representing organizations/agencies, elected officials, and interested individuals who submitted comments during public testimony. The numbers given in the right column of these tables correspond with the appropriate comment and response.

TABLE G-1. COMMENTS RECEIVED ON 2011 REVISED DRAFT SEIS AND RESPONSES

No.	Comment Summary	Response
	Positions on Alternatives	
1	Approximately 750 commenters and 12,500 signatories to petitions expressed support for the proposed action (Alternative 3C) for one or more of the following reasons: range expansion is important for sea otter recovery; sea otters are a native, keystone species in kelp forest habitats; the presence of sea otters would enhance biodiversity in southern California waters; the presence of sea otters would enhance the economy by producing benefits for tourism and industries that depend on ocean health; sea otters have an intrinsic right to recolonize and make use of their historic habitat, the nearshore marine environment, without human-imposed restrictions.	Thank you for your comments. They have been noted and will be included in the administrative record for this action.
2	Approximately 6,000 commenters did not specifically identify an alternative but expressed support for terminating the translocation program and ending the "no-otter" zone for one or more of the following reasons: range expansion is important for sea otter recovery; sea otters are a native, keystone species in kelp forest habitats; the presence of sea otters would enhance biodiversity in southern California waters; the presence of sea otters would enhance the economy by producing benefits for tourism and industries that depend on ocean health; sea otters have an intrinsic right to recolonize and make use of their historic habitat, the nearshore marine environment, without human-imposed restrictions.	Thank you for your comments. They have been noted and will be included in the administrative record for this action.
3	Implementing the No Action Alternative is the best way to allow sea otters to expand their range into southern California while still maintaining the incidental take exemptions provided in Public Law 99-625 for the fisheries.	The No Action Alternative does not appear to be a viable alternative. While the environmental consequences of the No Action Alternative are the same as baseline environmental conditions and as such form an integral part of our analysis, the legal regime reflected in the No Action Alternative (continuation of the translocation program without containment) is not a reasonable path forward. In the RDSEIS/FSEIS we consider the following additional alternatives: resume implementation of the translocation program (Alternative 1), modify it (Alternative 2), or terminate it (Alternatives 3A-3C). In 2001 we published a Notice of Policy (66 FR 6649; January 22, 2001) notifying the public that we would not implement the containment component of the translocation program pending completion of a supplemental environmental impact statement and a final evaluation of the program. In the notice we acknowledged the conclusion of our 2000 biological

		opinion that capture and removal (containment) of southern sea otters from the management zone—a key component of the translocation program—would likely jeopardize the continued existence and impede the recovery of the species. In light of our inability to implement the translocation program as designed and intended, we committed to a full and final evaluation of the program. We have also faced litigation over the translocation program twice during the past twelve years: first, for failing to implement the containment component of the translocation program, and second, for failing to complete our evaluation of whether the translocation program has failed. In resolution of the second lawsuit, we committed to evaluating whether the translocation program has failed under 50 CFR 17.84(d)(8), and if we determined the program has failed, to promulgate a final rulemaking to terminate the program. Continuing to maintain the status quo, which is reflected in the No Action Alternative, when we cannot implement the translocation program as intended by Congress in P.L. 99-625 and have concluded in our evaluation of the translocation program that the program has failed and does not further recovery of the southern sea otter, is not reasonable and cannot be justified on the basis that it would maintain current incidental take exemptions for fisheries. We have now prepared a FSEIS and completed a final evaluation of the translocation program. We will render our final decision in our Record of Decision and Final Rule.
4	The difference between the No Action Alternative and the proposed action, Alternative 3C, is minor and is not supported by adequate comparative analysis and science, even though the No Action Alternative is a valid option. As such, a decision to follow Alternative 3C over the No Action Alternative, or some combination of the two, is arbitrary and capricious.	The environmental consequences of the No Action Alternative (status quo) and Alternative 3C (the preferred alternative) are identical except with respect to changes in the regulatory status of sea otters in southern California that would occur under Alternative 3C. Under Alternative 3C, the exemptions from the take prohibitions of the ESA and/or MMPA that currently exist in the management zone and translocation zone would end. We describe the effects of these changes in detail in Chapter 6 of the RDSEIS/FSEIS. The No Action Alternative does not appear to bea viable alternative. It would continue the translocation program, even though the program has failed to meet its primary recovery objective, and even though a primary component of the program—maintenance of an otter-free zone—cannot be legally implemented. It would also legally restrict, though without an ability to enforce that

		restriction, the natural movement of southern sea otters southward from central California into their historic range in the Southern California Bight, in contravention of the recovery needs of the species. Alternative 3C, on the other hand, would terminate the translocation program while leaving in place the San Nicolas Island population of southern sea otters and any otters in the management zone. It would contribute to the recovery of southern sea otters by allowing for natural range expansion and continuation of the San Nicolas Island population free of the artificial boundaries and legal strictures imposed pursuant to Public Law 99-625.
5	Alternative 2 is not acceptable. It includes offshore Island locations that will jeopardize existing fisheries and the Abalone Recovery Management Plan while simultaneously limiting coastal expansion of sea otter to their current range. This is a lose/lose situation.	Thank you for your comment. It has been noted and will be included in the administrative record for this action.
5.5	An alternative needs to be added that still allows the protections to the commercial fishing industry.	Alternative 1 would require resumption of the translocation program with the existing management zone boundaries, whereas Alternative 2 would require resumption of zonal management, but with a modified management zone. These alternatives would offer protections to the commercial fishing industry.
6	An alternative needs to be added that will allow for the co-existence of fishermen and sea otters. It is possible to take the concept of a modified translocation program and smaller management zone and make it more realistic and effective by taking into account what has been learned from the current translocation. Alternative 2 can be modified to be less damaging to the existing fisheries and endangered and depleted abalone in Southern California by taking a broader view than mere range expansion of sea otters as the sole strategy for sea otter population recovery and protection. Therefore, as a second choice, the Sea Urchin Commission recommends its own Alternative 2B. Alternative 2B would modify the current management zone by excluding from that zone the area from Point Conception to Oxnard along the coast to a distance of three miles offshore. This excludes the parent population that has already expanded south of Point Conception from the management zone and allows the parent population to further expand its range. This modified management zone also reflects the dispersal patterns predicted in Tinker *et al.* (2008). Tinker's model indicates a predictive range expansion wave	Thank you for your comment. The potential effects of the proposed Alternative 2B are substantially similar to those of alternatives already analyzed in the document. Therefore, a separate analysis is not necessary. Like Alternative 1, the proposed Alternative 2B would require enforcement of a management zone in perpetuity, prevent any future sea otter range expansion to the Channel Islands, and retain the translocated sea otter colony at San Nicolas Island. Like Alternative 2, the proposed Alternative 2B would allow limited range expansion along the mainland coastline in southern California and retain the translocated sea otter colony at San Nicolas Island. Whereas Alternative 2 truncates this mainland range expansion at Santa Barbara, the proposed Alternative 2B truncates this mainland range expansion slightly further (35 mi or 56 km) east, at Oxnard. The impacts of mainland range expansion to Oxnard are evaluated under the No Action Alternative and Alternatives 3B and 3C. Although the proposed Alternative 2B is not similar to Alternative 3C, in that Alternative 3C terminates the translocation program and allows for unimpeded natural range expansion while allowing sea otters to remain at San Nicolas Island, the effects would be substantially similar to those presented for

	speed of 5.2 km/year southward along the coast such that within 25 years the parent population south of Point Conception will grow to approximately 395 individuals and will expand in range as far south as Oxnard. This range expansion model does not anticipate large numbers of parent population animals expanding into the modified management zone. If the model is correct, as assumed by the Service, then only occasional small numbers of animals will need to be removed from the revised management zone. Under this alternative, the current sea otter population at San Nicolas Island would be deemed to be native born to the Island and would remain there. Because of the sea otter's territorial nature and the numbers currently at the Island, which are surrounded by abundant food resources, it is unlikely the San Nicolas Island sea otters will disperse into the revised management zone within a 25-year time frame. Adoption of this alternative would maintain the sea otter's experimental population status within the modified management zone. Thus, the exemptions from prohibitions on the incidental take of sea otters in the modified management zone pursuant to otherwise lawful activities would be permitted. This alternative is fully consistent with the ecosystem management approach long advocated by the Service in that it not only protects and conserves the sea otter but it also protects and conserves other species with significant roles in the ecosystem. These species include endangered and depleted abalone and other shellfish species subject to sea otter predation. The alternative accomplishes these purposes without totally destroying California's shellfish fisheries. Furthermore, this alternative is fully consistent with the President's national ocean policy that calls for marine spatial planning as a mechanism of ecosystem management. Indeed, this alternative could be a model for such a planning program. Implementing this model will also allow the Service to undertake a variety of research programs and to develop new and improved ecosystem management techniques. Among these are: 1) addressing water quality issues that are the principal cause of sea otter strandings and deaths and the "main reason" for population growth problems in the parent population (DSEIS at 49); 2) realistically determining the size of a sustainable sea otter population based on the current status of the sea otter's habitat and food resources; and 3) developing ways to improve prey recruitment and growth in areas occupied by sea otters. Simultaneously, the Service would consider	Alternative 3C within 10 years because sea otters are expected to expand their range only to Carpinteria (lower bound) or Oxnard (upper bound) within this period. We note that the "marine spatial plan" proposed by the commenter, which "would create a protected area for black abalone and other shellfish resources around all of the Channel Islands except SNI" is identical to the resumption of zonal management of sea otters evaluated under Alternative 1. We evaluate the effects of two different management zone configurations on black abalone, white abalone, and shellfish fisheries under Alternative 1 and Alternative 2 in the RDSEIS/FSEIS. The commenter states that "implementing this model will also allow the Service to undertake a variety of research programs and to develop new and improved ecosystem management techniques," including addressing water quality issues, determining carrying capacity and/or OSP ("sustainable population size"), developing means of improving prey recruitment and growth, recruiting and training vessels for oil spill response, developing improved sea otter capture and transfer techniques, and developing a culling program." We note that the "programs and techniques" that the commenter states would be available to us under the proposed Alternative 2B are equally available to us (if we deemed them to be otherwise appropriate, desirable, and legal) under one or more of the other alternatives fully evaluated in the RDSEIS/FSEIS. We note further that the "programs and techniques" listed as potential benefits of adopting the proposed Alternative 2B are beyond the scope of this RDSEIS/FSEIS, the purpose and need of which is to complete one high-priority recovery action identified in the Final Revised Recovery Plan for the Southern Sea Otter (USFWS 2003) (Task 5: Evaluate the translocation program in light of changed circumstances and determine whether one or more failure criteria have been met). The Council on Environmental Quality (CEQ) regulations require, once the purpose and need have been identified, that an agency "[r]igorously explore and objectively evaluate all reasonable alternatives, and for alternatives which were eliminated from detailed study, briefly discuss the reasons for their having been eliminated" (40 CFR 1502.14). The term "reasonable alternatives" refers to alternatives "that are technically and

	appropriate sea otter management and protection techniques that include: 1. recruiting and training "vessels of opportunity" that can be rapidly deployed in response to an oil spill; 2. developing improved sea otter capture and transfer techniques that can be applied within the modified Management Zone and elsewhere in the country to further this program, as well as other spatial planning initiatives; and 3. developing and implementing an appropriate culling program if carrying capacity is reached for stranded males, males found within the modified management zone, or non-territorial males in poor condition along the southern front of sea otters. Although the Sea Urchin Commission recognizes Alternative 1 is by far the best choice with respect to an ecosystem approach that protects and conserves endangered abalone and other important shellfish resources, the Sea Urchin Commission understands that this ecosystem management approach is not favored by some. Therefore, in the spirit of compromise, the Sea Urchin Commission recommends consideration of Alternative 2B discussed above. The alternative recommended by the Sea Urchin Commission proposes a marine spatial plan that would create a protected area for black abalone and other shellfish resources around all of the Channel Islands except SNI. This is significant for black abalone survival and recovery as the Channel Islands black abalone critical habitat areas are rated as "high" value sites. In contrast, all coastal critical habitat designations are considered to have only a low or medium value. Maintaining an abalone and shellfish protected area around the Channel Islands, except SNI, will diminish the threat of sea otter predation on the natural and man-assisted black abalone populations in the southern half of the newly designated black abalone critical habitat. The Commission also notes that leaving sea otters at SNI will help the Service to conduct comparative analyses of habitat conditions and capacity that could enable the Service to maintain SNI sea otters within the carrying capacity of that area.	economically practical or feasible and meet the purpose and need of the proposed action" (43 CFR 46.420(b)). An agency need not give detailed consideration to alternatives similar to alternatives actually considered (or with environmental consequences that are similar), or alternatives that are infeasible, ineffective, or inconsistent with the basic policy objectives for the management of the area or the purpose and need of the action (*Vt. Yankee Nuclear Power Corp. v. Natural Res. Def. Council*, 435 U.S. 519, 551 [1978]; see also *Westlands Water Dist. v. U.S. Dep't of Interior*, 376 F.3d 853, 868 [9th Cir. 2004][agency not required to separately analyze alternatives with substantially similar consequences]; *City of CarmelByTheSea v. U.S. Dept. of Transp.,* 123 F.3d 1142, 1159 [9th Cir 1997][agency not required to evaluate alternative submitted during comment period and characterized as environmentally superior where the alternative would not meet project purposes or were similar to alternatives already analyzed]).
6.5	People say you cannot draw a line in the ocean, but we have shipping lane lines in the ocean, we have marine protected areas that draw lines in the ocean, and now there is a big push for spatial planning. This management zone is just a little bit ahead of its time; it can be used in a similar way. It can be an area where the food supply of sea otters is	In the absence of more specific information, we interpret this comment as a statement in favor of Alternative 1. Thank you for your comment. It has been noted and will be included in the administrative record for this action.

	replenished and transported to other areas.	
7	EPA reviewed the 2005 DSEIS (comment letter dated March 6, 2006) and stated our support for the preferred Alternative 3C, which is to terminate the translocation program, allow sea otters existing in the former translocation and management zones to remain there, and to allow for the natural range expansion of sea otters in the future. This represents the Service's shift in recovery strategy from translocation to natural range expansion due to the observed degree of sea otter dispersal and mortality from translocation. Based on our review of the RDSEIS, we continue to support Alternative 3C and have rated it as Lack of Objections (LO) (see enclosed "Summary of Rating Definitions").	Thank you for your comment. It has been noted and will be included in the administrative record for this action.
8	The Department agrees that the translocation program has had limited success in achieving its primary recovery goal, the establishment of a sea otter population that could serve as a source for future translocations. However, the population at San Nicolas appears to be stable and is growing. The Department believes that at this time, recovery of the southern sea otter might best be achieved by allowing continued natural range expansion and allowing existing otters to remain in the translocation and management zones. Additionally, we wish to point out that presently there is nothing preventing sea otters from expanding into the management zone. Sea otters have permanently occupied habitat inside the management zone for a number of years.	The preferred alternative, Alternative 3C, would allow for continued natural range expansion and would not require the removal of sea otters from the management zone or the translocation zone at the time the decision to terminate the program was made. We acknowledge throughout the RDSEIS that we have not moved sea otters out of the management zone since 1993 and that nothing is currently preventing sea otters from expanding their range naturally into the Southern California Bight. Our analysis under Alternative 1 (Resume Implementation of the 1987 Translocation Plan) accounts for effects that the sea otters present in the management zone have had since seasonal movements into the zone began in the late 1990s.
Expansion and Health of the Southern Sea Otter Population		
9	The proposed action does not address the real problem for southern sea otter recovery, disease resulting from degraded water quality. Freshwater runoff into sea otter habitat is fed by dozens of impaired waterways. Controlling pollution-caused mortality could result in the recovery and delisting of the sea otter. Yet, the analysis of alternatives contained in the RDSEIS is devoid of any consideration of ways to address pollution-caused mortality. The failure to identify and analyze such an alternative is a fundamental and fatal flaw in the adequacy of the RDSEIS. The Service has the authority under the ESA to compel actions to protect the sea otter. Yet, the Service has completely ignored, and refused to analyze, any water quality alternative. Since disease is confirmed to have a deleterious impact on sea otters, we feel that examining the full suite of possible actions to mitigate for disease, prevent its spread, or develop treatments is a critical component in working	Addressing disease is one component of the overall recovery strategy for southern sea otters. That strategy is outlined in the Final Revised Recovery Plan for the Southern Sea Otter (USFWS 2003). The purpose and need of the RDSEIS/FSEIS is not to evaluate all recovery actions for southern sea otters, but rather to complete one high-priority recovery action identified in the plan (Task 5: Evaluate the translocation program in light of changed circumstances and determine whether one or more failure criteria have been met). Proposing and evaluating strategies to limit non-point-source pollution and to improve water quality is thus beyond the scope of this RDSEIS/FSEIS. The translocation program was not intended or designed to address every action necessary to recover the southern sea otter. The objectives of southern sea otter translocation, as stated in the 1982 recovery plan, included: (1) Establishing a

	toward the overall goal of recovery, and deserve full vetting in this document as possible action alternatives.	second colony (or colonies) sufficiently distant from the parent population such that a smaller portion of the southern sea otter range would be affected in the event of a large-scale oil spill; and (2) establishing a database for identifying the optimal sustainable population level for the southern sea otter. Our translocation program evaluation concludes that the translocation program has failed under one of the specific failure criteria set forth in 50 CFR 17.84(d)(8) and has also failed to achieve its overall recovery objectives. Maintaining an otter-free zone as provided in the translocation plan would prevent the natural range expansion of southern sea otters; that is, it would preclude the natural repopulation of southern California waters by southern sea otters and is detrimental to southern sea otter recovery. Additionally, it would make it difficult, if not impossible, to reach the Optimum Sustainable Population level for sea otters in California, as we are mandated to do under the MMPA. We recognize the importance of addressing disease in southern sea otters, but that issue is beyond the scope and specific objectives of the translocation program and is not relevant to our determination that the translocation has failed to achieve its primary recovery goal of producing a second, self-sustaining population of sea otters that could produce sufficient numbers of sea otters to repopulate the mainland range in the event of catastrophic mortality and has failed under the specific regulatory criteria established to evaluate the program. Further, the commenter is incorrect in assuming that solely addressing water quality issues is sufficient to bring about the recovery and delisting of the southern sea otter. The occurrence of infectious disease in sea otters resulting from land-borne pathogens appears to be related synergistically to exposure to harmful algal blooms and to nutritional stress (food limitation). These factors often interact in complex ways that we are just beginning to understand. For example, lower per-capita food availability leads to poorer body condition and greater reliance on sub-optimal prey, which increases exposure and susceptibility to novel disease-causing pathogens, which may be further exacerbated by chronic domoic acid exposure) (Tinker, pers. comm. 2012). We are continuing to support research to understand these complex processes in order to identify management actions that target areas with the maximum growth potential for sea otters and thus the maximum

		effect on recovery. None of the alternatives under consideration in any way precludes continued efforts to understand and address disease in sea otters. In fact, because food limitation increases exposure and susceptibility to disease, the movement of sea otters into areas with higher prey abundance, such as would continue to occur under Alternatives 3A-3C, would likely result in a lower incidence of disease in those sea otters.
10	The Service should address the problem of *Toxoplasma gondii* from cat feces.	The pathways by which sea otters are becoming exposed to *Toxoplasma gondii* are more complex than were at first recognized. Until recently, it was believed that cats (both domesticated and wild) were the only definitive host for this protozoal parasite. However, the widespread exposure of other marine mammals to *T. gondii*, including those whose habitat is mostly pelagic and distant from human population centers, as well as recent laboratory analyses, have suggested that there may be a definitive host in the marine environment (*e.g.*, Jensen *et al.* 2010). If sea otters are being exposed by this route, then efforts to control cat feces will have no effect on *T. gondii* exposure in sea otters. The relative contribution of parasites from wild felids versus domestic or feral cats is also an outstanding question (one that is currently under investigation, *e.g.,* Miller *et al.* 2008); efforts to control domestic cat feces will have no effect on sea otter exposure to *T. gondii* parasites from wild felids. Finally, recent research indicates that *T. gondii* is only one of a number of closely related protozoan parasites that infect sea otters (*Sarcocystus neurona* is another), and genetic work has revealed that in many cases sea otters and other marine mammals actually have co-infections of multiple parasite species (*e.g.,* Gibson *et al.* 2011, Colegrove *et al.* 2011). A better understanding of the sources of the various parasite genotypes, the routes by which they are entering marine food webs, and the degree to which they have significant health impacts on sea otters is needed before specific management actions can be recommended. We are continuing to support research to understand the pathways by which sea otters are being exposed to *Toxoplasma gondii* and other parasites and the effects of these parasites on recovery.
11	The issues regarding the sea otter translocation program are not about striking a balance between economics and environmentalism, but about doing what is right. Hijacking a program intended to nurse the sea otter population back to healthy abundance	Thank you for your comment. It has been noted and will be included in the administrative record for this action.

	in order to preserve declining industries, at the expense of those very populations, is not right.	
12	The southern sea otter population needs to expand into southern California beyond Point Conception if this species is ever to recover its original range. Sea otters are also an important functional element of the coastal marine ecosystem in that region (Estes *et al.,* 2011). Preventing their recovery by any means would be contrary to the conservation and management goals of the Service under the both the ESA and the MMPA.	We agree. Our proposed action, Alternative 3C, allows for the continued natural range expansion of sea otters into their historic range in southern California waters. This alternative reflects the recommendation made in the revised recovery plan, which advises against additional translocations and instead advocates allowing natural range expansion (USFWS 2003).
13	The Service's analysis of the nature and extent of range expansion relative to important fishery areas is fundamentally flawed. From 1938 to 1977 the average range extension was 2.5 miles a year. However when sea otters encounter less than optimal habitat such as sandy beach areas, coastal migrations of 18 miles per year have been observed (Woodhouse *et al.* 1977). Coastal community structure south of Point Conception is frequented by sand and low relief communities. In other words, it is very likely that sea otter range expansion will move more rapidly through these coastal areas and will quickly reach important fishing grounds.	The range expansion model (Tinker *et al.* 2008) used in our analysis is described in section 6.1.4.1 of the RDSEIS/FSEIS. That model is based in part on past rates of range expansion, which has occurred in areas with rocky, sandy, and mixed substrates. Although the model is several years old, range expansion thus far has fallen within the confidence bounds of the published predictions. As we explain in the RDSEIS/FSEIS, we use an updated set of predictions generated by the model based on recent range boundary and abundance data. We present range expansion as a range with a low bound (Carpinteria) and a high bound (Oxnard) to reflect the uncertainty in these predictions. The information presented in the RDSEIS/FEIS represents the best available scientific information on range expansion. The commenter does not provide any data to contradict this analysis.
14	Although the Service first determined that southern sea otters would be considered for delisting when the population level reached a three-year running average of 2,650, that number was later revised, without explanation, to 3,090. Sea Otter Recovery Plan at 29.	The 2003 Final Revised Recovery Plan for the Southern Sea Otter gives recovery criteria for the southern sea otter and states that the subspecies will be considered for delisting under the Endangered Species Act when the average population level over a 3-year period exceeds 3,090 animals (USFWS 2003). The latest available 3-year running average (which includes the 2010 spring count) is 2,711 animals (http://www.werc.usgs.gov/seaottercount). The rationale for the revised delisting criterion is explained on page 26 of the recovery plan (USFWS 2003).
15	P.15 With oil spill risk being one of the key factors behind the establishment of an independent San Nicolas population in the first place, and given the presence of offshore oil platforms in the expanded sea otter range alternatives, it seems arbitrary to not further analyze the impact of oil spill risk as part of the RDSEIS. There would seem to be a wealth of information and reports pertaining to the Exxon Valdez and Gulf Oil spills that could possibly assist in quantifying oil spill risks under the proposed	Appendix B to the revised recovery plan for the southern sea otter (USFWS 2003) is entitled "Potential Impacts of Oil Spills on the Southern Sea Otter Population" and simulates numerous oil spill scenarios. The recovery plan is incorporated by reference in the RDSEIS/FSEIS. The scenarios modeled in Appendix B inform the conclusion in the recovery plan that the translocated San Nicolas Island colony could not provide a reasonable safeguard against an oil spill of the magnitude of the

	alternatives.	*Exxon Valdez,* and that an alternate recovery strategy (allowing natural range expansion) should be adopted. Although the Deepwater Horizon oil spill has increased our awareness of the potential magnitude of oil spills, the inclusion of this information would not alter, but merely reinforce, the conclusion that the San Nicolas Island colony is not sufficiently removed to provide a reasonable safeguard against an oil spill. We do not believe that a detailed analysis of oil spill risk under each of the alternatives is necessary to inform our decisionmaking. However, we have included a discussion of oil spill risk in our evaluation of potential hazards to which sea otters in southern California waters may be exposed. See sections 6.2.3.3, 6.3.3.3, 6.4.3.3, 6.5.3.3, 6.6.3.3, and 6.7.3.3 of the FSEIS.
16	Given the acknowledgement that infectious disease is a primary cause of death for sea otters and that one of the primary vectors for disease transmission is likely domesticated pets (e.g., cats), the RDSEIS seems deficient in describing the potential for increased mortality in the expanded range alternatives. With the nearshore coastal waters of the Southern California Bight lying adjacent to large metropolitan population centers, the increased probability of disease transmission would seem to be worthy of description and analysis. This logic holds true as well for the increased toxin and pollutant loads that sea otters would face in occupying expanded habitat in the SCB. A thorough description and analysis of the potential infectious diseases and nearshore pollutants and toxins should be included in the RDSEIS.	We have added text to sections 4.3.3.3, 6.2.3.3, 6.3.3.3, 6.4.3.3, 6.5.3.3, 6.6.3.3, and 6.7.3.3 to address potential effects of the alternatives on exposure to mortality risk factors, including disease caused by protozoal pathogens. We state in section 4.3.3.3 of the RDSEIS/FSEIS that the degree of exposure to chemical contaminants, such as polychlorinated biphenyls (PCBs), may play a role in driving patterns of disease mortality (Kannan *et al.* 2006, 2007). However, as Kannan *et al.* (2007) acknowledge, further research is needed to establish the association between contaminant levels and immunosuppression. We do not believe this association is sufficiently well understood to warrant a discussion of potential contaminant exposures in the Southern California Bight and the potential for increased disease-related mortality under each of the alternatives.
17	There should be an independent audit of the southern sea otter survey and its methods. I read an article recently with Tim Tinker talking about 306 strandings in 2010. Now, you said that was 40 percent of the mortality. So that means that 100 percent mortality was about 760 animals. That's 20 or 25 percent of the population. So he's saying, the way I read it, that 20-25 percent of the population dies every year and then somehow is replenished because it seems every year you got the same number, 2,700-3,000 animals in your population survey.	Population trends are a function of births, deaths, immigration, and emigration. Immigration and emigration are not believed to be significant influences on the size of the southern sea otter mainland population. The spring survey, which is the official count of the mainland southern sea otter population, follows a standardized method that was developed by USGS scientists and implemented beginning in 1982. It is a cooperative effort of USGS, CDFG, the Service, the Monterey Bay Aquarium, the University of California, Santa Cruz, other organizations, and experienced volunteers. These data represent minimum population counts, with no associated correction factor or variance estimate. As a result, they include significant (but unquantifiable) observation error, caused mostly by year-to-year variance in survey conditions. To

		reduce the potential influence of error in any single census, data are presented as 3-year running averages. The 3-year running average is the metric the southern sea otter recovery plan (USFWS 2003) recommends using to reduce the influence of anomalously high or low counts from any particular year. An explanation of the sea otter stranding data and their relationship to the spring count may be found at http://www.werc.usgs.gov/seaottercount.
18	Attached is a sampling of the many scientific studies and articles which document the enormous amount of oil flowing daily into the waters south of Point Conception. Contrary to protecting this species, this proposed action would instead expose the species not only to natural oil on the water but to other natural and man-made hazards as well. There are more than 1,000 recorded natural oil seeps which flow daily into the very same waters which are in the immediate path of the otters' southward migration. These hazards are well known and scientifically unchallengeable. Rather than "opening the door" further into these waters, if the Service's objective is to protect this species, a more logical action is to close this door, to examine why the capture-and-relocate has not been pursued in good faith and to reinstate this effort. For the otters' own protection, zonal management needs to be implemented and enforced.	We discuss the potential effects of natural oil seeps on sea otters under each of the alternatives in in sections 6.2.3.3, 6.3.3.3, 6.4.3.3, 6.5.3.3, 6.6.3.3, and 6.7.3.3.
19	It is incumbent on the Service to reassess the carrying capacity of existing and potential sea otter habitat in southern California. The increasing number of sea otter strandings that are occurring, even as sea otters have expanded their range since 1993, raises serious questions about the carrying capacity of the habitat. Unless and until the issue of water quality and other habitat limiting factors are addressed, it is quite likely that the net result of the Service's preferred alternative will be approximately the same number of sea otters simply spread over a larger geographic area.	Section 6.2.11.1 of the RDSEIS/FSEIS identifies an estimate of carrying capacity for California of approximately 16,000, which is based on an analysis by Laidre *et al.* (2001), and explains how that estimate was derived. Although sea otter numbers are far below this threshold (the latest available 3-year running average is 2,711), the commenter is correct that sea otters appear to be food limited (at carrying capacity) in portions of the central California range (Bentall 2005, Tinker *et al.* 2008b). Range expansion into areas with lower sea otter densities and higher per-capita prey availability will likely result in population increases rather than the distribution of the same number of sea otters over a larger area. See also our response to comment 9.
20	It is incumbent on the Service to reassess the carrying capacity of existing and potential sea otter habitat in southern California. The increasing number of sea otter strandings that are occurring, even as sea otters have expanded their range since 1993, raises serious questions about the carrying capacity of the habitat. Unless and until the issue of water quality and other habitat limiting factors are addressed, it is quite likely that the net result of the	Section 6.2.11.1 of the RDSEIS/FSEIS identifies an estimate of carrying capacity for California of approximately 16,000, which is based on an analysis by Laidre *et al.* (2001), and explains how that estimate was derived. Although sea otter numbers are far below this threshold (the latest available 3-year running average is 2,711), the commenter is correct that sea otters appear to be food limited (at carrying capacity) in portions of the central

	Service's preferred alternative will be approximately the same number of sea otters simply spread over a larger geographic area.	California range (Bentall 2005, Tinker *et al.* 2008b). Range expansion into areas with lower sea otter densities and higher per-capita prey availability will likely result in population increases rather than the distribution of the same number of sea otters over a larger area. See also our response to comment 9.
21	A recent population viability analysis (PVA) conducted by Dr. Daniel Doak demonstrates that increases in the southern sea otter population and the probability of meeting the Service's recovery goals for the species substantially differ depending on whether zonal management is terminated and sea otters are allowed to remain at San Nicolas Island. The likelihood of recovery, resulting in the delisting of the southern sea otter, and even the likelihood of uplisting the otter to endangered status will be significantly influenced depending on whether the management zone is maintained or abandoned. Termination of zonal management and removal of the exclusion zone will result in a 14 percent increase in the probability of the southern sea otter meeting the recovery criteria at the end of the 10-year period adopted by the Service. This outcome translates into a greater than 55 percent proportional reduction in risk that in 10 years the population will not have met the Service's recovery goal. Lesser differentials in the probability of recovery have been considered unacceptable for other listed species. These results support the conclusion that continuing the containment program would hinder recovery and violate the conservation mandate. Clearly, the Service cannot meet its affirmative duty to achieve recovery when it is carrying out an action that makes species conservation and delisting significantly less likely. The Service's conclusions, supported by this most recent analysis, make clear that continuation of the containment program would violate the Service's section 7(a)(1) obligations. The program must be declared a failure and ended. In addition, when the PVA takes into account the well-documented but poorly understood periodic dips in the southern sea otter population, it shows that maintenance of the containment zone does result in 4.4 to 5.6 percent risk of the southern sea otter population dipping below the threshold for uplisting it to endangered status under the ESA. While these risks are not significant in and of themselves, they do highlight the non-trivial risk that uplisting could take place, despite current growth trends.	We have incorporated the results of the referenced population viability analysis (Doak 2011) into our discussion in sections and 6.2.3.3, 6.2.11.1, 6.3.3.3, and 6.3.11.1 of the FSEIS.

	Finally, as Doak demonstrates, the number of otters that would have to be captured and moved to maintain the management zone program is very large, resulting in unacceptably high sea otter mortality and requiring the Service to spend significant funds to enforce the "no-otter zone." An average of at least 45 otters would have to be pursued, captured, and translocated each year, in perpetuity. Over the next ten years, a total of 393 otters would have to be removed from the management zone. Using the Service's expected mortality rate of 17 percent, an expected 66-67 otters would die as a direct result of the containment program.	
22	In the Revised DSEIS the Service explained that it did not address climate change, water quality, oil spill risk and mitigation measures "because they are beyond the scope of the document or our ability to effect change." While CDFG acknowledges that these large-scale potential threats are often difficult to assess quantitatively, and it is more difficult yet to draw clear cause-and-effect relationships between these stressors and the status of the southern sea otter population off California, CDFG encourages the Service to consider information on these potential sources of harm and any mitigation measures in the final decision. There is an ever growing body of scientific literature dedicated to examining potential impacts of these stressors and their role in the California Current ecosystem utilizing the newest in predictive modeling capabilities that continue to improve. These considerations are critical to the context, and will provide a better basis for which to consider the specific action of discontinuing the translocation program.	We have added text to sections 4.3.3.3, 6.2.3.3, 6.3.3.3, 6.4.3.3, 6.5.3.3, 6.6.3.3, and 6.7.3.3 to address potential effects of the alternatives on mortality risk factors for sea otters, including disease and oil spills. Whereas addressing disease and oil spill risk are components of the overall recovery strategy for southern sea otters, which is outlined in the Final Revised Recovery Plan for the Southern Sea Otter (USFWS 2003), the purpose and need of the RDSEIS/FSEIS is not to evaluate all recovery actions for southern sea otters, but rather to complete one high-priority recovery action identified in the plan (Task 5: Evaluate the translocation program in light of changed circumstances and determine whether one or more failure criteria have been met). Proposing and evaluating strategies to mitigate stressors to the sea otter population off California is thus beyond the scope of this RDSEIS/FSEIS.
	Impacts on Other Species and the Ecosystem	
23	Prior to the advent of commercial offshore oil production, natural oil seeps affected sea otters such that they had little if any historic presence on the coast between Point Conception and Rincon Point. These natural oil seeps created a refuge for the benthic invertebrate prey species of sea otters in this area. The proposed action would allow the introduction of a non-native sea otter population to this area now that the protective oil slick has been destroyed by the oil industry, affecting Santa Barbara County fisheries for the first time in history. This significant fact was not addressed adequately in the RDSEIS.	We do not dispute the possibility that commercial oil extraction may have had some effect on the natural oil seeps along the mainland California coastline between Point Conception and Rincon Point. However, it is clearly not the case that sea otters are "non-native" to, or were historically absent from, the specific area to which the commenter refers. Hunting records indicate that even after half a century of fur trade exploitation, sea otters were still found in this area of the mainland coastline. As Ogden (1941) reports, for example, George Nidever's short trip with a small hunting party between Santa Barbara and Point Conception in 1835 yielded 21 sea otter skins. Archaeological evidence also suggests that sea otters were present

		along this section of the coastline. The middens at Tecolote Canyon (just west of Santa Barbara and approximately midway between Point Conception and Rincon Point) contain "thousands of burned and broken mammal bones" and indicate that "[s]ea mammals, including the now locally extinct Guadalupe fur seal and California sea otter, were important resources" (Erlandson *et al.* 2008). We discuss the effects of natural oil seeps on sea otters in section 6.2.3.3 of the RDSEIS/FSEIS. The effects of natural oil seeps on sea otters are not well understood, but in general, the risk of oiling from natural seeps is expected to be considerably less than that from anthropogenic oil spills. Whereas seeps may cause chronic, low-level stress to marine organisms, they differ in effect from anthropogenic oil spills because of the rate at which oil enters the environment. Seeps release oil slowly enough that natural processes that disperse and degrade the oil can occur, whereas spills release large volumes of oil in a short time, overwhelming these natural mechanisms (County of Santa Barbara Energy Division 2002). The presence of a group of sea otters near the seeps at Coal Oil Point for extended periods during 2007 and 2008 resulted in no known oil-related strandings. Under the proposed action, sea otters will likely affect Santa Barbara County fisheries for the first time in history, as the commenter suggests; however, this is not because sea otters were never in the area, but rather because these fisheries developed during the period when sea otters were absent from the area as a result of their near-extinction during the fur trade. In summary, available evidence contradicts the notion that sea otters were historically precluded from utilizing the coastline from Point Conception to Rincon Point by large oil seeps in the area. Therefore, we do not address this comment further in the FSEIS.
24	While we understand the economic concerns of the shellfish fisheries industry, this perspective does not represent the full suite of important issues pertaining to sea otter management and conservation. Sea otters also have a number of beneficial ecosystem services, such as the maintenance of kelp forests and a broad array of related indirect effects (Estes *et al.,* 2011).	We discuss the probable beneficial effects that sea otters will have under alternatives that allow for the continuation of natural range expansion under the headings "Nearshore Marine Ecosystem," "Kelp Harvest," portions of "Recreational Fishing and Diving," and portions of "Federal and State Agency Programs."
25	Our family would rather restrict fishing industries for	Thank you for your comment. It has been noted and

	the prolonged good of the ocean environment, than risk losing species such as the precious sea otters and the other inhabitants of the marine environment that we cherish and can never replace. We will change our diet to influence this end.	will be included in the administrative record for this action.
26	We are in favor of finally putting an end to that program and allowing Sea otters to expand freely from a restricted territory into the coastal areas of the Santa Barbara Channel and other locations that they choose. This is especially important in light of the new network of Marine Protected Areas (MPA) established by the California Department of Fish & Game. The kelp bed between Campus Point and Coal Oil Point — within the new MPA — has been an important rafting site for otters.	We agree that the presence of sea otters in the MPAs established by CDFG is consistent with many of the goals set for those areas. See sections 6.2.11.4, 6.3.11.4, 6.4.11.4, 6.5.11.4, 6.6.11.4, and 6.7.11.4 for a detailed discussion of these goals and effects on MPAs under each of the alternatives under consideration.
27	The Service admits that "sea otter range expansion along the central California coast is known to have reduced abalone population levels and size distributions" but concludes there is no conflict between the preferred alternative and white abalone survival and recovery. Introducing an apex predator into abalone habitat will have significant, if not fatal, consequences for the future of this endangered species.	We discuss potential future effects on white abalone of the preferred alternative (Alternative 3C) in sections 6.2.3.1, 6.7.3.1, and 6.9.2 of the RDSEIS/FSEIS. We note that the effects of Alternative 3C are identical to baseline conditions. Currently, southern sea otters are present at San Nicolas Island and are naturally recolonizing their historic range in the management zone. Under the proposed action, those conditions will continue. NOAA, the federal agency with ESA jurisdiction over the endangered white abalone, has stated that it "supports USFWS' efforts to recover southern sea otters throughout their range," and NMFS, which NOAA oversees, has stated that it "does not support the alternatives that involve some level of sea otter removal from the management and/or translocation zones" (NOAA 2011). The effect of the preferred alternative is not to "introduce" an apex predator into abalone habitat as the commenter suggests. Rather, it would continue baseline conditions of natural sea otter range expansion. Sea otters are naturally recolonizing their historic range, which formerly encompassed the entire range of white abalone until sea otters were hunted to near extinction during the 18th and 19th centuries. Sea otters and white abalone coevolved. We note that white abalone were federally listed as endangered not because of sea otter predation but because of dramatic declines in abundance due primarily to overharvesting for human consumption (66 FR 29046; May 29, 2001). Sea otters have been absent from nearly all of the range of white abalone since approximately 1850 (Scammon 1968). Therefore, very little is known about the specific ecology of sea otter-white abalone interactions. According to one

		researcher with specific expertise with white abalone, "sea otters and abalone have coexisted historically. Many abalone traits are probably the result of selection by sea otters. To that end, sea otters will probably deplete abalone abundance, but not extirpate them. […] [W]hite abalone have a depth refuge from otters" (Lafferty, pers. comm. 2012). Nevertheless, we acknowledge that populations that have been reduced to very low densities are subject to risks that healthy populations are not and that sea otters may consume white abalone where their geographic and depth ranges overlap. We recognize our affirmative responsibilities under the ESA and fully support recovery efforts for endangered white abalone. To lessen the risk that natural range expansion of sea otters (which would occur both under baseline conditions and under alternatives that terminate the translocation program) could interfere with recovery efforts for white abalone, we are committed to working closely with NMFS, CDFG, and the White Abalone Recovery Team to share information that may affect recovery actions for this species. We are also pursuing a Memorandum of Understanding with NMFS to formalize our agencies' mutual commitment to cooperate in facilitating both southern sea otter and abalone recovery efforts.
28	The extremely depleted remnant white abalone population is projected to become extinct without human intervention, and the current accepted plan is to reestablish white abalone by introducing laboratory raised animals to the wild at depths of 18-26 meters. This depth is considered the white abalone's historic optimal habitat and is well within sea otter foraging range. Indeed, in its 2011 section 7 ESA consultation regarding the captive propagation of white abalone, the National Marine Fisheries Service ("NMFS") found that sea otters could pose a significant source of white abalone mortality. More importantly, NMFS determined that "sea otter predation may limit white abalone populations to small individuals that are restricted to cryptic habitats and, thus, are expected to represent a natural threat to the recovery of the species in the wild" (NOAA 2011).	The White Abalone Recovery Plan acknowledges that factors controlling the natural depth distribution of white abalone are poorly known but suggests that white abalone may have been restricted to deeper waters (> 25 m) historically as a result of sea otter predation or competition from pink abalone (NMFS 2008). Because sea otters and white abalone coevolved, it is unlikely that depths from 18-26 m constitute "historic optimal habitat" for adult, non-cryptic white abalone (although cryptic juveniles can coexist with sea otters at these depths where sufficient cryptic and inaccessible habitat exists). Outplanting will occur at existing Baby Abalone Recruitment Modules, which are located at depths of 18-26 meters (60-85 feet). These depths are more easily accessible to researchers than deeper depths, but we are unable to locate any statement in NMFS documents to the effect that these depths constitute "historic optimal habitat" for white abalone. Nevertheless, we recognize that sea otters could affect outplanting efforts if white abalone populations are established within the depth range

		utilized by sea otters and within the geographic area reclaimed by natural sea otter range expansion. The section 7 consultation to which the commenter refers is a biological opinion for a proposal to issue a permit to the University of California-Davis, Bodega Marine Laboratory, for captive propagation, disease investigations, and experimental field planting of white abalone off Southern California. The BO states that interactions with southern sea otters would be minimized by choosing field planting areas that are beyond the current range of the southern sea otter. Additionally, one mitigation measure included in the BO is that field planting of white abalone must be coordinated with the Service. We are coordinating with NMFS to share information on sea otter movements and likely range expansion to minimize the potential that sea otters could affect shallow-water outplanting efforts for white abalone, and we will continue to do so if an alternative allowing for continued natural range expansion is selected. The sentence the commenter quotes from the BO occurs in a general discussion of predators of white abalone and immediately follows a statement by NMFS recognizing that "in central California, several abalone species (red, flat, pinto and black) co-exist with sea otters." We note that sea otters have been absent from nearly all of the range of white abalone since approximately 1850 (Scammon 1968), and that as a result very little is known about the specific ecology of sea otter-white abalone interactions. The citation used to support the statement that "sea otter predation may limit white abalone populations to small individuals that are restricted to cryptic habitats and, thus, are expected to represent a natural threat to the recovery of the species in the wild," Johnson *et al.* (2009), does not refer to white abalone or the potential for white abalone recovery. In fact, the study discussed in Johnson *et al.* (2009) did not identify specific abalone species and occurred almost entirely along the central coast of California, well north of, or at the northern limit of, the geographic range of white abalone. Therefore, reliance on the study to support a conclusion that sea otters represent a threat to white abalone is questionable. See also our response to comment 27.
29	The Service states that sea otter predation will not be a problem because white abalone will have recovered to sufficient numbers by the time sea	We do not limit our analysis to 10 years. Although we attempt to quantify only those impacts occurring within the next 10 years, we also qualitatively

	otters fully occupy white abalone habitat. The Marine Mammal Commission's January 3, 2006 letter to the Service calls the Service's position an "assumption" that is both "questionable" and "unlikely." The Service arbitrarily limits its almost non-existent analysis of sea otter predation impacts to a ten-year time frame, ignoring the fact that the recovery of white abalone will take decades. Sea otter predation over those decades is likely to prevent the recovery of the endangered white abalone, if not jeopardize its very survival.	describe impacts occurring beyond the 10-year horizon. We state that natural sea otter range expansion throughout the Southern California Bight and white abalone recovery would both likely require decades. While we point out that the stretch of coastline that sea otters are expected to reoccupy within the near future is at the northernmost end of the white abalone's historic range, whereas white abalone population centers and key recovery areas are mostly in the southern half of the Southern California Bight, we acknowledge that it is unknown whether white abalone would reach recovery targets before sea otter range expansion occurred in important white abalone recovery areas. We note that the white abalone recovery plan ranks the severity of the risk to white abalone from combined non-human predation (*i.e.,* fishes, invertebrates, and sea otters) as "moderate" on a scale ranging from low to very high and the geographic scope and level of certainty that white abalone would be affected by combined non-human predation as "moderate." The overall ranking of this threat is 9 (1 being highest priority, 10 being lowest priority) (NMFS 2008). The commenter does not offer evidence to support the assertion that sea otter range expansion and predation will prevent the recovery or jeopardize the continued existence of white abalone. To date, the only threat that has driven white abalone nearly to extinction is human overexploitation. See sections 6.2.3.1, 6.7.3.1, and 6.9.2 of the RDSEIS/FSEIS for our full analysis, and see also our responses to comments 27 and 28.
30	In its January 3, 2006 letter to the Service, the Marine Mammal Commission stated that the Service's "assumption that white abalone's primary habitat is in water too deep for the otters to forage is […] questionable" and that the Service's Preferred Alternative "would further exacerbate the decline of white abalone." The Commission noted that abalone were first found in their optimal habitat, "shallow, protected areas" and called the deeper waters to which the Preferred Alternative would confine white abalone "suboptimal habitat." The net effect of the Preferred Alternative is to confine white abalone to sub-optimal habitat.	The commenter refers to a letter submitted by the Marine Mammal Commission on our 2005 DSEIS, which we modified based on comments we received during the 2005-2006 comment period, including those from the Marine Mammal Commission. We point out that we make no statements in the 2005 DSEIS or RDSEIS regarding "primary" habitat but rather emphasize that the depths at which white abalone occur and the typical foraging depths of southern sea otters overlap only partially. We note further that because of the relative dearth of fishery-independent data for white abalone and the lack of any abalone abundance data for the period preceding the fur-trade removal of sea otters from the ecosystem, the Marine Mammal Commission's assessment of the importance of shallow waters is, necessarily, based on fishery-dependent data derived from a period when white abalone had been released from predation pressure by a native apex

		predator. The Marine Mammal Commission states, "Initially white abalones were most abundant in shallow, protected areas. As they were extirpated, the fishery moved into deeper water into what is probably a suboptimal habitat but the last refuge from human exploitation." We believe these data are more reflective of fishery effort and a preference for harvesting abalone in shallower waters than of the natural distribution of the species in the context of a functioning ecosystem (one that includes native apex predators). See also our response to comment 28.
31	The Service's conclusion that the Preferred Alternative presents no problem for white abalone because sea otters do not forage at depths below 40 meters is wrong. Available data contradict the Service's view that sea otter foraging stops at 40 meters. California adopted regulations to limit the accidental drowning of foraging sea otters by prohibiting the setting of gill and trammel nets on the ocean bottom in waters less than 109 meters throughout the sea otter's current range. The State took this action because of clear and convincing evidence that sea otters are foraging at those depths. The evidence included systematic aerial surveys documenting large numbers of sea otters observed beyond the 90 meter depth contour. Sea otters have also been caught in king crab trap sets in Alaska at depths of 80 meters. Time depth recorders implanted in sea otters document sea otter foraging in California and Alaska waters at depths greater than 88 meters. Multiple observations by NMFS officials of sea otters caught in Pacific cod traps set at depths ranging from 44-73 meters in Alaska further demonstrate that sea otters forage within abalone range depths.	We do not state that sea otters do not forage at depths below 40 meters but rather that southern sea otters *usually* forage in waters shallower than those in which white abalone are now found. We cite the results of a study on southern sea otters in the southern end of their range (Tinker *et al.* 2006a), which found, based on data from time-depth recorders, that critical foraging habitat (the depth range including 95 percent of recorded foraging dives) was shallowest for females at the center of the range, 2-20 m (7-66 ft), deeper for males at the center of the range, 2-35 m (7-115 ft), and slightly deeper still for males near Point Conception, 2-40 m (7-131 ft). Because sea otters usually forage within depths of 40 m or less, white abalone will only rarely be exposed to the risk of sea otter predation at depths greater than 40 m. We acknowledge that some sea otters sometimes dive deeper than 40 m. Regulations intended to prevent *any* incidental take of southern sea otters would presumably account for the deepest dives of the deepest-diving individuals, even if these dives are rare. Although more than 99 percent of southern sea otter dives are to depths of 40 m (131 ft) or less, individuals occasionally dive to depths of approximately 100 m (328 feet) (Tinker pers. comm. 2008).
32	The Service asserts certain offshore banks "may provide refuge for white abalone from sea otter predation." Tanner Bank and Cortes Bank are not optimal white abalone habitat.	Tanner Bank and Cortes Bank have the highest population densities of white abalone among areas surveyed (Hobday *et al.* 2001, Butler *et al.* 2006) and have been identified as key recovery areas (CDFG 2005c). After San Clemente Island, these offshore banks were historically the most productive areas for the white abalone fishery, followed by Santa Barbara Island (Rogers-Bennett *et al.* 2002). The commenter does not offer any evidence to support the assertion that these banks are not optimal white abalone habitat. Therefore, we are unable to address the comment further.

33	The reason sea otters and abalone are incompatible in the circumstances that exist today is seen by examining sea otter consumption rates of abalone. If a group of only 50 male sea otters moved into an abalone area, and each sea otter weighed an average of 60 pounds, typical for male sea otters, and each ate 25-30 percent of its body weight daily, again typical for sea otters, and if 60 percent of the diet was abalone, then these sea otters could easily consume approximately 500 pounds of abalone each day. In only one year, it would be possible for the sea otters to consume 90 tons of abalone. For comparison purposes, in 1996, the last year the commercial abalone fishery was open, commercial abalone landings were 114.75 tons.	Sea otters appear to preclude abalone fisheries within their range, but they are not "incompatible" with the existence of abalone. Although the expansion of southern sea otters along the central California coast dramatically reduced fishery landings for red abalone during the 1960s (Wendell 1994), low but stable densities of red and black abalone have existed for decades in densely occupied portions of the southern sea otter range. Micheli *et al.* (2008) found that black and red abalone at eight central California sites, all within sea otter habitat, persisted at low but stable densities when protected from human take (although they did not occur at levels that could support fisheries, even at sites protected from human take). The highest black abalone densities occur at northern long-term monitoring sites near the Monterey peninsula, where sea otters have been present for approximately 50 years. In fact, a recent study along the central coast of California (from Pebble Beach to Rancho Marino), where black abalone appear to be unaffected by disease and densities of sea otters and black abalone are relatively high, has found that sea otters do not negatively affect, and in fact may even increase, the abundance of black abalone (Raimondi *et al.*, in prep.). This dynamic may be due to an increase in the availability of drift kelp arising from the positive relationship between sea otters and kelp abundance. In contrast, human exploitation (in combination with disease, in some cases) has reduced all species of formerly commercially exploited abalone throughout California to very low levels compared to their former abundance. The California abalone fishery was closed in 1997, with the exception of a sport-only fishery for red abalone that continues north of San Francisco County. Since the mid-twentieth century, commercial landings data for abalone species in California have demonstrated a pattern of intensive exploitation followed by collapse (Karpov *et al.* 2000). Karpov *et al.* (2000) report that in their examination of the collapse of the abalone fishery in California, they "found no evidence for sustainable commercial catch in the California abalone fishery at any time during the fishery (1942-1996)."
34	The Service's preferred alternative threatens both the survival and the recovery of black abalone. Although the Service admits that black abalone "have nearly been extirpated in southern California	We discuss potential future effects on black abalone of the preferred alternative (Alternative 3C) in sections 6.2.3.2, 6.7.3.2, and 6.9.3 of the RDSEIS/FSEIS. We note that the effects of

	waters," the Service apparently sees no problem with introducing a voracious apex predator into an already precarious circumstance for black abalone.	Alternative 3C are identical to baseline conditions. Currently, southern sea otters are present at San Nicolas Island and are naturally recolonizing their historic range in the management zone. Under the proposed action, those conditions will continue. NOAA, the federal agency with ESA jurisdiction over the endangered black abalone, has stated that it "supports USFWS' efforts to recover southern sea otters throughout their range," and NMFS, which NOAA oversees, has stated that it "does not support the alternatives that involve some level of sea otter removal from the management and/or translocation zones" (NOAA 2011). The effect of the preferred alternative is not to "introduce" an apex predator into abalone habitat as the commenter suggests. Rather, it would continue baseline conditions of natural sea otter range expansion. Sea otters are naturally recolonizing their historic range, which formerly overlapped with much of the range of black abalone until sea otters were hunted to near extinction during the 18th and 19th centuries. Sea otters and black abalone coevolved. The extirpation of southern sea otters from most of their former range is believed to have been responsible for the large aggregations of black abalone evident in California and Mexico during the nineteenth and twentieth centuries (Haaker *et al.* 2001). We note that black abalone were federally listed as endangered not because of sea otter predation but because of dramatic declines in abundance due to disease and overfishing (74 FR 1937; January 14, 2009, Van Blaricom *et al.* 2009).). Nevertheless, we acknowledge that the severe reduction of black abalone populations as a result of human overexploitation and disease has rendered them more vulnerable to all sources of mortality, including natural sources such as predation by marine organisms. The final status review for black abalone ranks the severity of the overall threat level posed by sea otter predation as "medium" (see Table 6, Van Blaricom *et al.* 2009). It notes that although sea otters are known to prey on black abalone, the quantitative ecological strength of the interaction is poorly understood (Van Blaricom *et al.* 2009). In its responses to comments in the final critical habitat designation for black abalone, NMFS states, "the best available data do not support the idea that sea otter predation was a major factor in the decline of black abalone populations or that it will inhibit the recovery of the species" (76 FR

		66806; October 27, 2011). We recognize our affirmative responsibilities under the ESA and fully support recovery efforts for endangered black abalone. To lessen the risk that natural range expansion of sea otters (which would occur both under baseline conditions and under alternatives that terminate the translocation program) could interfere with recovery efforts for black abalone, we are committed to working closely with NMFS, CDFG, and the Black Abalone Recovery Team (once it has been convened), to share information that may affect recovery actions for this species. We are also pursuing a Memorandum of Understanding with NMFS to formalize our agencies' mutual commitment to cooperate in facilitating both southern sea otter and abalone recovery efforts.
35	What the Service ignores is that in the mid-1980s, a pathogen began infecting black abalone populations along the southern California and Mexican coasts, causing 95-98 percent mortality. The evidence indicates that the mass mortality associated with this disease is continuing northward. Adding sea otter predation on top of this devastating disease could cause a total population collapse of black abalone in southern California.	We mention or discuss withering syndrome in sections 4.3.1.1, 4.3.2.6, 4.3.3.2, 6.2.3.2, 6.4.3.2, 6.5.3.2, 6.6.3.2, 6.9.2.1, 6.9.3.1, 6.9.3.2, 6.9.3.4, and 6.9.3.5 of the RDSEIS/FSEIS. We acknowledge the importance of coordinating with NMFS on recovery actions for black abalone (see also our response to comment 37). We note that in its responses to comments in the final critical habitat designation for black abalone, NMFS states, "one of the only places in southern California where black abalone populations have been increasing and where multiple recruitment events have occurred since 2005 (*i.e.,* San Nicolas Island) is also the only place south of Point Conception where a growing population of southern sea otters exists, indicating that black abalone populations can recover and remain stable in the presence of sea otters" (66 FR 66806)
36	The Service's proposed action is a serious threat not only to endangered abalone but also to every other depleted species of abalone in southern California, including the pink and green abalone. The additional pressure of sea otter predation may have the effect of moving these populations into the endangered category. Adding sea otters as a top predator to already depleted resources will jeopardize their existence. As noted in one scientific report: "Persistent occupation and continued immigration into southern California could have serious ramifications for the recovery of the abalone resource and for other invertebrates as well." California Cooperative Fisheries Investigators 1999.	We have added a discussion of potential effects on CDFG's efforts to restore depleted (but not federally listed) abalone populations, including pink and green abalone, to sections 4.4.9.4, 6.2.11.4, 6.3.11.4, 6.4.11.4, 6.5.11.4, 6.6.11.4, and 6.7.11.4 of the FSEIS.
37	Section 7(a)(2) of the ESA requires that every Federal agency "shall...insure that any action authorized, funded, or carried out by such agency...	See also our responses to comments 27 and 34, which contain additional information specific to white and black abalone, respectively.

	is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of habitat of such species which is determined... to be critical." 16 U.S.C. §1536(a)(2). The Service simply cannot ensure that the preferred alternative will not jeopardize the continued existence of endangered abalone. Section 7(a)(1) of the ESA requires that the Secretary of the Interior review programs administered by the Interior Department and utilize such programs in furtherance of the purposes of the ESA. 16 U.S.C. §1536(a)(1). The failure to take action to protect the endangered white abalone and the endangered black abalone violates this mandatory duty. Further, allowing unlimited sea otter range expansion is an action that will result in a taking of endangered white and black abalone in violation of the prohibition set forth in §9(a)(1)(B) of the ESA, 16 U.S.C. §1538(a)(1)(B). In sum, the Service is proposing a preferred alternative that likely violates the ESA at several levels. First, the agency action will allow unlimited sea otter range expansion which will result in a prohibited taking of endangered abalones. Second, the Service has failed to implement its §7(a)(1) responsibilities because it has failed to fully and adequately consider the impact of its actions on the survival and recovery of endangered abalone and to affirmatively take action to protect these abalone. Finally, the Service is proposing an action that will jeopardize the continued existence of endangered abalone in violation of §7(a)(2).	We have carefully considered the effects of the preferred alternative, Alternative 3C, on endangered white and black abalone and black abalone critical habitat. We discuss the potential future effects of Alternative 3C on white and black abalone in sections 6.2.3, 6.7.3, and 6.9 of the RDSEIS/FSEIS. We note that the effects of Alternative 3C are identical to baseline conditions. Currently, southern sea otters are present at San Nicolas Island and are naturally recolonizing their historic range in the management zone. Under the proposed action, those conditions will continue. NOAA has stated that it "supports USFWS' efforts to recover southern sea otters throughout their range," and NMFS has stated that it "does not support the alternatives that involve some level of sea otter removal from the management and/or translocation zones" (NOAA 2011). We recognize our affirmative responsibilities under the ESA and fully support recovery efforts for endangered white and black abalone. To lessen the risk that natural range expansion of sea otters (which would occur both under baseline conditions and under alternatives that terminate the translocation program) could interfere with recovery efforts for white or black abalone, we are committed to working closely with NMFS, CDFG, the White Abalone Recovery Team, and the Black Abalone Recovery Team (once it has been convened), to share information that may affect recovery actions for these species. We are also pursuing a Memorandum of Understanding with NMFS to formalize our agencies' mutual commitment to cooperate in facilitating both southern sea otter and abalone recovery efforts. Resumption of the containment component of the translocation program could potentially benefit abalone by preventing the effects of sea otter predation predicted under future baseline conditions and Alternative 3C. However, we determined that resumption of containment would jeopardize the southern sea otter and violate Section 7 of the ESA (USFWS 2000). We based this conclusion, in part, on the recognition that reversal of southern sea otter population declines and expansion of the southern sea otter's range is essential to the survival and recovery of the species. In order to resume containment, we would have to reinitiate consultation under the ESA to consider any new information and conclude that continuation of

		the program would not jeopardize the southern sea otter. However, resumption of sea otter containment could result in increased mortality of sea otters and disrupt behavior throughout the range of the species. Additionally, it would artificially restrict the southern sea otter's range, increasing its vulnerability to oil spills, disease, and stochastic events relative to the baseline. In combination, these effects would slow or prevent the recovery of the species. We are not at liberty to jeopardize the southern sea otter in order to benefit listed abalone species. Given these circumstances and the ESA mandate that the Service and NMFS seek to recover threatened and endangered species, the best—and currently the only legal—approach available to us is to cooperate with NMFS to facilitate recovery actions that benefit both species and minimize adverse effects on both species. This approach is in furtherance of, and not violative of, our obligations under both 7(a)(1) and 7(a)(2) of the ESA. The commenter's assertion that the Service is "taking" abalone by failing to restrict sea otters from inhabiting their historic range reflects a misunderstanding of the ESA. Southern sea otters are naturally expanding into their former range. The Service could deter range expansion only by taking affirmative action to contain sea otters and return them to the parent range. The Service may not take such affirmative action because containment would jeopardize the continued existence of the southern sea otter (USFWS 2000). Thus, any effects that southern sea otter range expansion may have on abalone or abalone critical habitat are a function of the natural migration and predation patterns of the sea otter and not the result of—or attributable to any—action on the part of the Service.
38	Several other species of shellfish (besides abalone) will also see their populations plummet, perhaps to endangered status, if the preferred alternative is adopted. The Service states that sea otters "consume an amount of food equivalent to 23 to 33 percent of their body weight per day." Having admitted this fact, the Service never considers its implications for the future of California's shellfish. Those implications are made clear by examining what will happen to commercial fishermen if the preferred alternative is adopted. As scientists have noted, "Unless the sea otter is eventually contained, the State's Pismo clam, sea urchin, abalone, certain crab, and possibly lobster fisheries will be precluded.	We acknowledge that sea otters are likely to decrease the densities of benthic invertebrates within the sea otters' dive depth range as they recolonize their historic habitat. However, the commenter does not offer any information to support the assertion that sea otters would cause shellfish populations to decline to "endangered status" and does not identify which species are the subject of this concern. The statement quoted by the commenter notes that although sea otters may reduce the non-cryptic portion of certain shellfish populations to densities that cannot sustain profitable commercial fisheries, "sea otters do not extirpate these shellfish stocks."

	Sea otters do not extirpate these shellfish stocks, they merely reduce the exposed biomass to densities well below those necessary for profitable commercial exploitation or satisfactory recreational use."	We disagree with the commenter's assertion that we do not consider the implications of sea otter prey consumption on shellfish populations currently exploited by commercial fisheries in California. We consider the implications of sea otter range expansion (and the restriction of natural range expansion) on shellfish fisheries under each of the alternatives in detail. See sections 6.2.4, 6.3.4, 6.4.4, 6.5.4, 6.6.4, and 6.7.4 of the RDSEIS/FSEIS.
39	Rather than address the true ecosystem impacts of the preferred alternative on the shellfish resources off California, the Service simply decides that these parts of the ecosystem, and the fishermen who depend on them, are unimportant and are to be sacrificed.	We describe the effects of sea otters on the nearshore marine ecosystem in section 6.2.2 of the RDSEIS/FSEIS. While densities of invertebrate prey species would decrease, the abundance of kelp and kelp-canopy-dependent species would likely increase. Benthic invertebrates such as sea urchins and abalone evolved in the presence of sea otters (*e.g.,* Estes *et al.* 2005). Although sea otters prey on these species, they also benefit them indirectly through an increased abundance of drift kelp (*e.g.,* Raimondi *et al.* in press). The loss of apex predators from ecosystems is increasingly recognized as having far-reaching consequences (Estes *et al.* 2011). Reductions in the densities of prey populations due to the return of apex predators are "expected and desired from the perspective of ecosystem management" (Ugoretz 2002). The return of large apex consumers is thus expected to have beneficial effects on the ecosystem as a whole. We consider the implications of sea otter range expansion (and the restriction of natural range expansion) on shellfish fisheries under each of the alternatives in detail. See sections 6.2.4, 6.3.4, 6.4.4, 6.5.4, 6.6.4, and 6.7.4 of the RDSEIS/FSEIS.
40	NMFS recommends that the Service analyze more carefully the claim that there will be minimal adverse impacts to abalone over the next ten years from the No Action Alternative or Preferred 3A Alternative. The claim is based on a number of assumptions, some of which have a high level of uncertainty associated with them (see detailed comments below). NMFS believes that this is a best case scenario for abalone and that the possibility of a moderate level of adverse impact is just as likely. The assumptions associated with a moderate level of impact should be explored more fully and included in the analysis. The Service seems to argue throughout the	The preferred alternative (Alternative 3C) would result in a continuation of management practices that have been in place since 1993 (enforcement of the management zone has been suspended, and natural range expansion has been occurring unimpeded, since 1993). Therefore, the preferred alternative would not affect white or black abalone relative to the baseline. However, we have revised our analysis of the effects on white and black abalone expected to occur as a result of continued natural sea otter range expansion under the baseline to reflect a greater potential for detrimental effects on these species and a greater level of uncertainty overall. See sections 6.2.3.1 and 6.2.3.2 of the FSEIS.

	document that increasing sea otter abundance will not have species-level impacts on abalone because there are too few of them, or that wild animals are cryptic, or out of the otter's diving depth range. All of these assumptions carry some level of uncertainty with them. This uncertainty is complicated by the fact that recovery implementation programs being undertaken by State, Federal, non-governmental, and private entities are putting a lot of effort into increasing abundance of abalone in a number of target locations throughout the Southern California Bight (NMFS 2008). The Service should acknowledge that their conclusions regarding minimal impacts of the preferred alternative is based on a number of assumptions including the assumption that abalone populations will not change over a 10-year period due to natural and/or human intervention efforts. Current data collected by a variety of State and federal agencies suggests that abalone populations are increasing (naturally) in certain locations throughout Southern California. The impacts of the Service' preferred alternative on State/Federal/private recovery programs should be acknowledged and analyzed. P. 273 NMFS believes that impacts to abalone should be characterized as moderate to high depending on how things play out. If local recovery of abalone populations occurs in habitats without predator refuge (i.e. shallower waters/deep crevices) naturally or through human related actions over the next 10 years, then just a few sea otters in the right place at the right time could hinder the recovery of the species throughout its range. In NMFS' view, hindering the recovery of critically endangered species does put the entire species at greater risk of extinction. This "worst case scenario" for abalone is just as likely as the scenario presented to justify the "moderate" level of impact to abalone whereby abalone occupy depth and/or crevice refugia.	We recognize our affirmative responsibilities under the ESA and fully support recovery efforts for endangered white and black abalone. We are committed to working closely with NMFS to share information that may affect recovery actions for these species. Specifically, we are working with NMFS to convene a working group composed of managers and scientists that have southern sea otter and abalone expertise to benefit the recovery of white and black abalone. We are also pursuing a Memorandum of Understanding with NMFS to formalize this and other cooperative efforts to facilitate the recovery of sea otters alongside the recovery of white and black abalone. See also our responses to comments 29, 34, and 35.
41	NMFS suggests that the Service consider analyzing the impacts of each of the alternatives on the multi-agency, multi-partner recovery program that is being led by NMFS for black and white abalone and by the CDFG for the other species of abalone (note: this agency program is different from the Abalone Fishery Restoration Program that is included in Tables 0-1 and 6-78).	We have added a consideration of effects on NMFS-led recovery actions planned for white abalone (as outlined in the white abalone recovery plan, NMFS 2008) to sections 6.2.3.1, 6.3.3.1, 6.4.3.1, 6.5.3.1, 6.6.3.1, and 6.7.3.1 of the FSEIS. Because there is not yet a Federal recovery plan for black abalone, we are unable to comment specifically on effects on future NMFS-led recovery actions for black abalone. However, we do evaluate the effects of the

		alternatives on potential future efforts to translocate and/or aggregate exposed black abalone into crevice habitat. See sections 6.2.3.2, 6.3.3.2, 6.4.3.2, 6.5.3.2, 6.6.3.2, and 6.7.3.2 of the FSEIS. We have added information regarding effects of the alternatives on the State's recovery efforts for other species of abalone (as outlined in the Abalone Recovery and Management Plan, CDFG 2005c) under the heading "Restoration of Depleted Abalone Species (Not Federally Listed)" in sections 6.2.11.4, 6.3.11.4, 6.4.11.4, 6.5.11.4, 6.6.11.4, and 6.7.11.4 of the FSEIS.
42	NMFS does not support the alternatives that involve some level of sea otter removal from the management and/or translocation zones, as this has proven to be biologically, economically and/or logistically infeasible. However, NMFS is concerned about the potential conflict of the preferred alternative with the goals of recovering the federally listed abalone over the long-term (beyond the 10-year time frame). NMFS believes that the likelihood and intensity of the conflict can be mitigated by creating a working group composed of managers and scientists that have southern sea otter and abalone expertise. NMFS would like the Service to make a commitment to organizing a working group that is focused on minimizing impacts of the preferred alternative to potentially affected ESA species managed by NMFS.	The Service supports recovery efforts for white and black abalone and is committed to working closely with NMFS to share information that may affect recovery actions for these species. Toward that goal, we are pursuing an MOU with NMFS. We agree that convening a working group composed of managers and scientists that have southern sea otter and abalone expertise would be beneficial for the recovery of white and black abalone, and we will work with NMFS to convene this group. We have added a statement highlighting the importance of this effort to our discussion of effects on white and black abalone.
43	P. 41 There is no mention that there is a final recovery plan for white abalone (NMFS 2008) and that one of the primary recovery actions outlined in that plan (restoration in a number of locations at depths varying from approximately 45-100 ft throughout Southern California) may be impacted by expansion of sea otters into Southern California. The Service should refer the NMFS recovery plan (NMFS 2008) for white abalone and discuss how their alternatives impact NMFS' abalone recovery program.	We cite or discuss the final recovery plan for white abalone in sections 4.3.3.1 and 6.2.3.1 of the RDSEIS. We have added a sentence to section 4.3.3.1 explicitly stating that there is a final recovery plan for white abalone. We have added a consideration of effects on recovery actions to restore white abalone in shallow waters to the discussion under each of the alternatives.
44	P. 75 Why is it true that impacts of individual sea otters is not possible to predict? NMFS believes that dietary studies have estimated average daily caloric intakes for male/female sea otters. NMFS believes that estimates of foraging ranges are also available. Somewhere in the document it should be acknowledged that a sea otter venturing into a cove with a few hundred abalone could have a population and possibly species-level impact on abalone.	Daily caloric intake rates for male and female sea otters are available. However, we do not attempt to quantify the effects of individual far-ranging sea otters undertaking sporadic, long-distance movements before the fact because such an effort would require information on the location of the otter, the duration of its presence, its prey preferences, prey availability, and other factors that cannot be forecast. We have added a statement to our discussion of white abalone acknowledging that a single sea otter

		could conceivably have local population effects on exposed abalone (*i.e.,* abalone not in crevice habitat) within its dive depth range.
45	NOAA's Office of National Marine Sanctuaries (ONMS) uses ecosystem-based management approaches to protect our Nation's most vital coastal and marine natural and cultural resources. We believe the proposed action (Alternative 3C) furthers an ecosystem-based management approach by allowing sea otters to recover naturally through expansion from central California into their historic range to the south. We support terminating the southern sea otter translocation program and are committed to research and monitoring with our Federal and State partners to assess changes to the marine ecosystem. We commend the Service in proposing to terminate the failed translocation program and in proposing a course of action that has the potential to reverse the decline in sea otter population numbers.	Thank you for your comment. It has been noted and will be included in the administrative record for this action.
46	The RDSEIS mentions the benefits of the otter to kelp forest habitats, resulting in ecosystem services ranging from reduced coastal erosion to carbon storage for climate change to increased invertebrate and fish diversity (over 800 species), and including benefits to Southern California fisheries. There is a brief mention of the sea otters' role in maintaining the kelp forest structure, but the RDSEIS doesn't adequately describe the importance of this well-studied ecological function of the sea otter. The RDSEIS and Initial Regulatory Flexibility Analysis (IRFA) focuses on ecological and socioeconomic impacts if the otter is allowed in Southern California, but fails to adequately assess impacts if we continue to prohibit its southward migration. Without the otter in Southern California, scientists expect continued degradation of this vital nearshore habitat. The Santa Monica Baykeeper (SMBK) Kelp Program began in 1997 as a response to a large decrease in kelp forest acreage since the early 1900s. One of the major causes of this decline is the lack of sea urchin predators: the southern sea otter, California sheephead, and California spiny lobster. In many areas in Southern California where urchins have been allowed to overpopulate and overgraze, giant kelp have become desolate and barren. The Kelp Program is composed of staff and volunteer AAUS-certified scientific divers that monitor and restore kelp beds off the Malibu and Palos Verdes coasts. After years of trial and research, it was determined	We discuss the "keystone" role of sea otters in nearshore marine ecosystems in section 6.2.2 of the RDSEIS/FSEIS and acknowledge the resulting ecosystem services arising from the increased abundance of kelp, including reduced coastal erosion, carbon storage for climate change, increased biodiversity, and potential beneficial effects on finfish fisheries.

	that reducing urchin density was the number one most effective method for restoring kelp forests. Restoration sites span a variety of oceanographic conditions and levels and types of pollution, yet kelp was restored in every single restoration site where urchin density was reduced to approximately one to two urchins per square meter. In areas where the otter is allowed to exist and flourish, urchins are often kept in control by the otter at these same relative densities. Further, it is far less expensive to allow the sea otter into Southern California than to fund large-scale restoration work at sea. Sheephead and lobster populations, if allowed to flourish, may perform a similar ecological function, but not as effectively as the otter. SMBK will continue to restore giant kelp forests in the hopes that hands-on restoration and maintenance will no longer be needed after the otter's range expands to the MPAs of Los Angeles County and southward. It is the belief of SMBK staff biologists and many marine ecologists that the sea otter is needed to permanently solve the threat of urchin barrens and kelp forest ecosystems out of balance in Southern California.	
47	What is desperately needed is a paradigm shift in our way of thinking and living on this unique planet. One important step towards that necessary shift is the elimination of the ill-advised and doomed sea otter containment program. We can no longer afford to allow any particular industry to impact local ecosystems for short-term financial gain. Almost all efforts to control wildlife, to change their habits and behavior to accommodate the needs of our ever-growing population, end in failure or near disaster.	Thank you for your comment. It has been noted and will be included in the administrative record for this action.
48	Much like the sea otter recovery and restoration effort, we must also work to recover and restore our working waterfronts and coastal communities. Southern sea otters bring in significant tourism revenue to California's coastal communities and keep coastal kelp bed ecosystems healthy. Commercial and recreational fisheries also contribute significantly to the coastal economy and depend on healthy marine ecosystems to remain sustainable. Therefore, I encourage the Service to work with State and local government agencies, resource managers, fishermen, and other concerned parties to develop effective and practical management strategies that balance sea otter recovery and the people who depend on our oceans to make a living.	The Service remains committed to working with State and local government agencies and concerned parties to achieve sea otter recovery and healthy and diverse nearshore marine ecosystems, which serve as the foundation for all sustainable ocean-dependent activities.
49	The country's natural resources are for the benefit	Thank you for your comment. It has been noted and

	of all citizens, and this program hurts the ecology of our oceans to the benefit of a narrow interest group.	will be included in the administrative record for this action.
50	Sea otters consume intertidal mussels (Harold 1986). Removal of mussel beds by sea otter predation will remove an important biogenic shelter for the recruitment and predator protection of young, newly settled abalone.	Mussel beds are not known to be important settlement habitat for black abalone (Raimondi, pers. comm. 2012).
51	The Service can take no comfort in the fact that sea otters and black abalone share the same habitat north of Point Conception and at San Nicolas Island. The fact that sea otters and black abalone share the same habitat north of Point Conception and that black abalone populations are not recovering serves only to prove the point that black abalone populations are unlikely to recover in areas where sea otters are present.	Whereas southern California stocks have been severely reduced by overfishing and disease in southern California waters in the general absence of sea otter predation, healthy populations of black abalone can still be found in areas within the sea otter's long-established range along the central California coast. The highest black abalone densities occur at northern long-term monitoring sites near the Monterey peninsula, where sea otters have been present for approximately 50 years. In its responses to comments in the final critical habitat designation for black abalone, NMFS states, "one of the only places in southern California where black abalone populations have been increasing and where multiple recruitment events have occurred since 2005 (*i.e.,* San Nicolas Island) is also the only place south of Point Conception where a growing population of southern sea otters exists, indicating that black abalone populations can recover and remain stable in the presence of sea otters" (66 FR 66806).
52	Estes *et. al.* (unpublished) speculate that kelp forest ecosystems may sequester carbon, leading to a net reduction in atmospheric carbon dioxide. Specifically, sea otters positively affect the distribution and temporal stability of kelp forests that, if the kelp forest is highly productive, can sequester significant amounts of inorganic carbon from the environment, thus reducing both greenhouse gasses and increasing ocean pH.	We acknowledge the potential effects of sea otters on carbon sequestration in section 6.2.2 of the RDSEIS/FSEIS.
53	Removing a top predator, in this case southern sea otters, from the nearshore ecosystem has dramatic negative impacts on the health and biodiversity that would normally exist in the presence of southern sea otters. *224* The expansion of southern sea otter populations will aid in the restoration and maintenance of kelp forests off the coast of Santa Barbara. These kelp forests provide many valuable services, directly and indirectly, to humans. These services include reduced shoreline erosion, carbon storage that can moderate climate change, and improved habitat for numerous invertebrates such as mussels and clams, and several fish species. The ecosystem services provided by kelp forests have	We describe the relationship between sea otters and the nearshore marine ecosystem in section 6.2.2 of the RDSEIS/FSEIS.

	been valued by other scientists at $7,600 an acre per year.	
	Fisheries and Other Economic Impacts	
54	Closing additional areas outside 3 miles along the coastline between Santa Barbara and Port Hueneme, Santa Barbara and Ventura counties, will devastate these fisheries. Sea otters have not been observed in this area, and two seasons of observation by NMFS observers did not document any interactions.	The RDSEIS/FEIS analyzes the potential for additional areas to be subject to gill and trammel net closures in the future as result of action by CDFG or NMFS because such closures are a potential indirect consequence of the change in the regulatory status of sea otters under Alternatives 3A-3C. However, the Service does not have management authority for these fisheries, and the proposed action – termination of the translocation program – does not include a proposal to close any area to gill and trammel net fishing. We do not advocate closures in areas where sea otters do not occur. We are aware that sea otters are currently very rare in the area we analyze as being potentially subject to fishery closures, although individual sea otters likely occasionally transit it. Sea otters began recolonizing their historic range in the Southern California Bight in 1999, but the furthest range extent documented thus far has been at Coal Oil Point, west of Santa Barbara (see section 6.1.4.1 of the RDSEIS/FSEIS an explanation of how the range end is determined and for a description of anticipated range expansion over the next 10 years). As a result, it is expected that at present the potential for interactions between sea otters and gill and trammel net gear is extremely low. However, if the southern sea otter range expands as expected, the potential for interactions will likely increase in the future.
55	The Service should monitor the actual migration of sea otters and adjust regulations as needed to protect local fisheries from premature and unwarranted closure. The Service should also treat the drift net and set net fisheries differently because drift gear is deployed overnight, and few or no sea otters have been observed swimming or foraging three to five miles offshore at night.	The Service does not have management authority for gill and trammel net fisheries, and none of the alternatives under consideration include a proposal to close any area to gill and trammel net fishing. The current shore-based method of radio-tracking sea otters (which generally requires both the ability to receive a radio signal and visibility) has limited both night-time and far-offshore observations of sea otters. However, time-depth recorders, which are not subject to a shore-bias and do not require visibility, indicate that sea otters frequently forage and travel at night. Therefore we do not believe that the drift net and set net fisheries pose widely different risks to sea otters.
56	The Service has grossly underestimated the value of the white seabass and spiny lobster fisheries by using a 10-year average ex-vessel price rather than current market values.	The quantitative analysis in the RDSEIS/FSEIS is intended to allow for the comparison of different alternatives across many different impact topics. Therefore, it is necessary to maintain a consistent methodology. We use a 10-year average to

		establish the baseline for commercial fisheries landings and ex-vessel revenues. The ex-vessel value of all fisheries tends to fluctuate according to demand and available supply. For some fisheries, the ex-vessel price will be higher at the end of this period, whereas for others, the price will be highest during the middle or at the beginning of this period. We use a 10-year average to dampen these fluctuations and standardize ex-vessel values for inflation to 2009 dollars.
57	It appears that the Service has already decided what its recommendation to the CDFG will be regarding potential gill and trammel net closures and that comments submitted during the comment period will not be considered.	None of the alternatives under consideration include a proposal to close any area to gill and trammel net fishing. Our analysis of effects on these fisheries in the RDSEIS/FSEIS presents a low estimate (no additional closure) and a high estimate (immediate closure of the area to 104 m (341 ft)). Our rationale for choosing 104 m (341 ft) as the maximum depth to which a gill and trammel net gear closure could be extended is explained in section 6.2.4.6 of the RDSEIS/FSEIS. Our intention here is not to advocate for such a closure but to disclose the maximum potential effect on these fisheries, while also acknowledging that this effect might not occur at all.
58	Multiplied retail values should be presented in addition to ex-vessel values.	Multipliers account for the effects in other industries and areas that result from the spending and jobs created in ocean-dependent industries. Section 4.4.2.1 of the RDSEIS gives multipliers developed by Leeworthy and Wiley (2002) of 2.1 for sea urchins, 2.0 for spiny lobsters, and 2.8 for crabs landed and processed in Ventura County. We have added multipliers for halibut and white seabass to this section of the FSEIS. Although multipliers differ slightly from county to county, these multipliers may be used to derive a rough estimate of the revenues from affected fisheries as they compare to total personal income of the affected counties (see Table 4.4). An estimate of the regional economic impact is included in the analysis of effects on commercial fisheries under each alternative.
59	The Service should offer mitigation for the financial hardship that will result from gill and trammel net closures associated with the proposed action.	The Service does not have management authority for gill and trammel net fisheries, and none of the alternatives under consideration include a proposal to close any area to fishing. Nevertheless, we recognize that additional gill and trammel net closures imposed by CDFG or NMFS are a potential indirect consequence of the change in regulatory status of sea otters under Alternatives 3A-3C. We remain committed to working cooperatively with fishermen and these management agencies to ameliorate any economic effects as they deem appropriate and feasible. We do not advocate closures in areas where sea otters do not occur.

60	Impacts to the shellfish industry are overstated. While we appreciate the Service's desire to err on the side of caution by overestimating, rather than underestimating, impacts on fisheries, we are concerned that the agency's approach is fueling misconceptions that the otters' return to southern California will result in the end not only of shellfish fisheries, but of fisheries in general.	Baseline assumptions for impacts to fisheries are given in section 6.2.4.1 of the RDSEIS/FSEIS. Our assumption that, under a scenario involving natural range expansion, sea otters will eliminate fisheries for sea urchins, lobsters, crabs, and sea cucumbers is based in part on data on proportional prey consumption by sea otters in southern California (see section 4.3.1.2) and in part on past interactions between sea otters and shellfish fisheries along the central coast (Estes and VanBlaricom 1985). Based on recent observations of proportional prey consumption by sea otters at San Nicolas Island (Bentall 2005), it is probable that sea urchin fisheries will be more heavily impacted than crab or lobster fisheries. However, because we lack data on absolute abundance of the prey species in question and the level at which fisheries for lobsters, crabs, and sea cucumbers would become inviable, we conservatively assume that these fisheries cannot coexist with sea otters once an area of range has been fully reclaimed. Although effects may be overestimated, we believe they represent a reasonable upper bound of effects and are sufficient to inform our decisionmaking. We describe the ecosystem changes and probable beneficial effects of sea otter range expansion on finfish abundance under the headings "Nearshore Marine Ecosystem," and portions of "Recreational Fishing and Diving" under each of the alternatives in Chapter 6 of the RDSEIS/FSEIS
61	The Service misdefines the baseline in a manner that overestimates landings and does not account for reduced catches in many fisheries in recent years. The Service should revise its estimates to provide an accurate baseline that reflects the current state of fishing landings and revenue.	We acknowledge in sections 6.2.4.2, 6.2.4.3, 6.2.4.4, 6.2.4.5, 6.2.4.6.1, and 6.2.4.6.2 of the RDSEIS/FSEIS that cyclic variations in populations, adverse weather, market demand, and other factors also influence catch from one year to the next. We use a 10-year average to account for such fluctuations in estimating the baseline ex-vessel value of fisheries. While we recognize that using a 10-year average to determine a baseline for effects on landings under the various alternatives overestimates these effects if a fishery is in decline, we believe that this approach is more reasonable than basing 10-year projections on only one or two years of data.
62	The impact of the preferred alternative on California's shellfish fisheries will be devastating. As the Marine Mammal Commission stated: "It is likely that the southward movement of sea otters will seriously affect all shellfish fisheries in California. Currently the sea urchin, sea cucumber, and lobster fisheries are sustainable and represent important economic assets." The Marine Mammal Commission	The commenter refers to a letter submitted by the Marine Mammal Commission on our 2005 DSEIS, which we modified based on comments we received during the 2005-2006 comment period, including those from the Marine Mammal Commission. We note that in that letter, the Marine Mammal Commission also recommended "that the Service take appropriate steps to implement the proposed

	continued, stating: "the abandonment of the sea otter range management could, over the long term, lead to the elimination of virtually all of the shellfish fisheries along the West Coast; these fisheries have long been major economic and cultural assets over the entire region" (MMC 2006).	management action to retain the population of otters at San Nicolas Island and not to remove otters from the 'no-otter' management zone" (MMC 2006). In its letter on the RDSEIS and proposed rule, the Marine Mammal Commission again "concurred with the Service's overall conclusion that the translocation program has failed to fulfill its primary purpose as a recovery action and that the program should be declared a failure" (MMC 2011).
63	Nearly half of the entire statewide sea urchin harvest typically is taken at San Miguel and Santa Rosa Islands, the two most northern of the Channel Islands, both of which are in the sea otter management zone. These islands are located less than 30 miles from the mainland and can easily be reached by sea otters presently living near Point Conception. It is inevitable that sea otters will eventually find their way into these sea urchin harvesting areas, as is evident in light of numerous sightings of sea otters along the mainland and at the islands both prior to and following initiation of the sea otter translocation plan.	We acknowledge in the RDSEIS/FSEIS that sea otters may eventually expand their range throughout the southern California Bight, including the northern Channel Islands. This expansion would depend on their demographic rates, food supply, and other variables. Although it is conceivable that range expansion to the northern Channel Islands could begin in the short term, several factors suggest that this scenario is not likely. A sensitivity analysis conducted by Tinker *et al.* (2008a) demonstrated that range expansion rates south of Point Conception are driven primarily by female dispersal and survival. Female sea otters (particularly reproductive-age females) exhibit much greater site fidelity and are less likely to make long distance movements than males (Tinker *et al.* 2006a, Chapter 3). Because population growth and subsequent re-colonization of unoccupied habitat requires the presence of reproductive females, range expansion to the islands is limited by female movement patterns. When female sea otters do arrive at the islands, the rate of population growth for the first several years is likely to be slow due to Allee effects (reduced reproductive success at low density) associated with small initial population sizes.
64	The Service identifies the sea urchin fishery, along with the lobster, crab, sea cucumber, halibut and white sea bass fisheries, as the fisheries impacted by the preferred alternative. The economic value of these fisheries approximates $40 million using standard multipliers of ex-vessel value (Wendell 1994).	The commenter refers to estimated potential multiplied losses enumerated in an internal CDFG memorandum dated January 1994 and based on information from 1992, 1989, and 1987 for commercial fisheries, recreational fisheries, and oil and gas development, respectively (Wendell 1994, CDFG unpublished data). These estimates encompass all activity in the Southern California Bight, not just those areas expected to be occupied within a specified time frame based on a quantitative model of projected sea otter range expansion. Without estimating when sea otter range would reach an area (and thus when associated effects would occur), it is impossible to apply standard economic methods such as discounting, and it is impossible to gauge whether it would be reasonable to project current revenues (given increasing or declining trends and potential

		future resource policy and management changes) out to the time when sea otters would plausibly be recolonizing a particular area. Additionally, the estimates are based on information regarding revenues that is approximately two decades old. We believe that this methodology results in a less accurate assessment of impacts than that which is included in this DSEIS/RDSEIS. The DSEIS/RDSEIS evaluates in detail the impacts on shellfish fisheries expected to result from the alternatives under consideration and explains the rationale for the methodology adopted. See sections 6.2.4, 6.3.4, 6.4.4, 6.5.4, 6.6.4, and 6.7.4 of the RDSEIS/FSEIS.
65	Today, California has 300 permitted sea urchin divers and an equivalent number of licensed deckhands. Thirty percent of all divers make 100 percent of their household income from the sea urchin fishery and the average diver derives 63 percent of all household income from the fishery (Hansen and Dewees 2006). These fishermen will suffer irretrievable harm from the preferred alternative.	We analyze effects on the sea urchin fishery in sections 6.2.4.2, 6.3.4.2, 6.4.4.2, 6.5.4.2, 6.6.4.2, and 6.7.4.2 of the RDSEIS/FSEIS. We note that the effects of the preferred alternative on the commercial sea urchin fishery are identical to baseline conditions. Currently, southern sea otters are present at San Nicolas Island and are naturally recolonizing their historic range in the management zone. Under the preferred alternative, those conditions will continue. Over the next 10 years, natural sea otter range expansion is expected to affect a limited portion of the sea urchin fishery in the Southern California Bight, resulting in a 3 percent decrease in landings relative to the Southern California Bight as a whole. Whether sea otters would recolonize other nearshore areas of the Southern California Bight after 10 years would be a function of their demographic rates, food supply, and other variables. If sea otters recolonized these areas at the densities seen in the mainland range for comparable habitat, commercial sea urchin landings would approach zero (in these areas). We expect that it would require many decades for sea otters to recolonize the Southern California Bight.
66	The preferred alternative will also have irreversible impacts on the fish processing industry. If the sea urchin fishery collapsed in southern California, the two sea urchin processors in northern California might survive, but it is likely that only two of the nine southern California processors would survive, and they would survive only because they deal in other seafood products. Even so, these two processors would experience a significant reduction in business. Each sea urchin processor employs 30-60 workers, depending on the season. This	We analyze effects on the seafood processing industry in sections 6.2.6, 6.3.6, 6.4.6, 6.5.6, 6.6.6, and 6.7.6 of the RDSEIS/FSEIS. We note that the effects of the preferred alternative on the seafood processing industry are identical to baseline conditions. Currently, southern sea otters are present at San Nicolas Island and are naturally recolonizing their historic range in the management zone. Under the preferred alternative, those conditions will continue. Over the next 10 years, sea urchin inputs to the seafood processing industry are

	employment represents approximately 495 workers statewide year around. Overwhelmingly, processor employees earn the legal minimum wage and would face difficulties if they needed to find alternative employment. The National Ocean Economics Program, tracking wages paid in ocean related industries, reports that in 2004 the average seafood processing employee in California was paid $33,853 (National Ocean Economics Program, www.oceaneconomics.org). A sample survey of sea urchin processors by the California Sea Urchin Commission suggests a lower average wage is more appropriate, something in the range of $22,000 annually. This would result in an estimated payroll for all California sea urchin processors of approximately $10,890,000 annually—a sizable contribution to the State's coastal communities. If the southern portion of the sea urchin fishery collapsed due to the adoption of the preferred alternative, the seven processors who deal in sea urchin exclusively could be forced to terminate nearly 315 employees. This could mean a loss of $6,930,000 to local economies from lost wages alone. The Service improperly dismisses these impacts as inconsequential.	expected to decrease 3 percent as a result of natural sea otter range expansion under the baseline (as well as under the preferred alternative). Whether sea otters would reoccupy other areas of the Southern California Bight in subsequent years would be a function of sea otter demographic rates, food supply, and other variables. Those areas reoccupied by sea otters would cease to be a source of sea urchin inputs to the seafood processing industry, but the magnitude and timing of this potential future change is unknown. Regarding effects on local economies, we include information in section 4.4.2.1 of the RDSEIS/FSEIS on total personal income to allow for the evaluation of effects in a regional economic context. We note that the total personal income for southern California coastal counties in 2008 (in 2009 dollars) was $763,100,387,000 (www.bea.gov). The loss of approximately 7 million in personal income to local economies represents approximately one one-thousandth of one percent of the total personal income for these counties.
67	In order to remain economically viable, many California fishermen participate in several commercial fisheries in a given season (aka, portfolio strategy). Removing one of the fisheries could impact the overall annual incomes to these fishermen, and any decrease/increase in revenue in one fishery may have impacts on the availability of these fishermen to participate in other fisheries. The suite of commercial fisheries analyzed in this RDSEIS should be expanded to include those fisheries that are part of this "portfolio" strategy (*e.g.,* federally managed fisheries for highly migratory species, coastal pelagic species, salmon, and groundfish). The impacts from the proposed action may have significant economic consequences on the economic viability of fishermen utilizing a portfolio strategy that incorporates fisheries not currently analyzed in this RDSEIS.	We do not agree that any fisheries should be added to the analysis solely because some participants in those fisheries also participate in other fisheries that may be affected by the alternatives under consideration. While we agree that removing one of the fisheries in which a fisherman engages could impact the overall annual income to that fisherman, effects on individuals participating in multiple fisheries, one or more of which is unaffected by the alternatives under consideration, will likely be dampened, not heightened, by their utilization of a "portfolio approach."
68	P. 21 NMFS did not see any detailed discussion or impact analysis in the RDSEIS regarding the proposed mitigation measure of retiring (rather than reissuing) permits for fisheries affected by sea otters when current permit-holders voluntarily relinquish them, thereby reducing competition between permit-holders remaining in those fisheries. A consideration of removing local sources of seafood	We mention the possibility of retiring permits as an example of a potential mitigation measure. However, we do not have regulatory authority over commercial fisheries, and any such measure for State-managed fisheries would need to be fully considered, supported, and implemented by CDFG. In its comments on the RDSEIS, CDFG has questioned the feasibility of developing a fishery

	from the seafood industry and the shore-based infrastructure that supports them also needs to be considered. In other words, there are multiplier effects that need to be addressed in any kind of buyout or other mitigating strategy considered for fishermen. NMFS suggests that a more detailed analysis of these factors be added to the RDSEIS.	management plan that would encompass the species affected by natural range expansion and stated that it would need to consider several factors before determining whether to engage with the Service in considering retiring permits. As a result, we have removed the suggested mitigation measure. We analyze effects on the seafood processing industry in sections 6.2.6, 6.3.6, 6.4.6, 6.5.6, 6.6.6, and 6.7.6. We discuss multiplier effects and offer multipliers to allow for the comparison of fisheries revenues and losses to total personal income in southern California coastal counties in section 4.4.2.1 of the RDSEIS/FSEIS. However, because we have removed the proposed mitigation measure from the FSEIS, we have not added any discussion of multiplier effects related to the retiring of permits.
69	P. 22 The establishment of no-take zones for fisheries will have a significant impact on west coast commercial and recreational fisheries. This impact should be considered under the cumulative impacts section of the RDSEIS. There are present and future no-take zones on the books that do not appear to be adequately analyzed in the current RDSEIS.	We have added a discussion of the effects of MPAs (many of which are areas with no allowed take) on commercial and recreational fisheries potentially also affected by the alternatives under consideration to the cumulative effects analysis. We conclude that there are no significant cumulative effects resulting from the proposed action in combination with the effects of the South Coast MPAs. See section 6.9.4 of the FSEIS.
70	P. 60 For the past several years, CDFG has required the mandatory purchase and use of a lobster report card for sport take of lobster. There should be some preliminary report card information available regarding the private sportfish catch and effort for spiny lobster in southern California. The emergence of hoop netting as a major component of the sport fishery should be noted and addressed in more detail in the RDSEIS.	We have added text recognizing the importance of hoop-netting as a component of the recreational lobster fishery and added preliminary information from lobster report cards to the FSEIS.
71	P. 62 This section does not reference NMFS or the presence of federally managed Fishery Management Plans (FMPs) occurring spatially and temporally in the current and proposed alternatives that address sea otter range expansion. NMFS suggests including a more detailed analysis of the FMPs (e.g., Highly Migratory Species, Coastal Pelagic Species, and Pacific Groundfish) in the baseline and impacts analysis sections. These plans can be obtained from the Pacific Fishery Management Council's website at http://www.pcouncil.org/.	We have added a discussion of NMFS programs to our discussion of potentially affected federal and State agency programs in the FSEIS. Specifically, we have added information on federally managed FMPs.
72	P. 70, Table 5-1 The definitions of significance referenced in this table assume the percentage changes in ex-vessel revenues are independent for the fisheries in question. Many of California fishermen participate in more than one fishery in	We have not modified the definitions of significance in this table. In order to allow for the comparison of effects across impact topics, some level of standardization is required. Although some fishermen may participate in more than one fishery

	any given year (portfolio strategy) and any decrease/increase in revenue in one fishery may have impacts on the availability of these fishermen to participate in other fisheries. NMFS suggests that this table be revised in the RDSEIS to take into consideration that many west coast fishermen employ a portfolio strategy and as such the current definitions of significance in this table may need to be reevaluated. As previously mentioned, it would be imperative to incorporate the expanding hoop net sport fishery into the definition section in this table which focuses exclusively on dive trips. Also, not all dive trips are equal in terms of their expected catch per unit of effort (CPUE). Dive trips early in October have higher CPUE versus later month trips.	in any given year, some may not. The level of significance is not defined for each individual who may be involved in one or more of the activities included as an impact topic in this RDSEIS/FSEIS, but rather for the impact topics themselves. We have changed "Lobster Diving" to "Lobster Fishing" in Table 5-1 to reflect the emergence of hoop-netting as an important component of the recreational lobster fishery. We have also added a consideration of available lobster report card data to our discussion of the recreational lobster fishery in the FSEIS. However, at present, lobster report card data are limited, and insufficient information is available on which to estimate what proportion of the fishery is conducted using hoop nets. Because of the current limitations of the available report card data, we do not base any assessments of significance on these data (see sections 4.4.6 and 6.2.8.1 of the FSEIS for additional explanation). We do not assume that lobster dive trips are equal in their expected CPUE. However, we do not differentiate between dive trips made in early October and those made later in the year because the effects of the alternatives under consideration are not seasonal. Our intention in defining levels of significance is to capture average annual effects summed over a 10-year time horizon (we discuss longer-term effects qualitatively but do not assign these longer-term effects levels of significance) and to relate these effects to an appropriate context (generally the Southern California Bight)..
73	P. 75 If the Service does not quantify the effects of individual far-ranging sea otters due to the fact that they would not likely be measurable, it would be helpful to clarify whether or not this same logic might then apply to fishery interactions for such far-ranging individual(s) (note recent sighting of a southern sea otter off Mission Bay San Diego).	We do not attempt to quantify fishery interactions with far-ranging sea otter individuals.
74	P. 118, Table 6-18 Based on recent results from a multi-year white seabass archival tagging study being conducted by the Pfleger Institute of Environmental Research (PIER), there is evidence that the commercial harvest of white seabass has a significant component taken north of the areas listed in Table 6-18.	The area that may potentially be affected by the alternatives under consideration is Southern California Bight. Although white seabass landings to the north of Point Conception may ultimately dampen potential effects on the white seabass fishery in the Southern California Bight, we do not include these landings in our estimation of percent effects on the fishery.
75	P. 92 I am concerned with the language in this section of the RDSEIS. It describes minimum and maximum impacts on gillnet fisheries for halibut and white sea bass. There is no mention of the Service's	Our analysis of effects on these fisheries in the RDSEIS/FSEIS presents a low estimate (no additional closure) and a high estimate (immediate closure of the area to 104 m (341 ft)). Our rationale for

	position on the preferred regulatory needs if there are no sea otters in the described area, from Santa Barbara to Port Hueneme outside of 3 miles to 104 meters. Currently there are NO sea otters in this zone and it is unknown when and if the otters will migrate that far offshore. In a recent meeting between Santa Barbara and Ventura commercial fishermen and the Service, this issue was discussed. The consensus among fishermen and Service representatives was that there was no need to close the gillnet fisheries if no sea otters are present. We all agreed that an environment 3 to 8 miles offshore with primarily a mud bottom was not prime sea otter habitat. I request an amendment to the preferred alternative that states that, while protecting sea otters, every reasonable effort also is made to protect legal commercial fisheries that currently have no impact on sea otter recovery. I also suggest that, although it is very unlikely that an interaction would occur with the fisheries, there should be some provision to employ adaptive management. This would probably also apply to other interests, including harbor districts, municipalities, the oil industry, the military and even the Service. In light of the consensus reached at the recent meeting in Ventura, we would appreciate the Service statement, for the record, that it is not their intention to recommend that CDFG close otherwise legal commercial fisheries if they have no impact on the recovery of southern sea otters. This statement should specifically list the halibut and white sea bass gillnet fisheries in the described zone between Santa Barbara and Port Hueneme from 3 miles offshore to 104 meters.	choosing 104 m (341 ft) as the maximum depth to which a gill and trammel net gear closure could be extended is explained in section 6.2.4.6 of the RDSEIS. Our intention here is not to advocate for such a closure but to disclose the maximum potential effect on these fisheries, while also acknowledging that this effect might not occur at all. We do not advocate any additional gill and trammel net closures in areas where sea otters do not yet occur.
76	I am also concerned with language in the RDSEIS, section 6.7.4.5.1, which states, "Under Alternative 3C the regulatory environment would change (see section 6.7.12). The area from Point Conception to the Mexican border would become subject to the regulations currently in effect throughout the remainder of the southern sea otters range." The same language is used again in subsection 6.7.4.5.2 on page 259. The use of the word would, connoting an absolute, does not allow for adaptive management and the ability to allow otherwise legal commercial fisheries to continue when they currently have no impact on southern sea otters. It requires that the same depth regulations be enforced as now implemented on the central coast, an area that is characterized by a completely different environment.	The regulations we refer to are those that define the regulatory status of sea otters in the Southern California Bight. Incidental take exemptions under the ESA and MMPA would no longer apply if the translocation program and its associated management and translocation zones were terminated. We are not referring to regulations pertaining to fishing restrictions. We do not have the authority to regulate the fisheries analyzed in the RDSEIS and are not proposing any changes to fishery regulations under any of the alternatives under consideration (see Chapter 3 for a full discussion of these alternatives). See also our responses to comments 54, 55, 57, 59.

77	If these commercial fishing vessels were regulated out of business unnecessarily, an important asset would be lost in the event of an oil spill. Many of the gillnet vessels are members of F.O.R.T, the Fishermen's Oil Response Team, based in Carpinteria. As demonstrated in the gulf oil spill, fishing vessels made an important part of oil spill cleanup efforts.	We acknowledge the contribution of fishing vessels to oil spill cleanup efforts.
78	In 1998, 100 sea otters entered the management zone in northern Santa Barbara County, south of Point Conception. This was not supposed to happen. The U.S. Congress should reallocate a significant portion of the Service budget to reimburse coastal communities for their financial losses due to the Service's willful neglect. The loss of the Cojo Anchorage in Northern Santa Barbara County has cost an annual $2.2 million (ex-vessel) in abalone, sea urchin, crab and lobster landings. Over 13 years, this is approximately $68 million in ex-vessel landings.	According to our analysis, suspension of containment has thus far resulted in limited impacts on shellfish fisheries along the coastline near Point Conception. We note that the commercial abalone fishery was closed throughout California in 1997, prior to the natural range expansion of sea otters into the Cojo Anchorage area. The decrease in landings attributed to sea otter predation, and the expected benefits to commercial fisheries of resuming enforcement of the management zone, are summarized in Tables 6-29 and 6-30, 6-34 and 6-35, 6-39 and 6-40, and 6-44 and 6-45 of the RDSEIS/FSEIS for commercial sea urchin, lobster, crab, and sea cucumber fisheries, respectively. Section 6.3.4 of the RDSEIS/FSEIS describes the method by which these impacts were estimated. The analysis presents landings data from 1986-2009 to illustrate trends, but in order to isolate the effects of sea otter predation, the analysis compares landings for the year immediately preceding occupation of the Cojo Anchorage area by large numbers of sea otters to landings in subsequent years. Whereas fluctuations in landings are a function of many factors, including but not limited to population variation, weather fluctuations, and market demand, the analysis conservatively assumes that any losses in landings are due only to sea otter predation or to the effects of the 1997-1998 El Niño event. The Service believes that this approach conservatively captures (that is, it may overestimate) the effects of sea otter predation on fisheries thus far in areas within the management zone.
79	The State of California is in the process of establishing MPAs with the intention of enhancing marine fisheries. Much of this enhancement would be eliminated should sea otters be allowed to enter them. Fanshawe *et al.* (2003) state: "We conclude that the coastal marine protected areas off California cannot enhance abalone fisheries if, in the interest of ecosystem integrity, they also contain sea otters."	Section 6.2.11.4 of the RDSEIS/FSEIS cites the Fanshawe *et al.* (2003) study and addresses the potential effects that sea otters could have on the goals identified for MPAs, including the goal that relates to the enhancement of fisheries.
80	As a restaurant, and Fish Market owner, we depend a great deal on locally caught seafood. We have	Thank you for your comment. It has been noted and will be included in the administrative record for this

	been in business for 26 years, and in those years have taken great pride in educating our consumers about the benefits of consuming local seafood. If the local gill and trammel net fishery is affected, our business would suffer a great deal. In speaking with many of the local fisherman, they have expressed the fact that they have no interaction with the sea otter. Therefore, no matter which of the options are considered, under no circumstance should the gill net fishery be affected. I believe that the sea otter should be protected, but certainly not at the expense of hurting a much needed local fishing fleet.	action.
81	A 2005 report by Dr. John Loomis (Loomis Report) developed estimates of tourism, ecosystem and existence-bequest benefits resulting from an expanded range for southern sea otters into historically occupied habitat off the coast of Santa Barbara and Ventura Counties in southern California. The Loomis Report has been reaffirmed for purposes of these comments. The economic analysis shows that substantial economic benefits can be gained from allowing sea otters to naturally expand their range into areas off the southern California coast. The Loomis Report concludes that if, "in fact, the final Supplemental Environmental Impact Statement on the Southern Sea Otter Translocation Program allows for unlimited population growth, eventual expansion of southern sea otter populations and range would provide more than $100 million in annual economic benefits to California households." In addition, the report concludes that, "expansion of southern sea otter populations along the Santa Barbara coast would result in at least $1.5 million in direct tourism income related to sea otters to a best estimate of $8.2 million annually in Santa Barbara and Ventura counties from the initial expansion of sea otter populations reported by the Service. These direct income effects do not reflect any multiplier effects, consideration of which may double these direct income estimates." In an updated memorandum, Dr. Loomis's overall conclusion in the 2005 report would still hold true with the new information contained in the 2011 RDSEIS. His specific conclusions are from the 2011 memorandum are: • The non-market values of southern sea otters (median value of $21 million for 196 sea otters) determined for the 2005 report is very similar to the Service's estimated range of $13.2 to $32.5, where their large	The RDSEIS/FSEIS incorporates some but not all of the information included in the Loomis report. We address the major points of the report in turn. The Loomis report develops estimates of economic benefit due to the presence of sea otters based on expected increases in tourism and non-market economic benefits. The RDSEIS/FSEIS accounts for potential non-market values due to an increasing population of sea otters. However, we have not incorporated the estimated benefits due to increases in tourism proposed by Loomis because the tourism market in Santa Barbara appears to be saturated, and tourist vessels appear to be limited by available space in Santa Barbara harbor. Therefore, there would not necessarily be increased economic activity in the tourism market. Multiplier effects are not used because new tourism expenditures are not expected to occur within 10 years. The Loomis report also proposes a figure for the value of the ecosystem services provided by kelp forests. The report states that if the relationship between the presence of sea otters in southern California and increased kelp abundance can be quantified, then the value of the presence of sea otters in terms of ecosystem services can be quantified. Because there are no empirical studies that quantify this relationship for southern California waters, we do not attempt to quantify the economic value of ecosystem services provided by sea otters. However, our discussion of sea otter effects on the nearshore marine ecosystem (see section 6.2.2) acknowledges the indirect benefits afforded by kelp forests, including reduced coastal erosion. Finally, the report notes that ex-vessel value overestimates the value of commercial fishing to anglers because it fails to account for the savings in boat fuel and labor that could be reemployed

	range is based on 176 to 402 sea otters. • Comparison of either the 2005 report's median non-market value of $21 million to the Service's $13.2 to $32.5 non-market value of sea otters in the No Action Alternative and Alternative 3C (FWS Preferred Alternative) to the Service's new estimate of possible gains in commercial fisheries ($1 million annually for Alternative 1) indicates that the nonmarket value of sea otters that would be lost with Alternative 1 exceeds the gain in commercial fishing values. • The very conservative estimates of direct income gained from southern sea otter tourism of $1.5 million in direct income and 62 direct tourism jobs are feasible to attain in the Santa Barbara area in the next decade. The report from University of California Santa Barbara suggested much higher estimates (as much as 326 tourism jobs with 117 sea otters in the Santa Barbara area) which could be attained in the future than what the 2005 report estimated as a lower bound. • This lower bound, direct tourism-based income of $1.5 million is also larger than the potential gains from commercial fishing in Alternative 1. The fisheries should be viewed as a "portfolio," with the recognition that some fisheries may decrease, but the overall vitality of the fisheries will remain constant.	elsewhere if commercial fishing activity were reduced. Section 4.4.2.1 of the RDSEIS/FSEIS acknowledges this source of overestimation.
82	The adverse effects on fisheries are overstated and are based on incorrect assumptions. Projections indicate that having southern sea otters reoccupy areas south of Point Conception will, over time, compromise the viability of the urchin fishery. However, the rate of decline in the fishery will likely be slow and sporadic, and urchin fishers will have the opportunity to operate in other areas that remain unoccupied by sea otters for several years or perhaps decades. In addition, the sea urchin fishery shows declining landings over the past twenty years, a time when southern sea otters have not inhabited fishery areas (see graph)—a circumstance that might suggest that overharvesting and poor management of this relatively short-lived fishery has had a far greater impact on urchin recruitment and the ability of the fishery to sustain itself.	Baseline assumptions for impacts to fisheries are given in section 6.2.4.1 of the RDSEIS/FSEIS. Our assumption that sea otters will eliminate fisheries for sea urchins, lobsters, crabs, and sea cucumbers is based in part on data on proportional prey consumption by sea otters in southern California (see section 4.3.1.2) and in part on past interactions between sea otters and shellfish fisheries along the central coast (Estes and VanBlaricom 1985). Based on recent observations of proportional prey consumption by sea otters at San Nicolas Island (Bentall 2005), it is probable that sea urchin fisheries will be more heavily impacted than crab or lobster fisheries. However, because we lack data on absolute abundance of the prey species in question and the level at which fisheries for lobsters, crabs, and sea cucumbers would become inviable, we conservatively assume that these fisheries cannot coexist with sea otters once an area of range has

		been fully reclaimed. Although effects may be overestimated, we believe they represent a reasonable upper bound of effects and are sufficient to inform our decisionmaking. We analyze effects on the sea urchin fishery in sections 6.2.4.2, 6.3.4.2, 6.4.4.2, 6.5.4.2, 6.6.4.2, and 6.7.4.2 of the RDSEIS/FSEIS. Over the next 10 years, natural sea otter range expansion under the baseline (as well as under the preferred alternative) is expected to affect a limited portion of the sea urchin fishery in the Southern California Bight, resulting in a 3 percent decrease in landings relative to the Southern California Bight as a whole.
83	With regard to fisheries, CDFG is concerned that the document places significant emphasis on fisheries issues, while in our view, addressing possible fishery impacts is just one among many possible actions the Service might consider. Furthermore, attempts to make general characterizations about fisheries in some cases may overstate the possible extent of fisheries impacts, or take the impacts out of context. For example, the analysis in the document relies heavily on information regarding otter-gear interactions from the central California gill net fishery, but yet no differentiation was made between the type, location (*i.e.,* adjacent kelp beds), and depths where those nets were set and the very different biogeographical environment of southern California where the gill net fisheries remain active. While sea otter-gill net gear conflicts are possible once the sea otters expand further down the coast in southern California, until there is some evidence of a problem, fisheries management actions are premature. The vast majority of sea otters forage in nearshore areas at depths of 40 meters or less. Since passage of the Marine Resources Protection Act of 1990, gill netting within three miles of shore or within one mile of the Channel Islands has been prohibited, meaning it is illegal to gill net in most nearshore waters off California. Given that otters appear to favor food-rich, nearshore kelp environments, it seems unlikely that otters would venture out to areas beyond three miles and to sand/mud substrates where gill netting might occur. So while the document indicates that only one percent of the sea otter population might dive to depths where the State's gill net fisheries are conducted (RDSEIS, p. 111), CDFG expects an interaction rate of far less than one percent in the gill net fisheries given the location, substrate, and extent of gill net fishing areas.	We place significant emphasis on fisheries issues because these issues were highlighted during scoping and in extensive comments on the 2005 DSEIS. We describe potential effects on fisheries that may occur as a result of our action. We do not have the authority to regulate the fisheries analyzed in the RDSEIS are not proposing any changes to fishery regulations under any of the alternatives under consideration (see Chapter 3 for a full discussion of these alternatives). Our analysis of potential effects on gill and trammel net fisheries in the RDSEIS was added specifically in response to comments we received on the 2005 DSEIS, which did not anticipate any effects on gill and trammel net fisheries. The comments stated that we had neglected to analyze potential effects of our proposed action on gill and trammel net fisheries, specifically the halibut and white seabass fisheries. These effects could occur as an indirect consequence of regulatory changes pertaining to sea otters that would occur under Alternatives 3A-3C. Our analysis of effects on these fisheries in the RDSEIS presents a low estimate (no additional closure imposed by the State) and a high estimate (immediate closure of the area to 104 m (341 ft)). Our rationale for choosing 104 m (341 ft) as the maximum depth to which a gill and trammel net gear closure could be extended is explained in section 6.2.4.6 of the RDSEIS. Our intention here is not to advocate for such a closure but to disclose the maximum potential effect on these fisheries, while also acknowledging that this effect might not occur at all.

84	The document states that, as a way of mitigating otter-gear conflicts, the Service would work with CDFG and fishermen to develop fishery management strategies that could include retiring permits. In the past, fishermen have had their permits bought by the Federal government and even private nonprofit organizations in order to advance environmental goals. However, CDFG would need to carefully consider other fishery management goals, objectives, existing laws and internal resources before determining whether to engage with the Service in such a scoping process.	We acknowledge that the Service does not have the authority to regulate fisheries and that CDFG would have to consider any such strategy carefully before engaging the Service in discussion. As a result, we have removed the suggested mitigation measure. However, we remain committed to working cooperatively with CDFG and NMFS (as these agencies deem appropriate and feasible) and affected fishers to explore possible fishery management strategies that would minimize the effects of Alternatives 3A, 3B, or 3C, if selected, on individuals in the affected fisheries.
85	The document presumes that CDFG has the discretionary authority to close gillnet and trap fisheries operating off the coast of California. Although these fisheries primarily target State-managed species, some gill net and trap fisheries occur in Federal waters and in some cases target species of groundfish managed under the Federal Groundfish Fishery Management Plan and regulations adopted by the Secretary of Commerce. This raises a classic problem in Federal-State conflict of law. (See, i.e. *Vietnamese Fishermen Association of America v. California Department of Fish and Game* (1993) 816 F. Supp. 1468 [State Marine Resources Protection Act gill net ban preempted by Federal law]. As of November 2000, CDFG has been permanently enjoined from enforcing the gill net prohibitions in Federal waters at the Huntington Flats. Although that injunction pertains specifically to Fish and Game Code sections 8610.4 and 8693(b), a similar outcome could be expected here unless Federal law is first changed to allow the State to make that conforming change (see Fish and Game Code section 7652).	We are unable to predict the outcome of a federal-state conflict of law regarding the authority of CDFG to close fisheries operating off the coast of California in federal waters. Therefore, we have changed text in our discussion of potential effects on gill and trammel net fisheries throughout the FSEIS and in the Final Rule to reflect this uncertainty regarding the appropriate regulating authority.
86	P. 24, Table 3.1 The mitigation measure for the last 3 alternatives states: "Work with CDFG to develop a fishery management plan for affected fisheries to minimize effects of sea otter range expansion on individual fishers." A Fisheries Management Plan (FMP) currently exists for white sea bass, and CDFG has started work on a spiny lobster FMP. FMPs are multi-year projects that are labor intensive, have an extensive public and scientific review process, and cost several million dollars each. It is highly unlikely the Service would be providing CDFG with sufficient funding and staff to develop an FMP. FMPs evaluate individual species or an ecosystem (or network of species), but it is unlikely that a single FMP can be developed to collectively manage all fisheries that might possibly interact with sea otters. In this light, we suggest this	We have removed the suggested mitigation measure. However, we remain committed to working cooperatively with CDFG and NMFS (as these agencies deem appropriate and feasible) and affected fishers to explore possible fishery management strategies that would minimize the effects of Alternatives 3A, 3B, or 3C, if selected, on individuals in the affected fisheries.

	mitigation measure be reconsidered.	
	Incidental Take	
87	If the only acceptable number of sea otter 'takes' is zero, the Service should be addressing other, non-fishery, impacts, such as propeller strikes.	Termination of the translocation program would result in the removal of all associated regulatory provisions, such as the exemption from the incidental take prohibitions of the ESA and the MMPA for activities within the management zone. Allowable incidental take of sea otters in southern California commercial fisheries would then be zero, as it is throughout the remainder of the southern sea otter's range, because such take cannot be authorized under section 118 of the Marine Mammal Protection Act. Boat strikes remain a low but persistent source of sea otter mortality. Many such strikes appear to occur as boats exit harbors. We continue to work with enforcement authorities to ensure compliance with speed limits in and near harbors.
88	The Service does not adequately present the importance of the Navy agreeing to have sea otters translocated to San Nicolas provided the Navy was given exemption from ESA and MMP A requirements.	We have added statements to sections 4.4.9.5 and 6.2.11.5 of the FSEIS indicating that the Navy agreed to allow sea otters to be translocated to San Nicolas Island provided it was given an exemption from ESA and MMPA requirements for southern sea otters. However, we note that the MMPA exemption applies only to the management zone, not the translocation zone. Our observations of the colony to date suggest that the presence of southern sea otters at San Nicolas Island is compatible with Naval operations. We appreciate the Navy's cooperation in establishing and implementing the translocation program and the Navy's continuing contribution to southern sea otter recovery efforts.
89	Throughout the document when impacts to the Navy are discussed, the document repeatedly states that impacts to the Navy can be resolved by simple programmatic consultations. It should be stated in the document that that option may be unfeasible, as the Navy cannot foresee all future program requirements (such as what new technologies may be tested, what new weapons systems may be tested, what types of operations and training may be utilized in the future, *etc.*). Therefore, the Navy will not be able to provide the Service or NMFS with the amount of information they require to analyze impacts and do a one-time programmatic consultation. As a result, multiple consultations with the Service and NMFS would be required as new program requirements are developed.	We have made the requested clarification. Although we acknowledge that more than one programmatic consultation may be required over time, we continue to believe that programmatic consultations are a feasible means of reducing the regulatory burden on the Navy associated with ESA compliance with respect to sea otters. For instance, the Navy currently has a programmatic consultation with the Service for terrestrial species at San Nicolas Island (based on their Integrated Natural Resources Management Plan) and a programmatic consultation for species on San Clemente Island for Military Operations and Fire Management. While the Navy may not now be able to foresee all future program requirements, we assume that sufficient information will be available prior to implementation of future programs to enable meaningful programmatic consultation.

		We note that there are currently no ESA or MMPA exemptions associated with the management zone or translocation zone for species under the jurisdiction of NMFS. Therefore, termination of the translocation program would not affect the Navy's obligations with respect to species under NMFS jurisdiction.
90	The Service states, "To mitigate regulatory effects that may occur as a result of this alternative, if chosen, we are working with the Department of Defense to identify possible mutually agreeable solutions." Navy appreciates this acknowledgment of impacts to the Department of Defense and will continue to work with the Service to determine mutually agreeable solutions.	The Service appreciates the Navy's willingness to coordinate with us on recovery efforts for listed species, including the southern sea otter.
91	The impacts upon the Navy of alternatives 3A, 3B, and 3C are not the same. While the Service notes that it is an assumption that otters will return to SNI, the effects of 3A and 3B differ from the effects of 3C in that initially otters would not be present on SNI and that some, potentially large, amount of time would pass prior to recolonization. Thus, the impact of 3C would be immediate, as opposed to the presumed impact of 3A and 3B, which would occur later if at all.	Because many sea otters returned to the mainland range immediately after being translocated to San Nicolas Island, it is reasonable to assume that some sea otters would also return to San Nicolas Island immediately after removal under Alternatives 3A and 3B. While the colony would likely be greatly reduced in number, at least initially, the regulatory requirements would be the same, irrespective of the number of sea otters. However, we have clarified the discussion of regulatory impacts under 3A and 3B to account for the possibility that none would return or that there would be a delay before one or more returned.
92	The RDSEIS states that the proposed action would reduce incidental take permits for southern sea otters in the management zone and the translocation zone. These actions will lead to an increase in the southern sea otter population. Given that Alternative 3C does not cause any negative impacts compared to the baseline scenario (no action), this alternative would generate net benefits compared to the baseline scenario. The potential magnitude of these benefits, at least those associated with potential increases in southern sea otter populations (*e.g.,* tourism and non-use values), should be indicated, because relevant estimates are available from the Loomis Report.	The RDSEIS does not state that incidental take permits for sea otters would decline under Alternative 3C. Under current regulatory conditions, incidental take permits are not required for otherwise legal activities that may affect sea otters in the management zone. Therefore, under Alternative 3C, the number of incidental take permits issued for actions affecting sea otters in the area currently designated as a management zone cannot decrease (it is currently zero). If otherwise legally allowed, incidental take permits could be issued under Alternative 3C. However, because there are presently relatively few sea otters in the areas designated as a management zone, and incidental takes are not currently known to be occurring there, any benefit to sea otters would be speculative. At most, we would expect a beneficial effect of low significance within 10 years (defined as an effect on some individuals but no effect at the local population level). However, as indicated above, this benefit is speculative, in that it will not occur if sea otters are not being incidentally taken. Even if incidental take were to occur in the future, the benefit of increased regulatory protections

		would be realized by sea otters only if the incidental take were 1) detected and 2) prevented or minimized by means of measures included in incidental take authorizations. In response to this comment, we have clarified our discussion of the potential effects on sea otters of the regulatory changes that would occur under Alternatives 3A-3C in the FSEIS.
92.5	There is flexibility under Section 10(j) of the ESA. If the Service chose to look at that flexibility, it could buy fishermen some time. Once sea otters are delisted, we lose all authority under 10(j) because they are removed from the ESA and move over to the MMPA, and there is no flexibility under the MMPA for take.	The southern sea otter is federally listed as a threatened species under the ESA, and is therefore considered a depleted species under the MMPA. The state of California additionally recognizes the southern sea otter as a fully protected mammal in Fish and Game Code section 4700 and as a protected marine mammal in Fish and Game Code section 4500. Among other restrictions, "take" of southern sea otters is prohibited under each of these laws. Sea otters translocated to San Nicolas Island were designated as "experimental" but not "non-essential" under Public Law 99-625, not Section 10(j) of the ESA. In the RDSEIS/FSEIS we consider a "No Action" alternative and the following additional alternatives: resume implementation of the translocation program (Alternative 1), modify it (Alternative 2), or terminate it (Alternatives 3A-3C). If the translocation program were declared a failure and terminated, the management and translocation zones would be abolished, and the provisions of Public Law 99-625 would become inoperative. California Fish and Game Code section 8664.2 would also become inoperative. As a result, all activities that may affect southern sea otters within the Southern California Bight would be fully subject to the ESA, the MMPA, and California state law, including applicable consultation requirements and take prohibitions under these laws. See also our responses to comments 3, 93, and 93.5.
93	The Service should work with fishermen to provide incidental catch authorization for sea otters as is available for other marine mammals.	Section 118 of the MMPA, which governs the incidental taking of marine mammals in the course of commercial fishing operations, does not apply to southern sea otters. Section 118 of the MMPA would need to be amended before the incidental taking of southern sea otters in commercial fisheries could be authorized.
93.5	Calling the translocation a failure is not a good idea. There is flexibility that will be lost if you remove the experimental population status. There are other problems in Southern California that otters could run into that you might want to have the flexibility to move otters because of—whether that's going into the back harbor of L.A. and getting into trouble with some sort of pollution problems	The commenter suggests that we maintain the status quo in order to preserve incidental take exemptions associated with the management zone and suggests, further, that this approach would give the Service the flexibility to move sea otters selectively. However, continuing to maintain the status quo (as reflected in the No Action Alternative) does not appear to be a viable alternative. See our

	or sea otters moving out to Cortes Bank and starting to impact white abalone.	response to comment 3. We note that under the ESA, sea otters with full "threatened" status (which would be the case if the translocation program were terminated), may be intentionally "taken" (*i.e.,* captured) by appropriate authorities for their own protection (such as in the event of a live stranding or an oil spill). We also note the current take exemption for sea otters in the management zone is limited to *incidental* take; the exemption does not extend to *intentional* take of sea otters for their own protection or for any other purpose. Thus, maintenance of the translocation program does not affect the Service's flexibility to intentionally take (*i.e.,* capture) sea otters for their own protection or for other authorized purposes.
	Failure Determination	
94	The Service is basing its failure determination on Criterion 2. However, it is difficult to understand how the failure criteria have been met. There are now 50+ sea otters on the island, and the population has been growing at an average of 7 percent per year. The Service's determination that the translocation program has failed is a political construct. Given that the 1930s Big Sur population of 40-50 otters was the source of the 2,800 sea otters currently in the mainland range, it is obvious that the San Nicolas population could serve the same function if necessary after a large oil spill. As such, the translocation program is not a failure under the intent of Public Law 99-625.	Public Law 99-225 did not address the prospect of the program's failure. The failure criteria were established at the inception of the translocation program based on the scientific judgment of the agency biologists who designed the program. These criteria are codified at 50 CFR 17.84(d) in the rule implementing the translocation program. The final translocation program evaluation assesses the program in relation to the objectives for which it was undertaken and the specific regulatory failure criteria at 50 CFR 17.84(d)(8). In that evaluation, we conclude that the translocation program has failed to fulfill its primary purpose as a recovery action and that, as measured against the specific regulatory failure criteria governing the translocation program, the program has failed under Criterion 2. Under Criterion 2, the count of southern sea otters at San Nicolas Island is based on the number present within 3 years from the initial transplant—not on the number present as of 2012, 25 years after the initial transplant. The initial high rate of dispersal of translocated sea otters from San Nicolas Island is the primary cause of failure under Criterion 2 not only because of its direct effect on the subsequent size of the San Nicolas Island colony, but also because of its implications for the recovery strategy at the heart of the program: the intended function of the San Nicolas Island population as a self-sustaining "reserve colony for providing stock to restore subsequently damaged areas" in the southern sea otter's range (52 FR 29754; August 11, 1987). The high rate of dispersal of translocated sea otters suggests it is unlikely that the colony will ever be large enough to supply the numbers of sea otters necessary to perform a successful translocation and

		re-establishment of population in the mainland range if the parent population were reduced or eliminated by a catastrophic event. The translocation program has not achieved its primary recovery goal of producing a second, self-sustaining population of sea otters that could produce sufficient numbers of sea otters to repopulate the mainland range in the event of catastrophic mortality. The fact that a remnant population of southern sea otters numbering approximately 50 animals in 1914 (Bryant 1915) grew over the course of nearly a century in essentially unrestricted habitat to the current mainland population size of 2,711 animals (in 2010) does not contradict our finding that the translocation program has failed. Rather, it emphasizes the precariousness of both the mainland population and the San Nicolas Island colony and the need for continued range expansion. It should be noted that, based in part on data gained while implementing the translocation program, the recovery strategy has fundamentally changed. The revised recovery plan recommends against additional translocations and instead advocates allowing natural range expansion (USFWS 2003).
95	Implementing regulations for the translocation program (52 FR 29754; August 11, 1987) state that the Service must conduct a full evaluation into the probable causes of failure prior to declaring the translocation a failure. If the causes can be determined and if legal, reasonable remedial measures can be identified and implemented, then consideration is to be given to continuing to maintain the translocated population. Evaluation of the program's failure has not been conducted in accordance with the regulations. There are several theories for sea otter mortality and fecundity that have not been considered in the analysis, and an investigation of alternative implementation methods that would maintain the translocated population has not been adequately conducted. Finally, there has been no real consideration of maintaining portions of the program. If capturing and relocating otters has negative effects, consideration should be given to terminating only those portions of the program.	We describe our efforts to determine and remedy the causes of failure in our translocation program evaluation (included as Appendix C to the RDSEIS/FSEIS). We have concluded that the translocation program has failed under Criterion 2. We believe that emigration from SNI is the primary reason that substantially fewer than 25 otters remained in the translocation zone within three years of the initial transplant. We do not agree that we have failed to give adequate consideration to remedial measures that would enable continuation of the translocation program. Although we modified the program significantly after the first year in an attempt to reduce emigration and otherwise reduce sea otter mortality associated with the program, we were unable to remedy the situation. Therefore, failure Criterion 2 has been met. The translocation program evaluation (Appendix C to the RDSEIS/FSEIS) discusses the translocation and containment results, including remedial efforts undertaken to address program implementation concerns, and their relationship to the failure criteria in detail.

		We are unable to address the commenter's assertion that there are "several theories for sea otter mortality and fecundity that have not been considered in the analysis" because the commenter does not identify or describe these theories. Because translocation and containment are integral, required components of the translocation program under the authorizing legislation, the program, if it were to continue, could not continue without both components.
96	The proposed rule states that the "experimental population has fluctuated in number since 1993, and now appears to be increasing overall." This statement is misleading and does not adequately represent the population's present status. Three-year average counts (used statewide to estimate otter abundance) have increased every year on SNI since 1997, with the exception of one year where the three-year average dropped by less than 0.5 otters (2005). This is not a fluctuating population, but rather an increasing population, with the 2011 count reaching 54 otters and pups.	Different methodologies are used for the counts along the mainland and at San Nicolas Island. Three-year running averages based on an annual census are not used to characterize population trends at San Nicolas Island as they are for the mainland population. Because it is a small island with a limited coastline, counts are conducted there quarterly, and the high quarterly count is adopted as the official count for the year. The high count for 2011 was 48 independent sea otters plus 5 pups. Although on average the San Nicolas Island colony has been growing at an annual rate of approximately 7 percent since its low point in 1993, this rate has been variable from year to year. Specifically, the number of independent (non-pup) sea otters at San Nicolas Island decreased (relative to the previous year's count) in 1995, 1997, 1998, 2004, 2005, and 2009. Therefore, we do not believe the statement is misleading, and we have retained the original language.
97	The translocation has not failed. Instead, the Fish and Wildlife Service had unrealistic expectations for when certain milestones would be reached. Indeed, the RDSEIS admits the Service's expectations were unrealistic and further admits that the translocation population is a successfully reproducing population in terms of numbers and growth. Rather than recognize these data and reevaluate the Service's original expectations, the Service has chosen to declare the translocation a failure. To reach that conclusion, the Service has ignored the best scientific data available and has used evaluation standards found nowhere in the existing regulations. The Service has simply minted new standards to evaluate the translocation without complying with the Administrative Procedure Act.	The translocation program evaluation (Appendix C to the RDSEIS/FSEIS) assesses the program in relation to the objectives for which it was undertaken and the specific regulatory failure criteria contained in the rule at 50 CFR 17.84(d) that established the translocation program. We have concluded that the translocation program has failed to fulfill its primary purpose as a recovery action. Additionally, in our formal review of the program, we have determined that the program has failed under Criterion 2 of the specific regulatory failure criteria at 50 CFR 17.84(d)(8). Thus the commenter is incorrect in asserting that we relied on new evaluation standards not found in the regulations. It is the commenter who appears to suggest that we should disregard the regulatory failure criteria, stating that "the Fish and Wildlife Service had unrealistic expectations for when certain milestones would be reached…and should reevaluate [its] expectations." See also our response to comment 94.

98	The potential for a catastrophic spill of the same magnitude of the Exxon Valdez was present when the translocation was planned and implemented. Then, it was not perceived as a problem. Then, the establishment of the San Nicolas Island population was "essential" for sea otter recovery. Today, with no change in the size of a potential spill, but with the addition of new and improved navigation and safety programs, the Service claims a sudden and new awareness of the threat of an oil spill, and the San Nicolas Island translocation is somehow a failure. If the translocation is a failure because it is within the range of a catastrophic oil spill, then so too is the preferred alternative of range expansion. The Service cannot use the catastrophic oil spill scenario to declare translocation a failure without simultaneously admitting the preferred alternative cannot meet its objective. The Service is using a fatally flawed double standard to declare translocation a failure.	Our conclusion that the program has failed is based on our analysis of the regulatory failure criteria in 50 CFR 17.84(d)(8). We determined that the program has failed under Criterion 2. We did not conclude—contrary to the commenter's assertion—that the translocation program failed because the population of southern sea otters at San Nicolas Island is within the range of a potential catastrophic oil spill. However, our evaluation of the translocation program does recognize that although the potential for a spill of the magnitude of the *Exxon Valdez* disaster may have existed when the translocation program was initiated, that risk was not adequately appreciated. Our experience until then had led us to expect that San Nicolas Island was sufficiently distant from the mainland population to serve as a reasonable safeguard for sea otters in the event of an oil spill. The *Exxon Valdez* spill demonstrated (and the Deepwater Horizon spill further demonstrated) that this is not the case. The evaluation of the translocation program thus acknowledges that not only is the San Nicolas Island population too small to produce sufficient numbers of sea otters to repopulate the mainland range in the event of catastrophic mortality, but that San Nicolas Island is not sufficiently distant from the mainland range to insulate the San Nicolas population from the effects of a catastrophic oil spill within the mainland range. Our evaluation of the translocation program also recognizes that containment was far more difficult to achieve than expected and that the recovery strategy for southern sea otters has fundamentally changed (USFWS 2003), such that we now recognize that allowing southern sea otters to naturally expand their range is key to the future recovery of the species. In summary, we have concluded that the translocation program has met failure Criterion 2 and that the overarching recovery goal of the program—the establishment of a distant population of southern sea otters at San Nicolas Island to provide a source population of sea otters should the mainland population experience catastrophic mortality—cannot be achieved because 1) the population at San Nicolas Island is much too small to provide an adequate source population of sea otters, 2) even if the San Nicolas Island population were to eventually become "established," a substantial number of sea otters translocated to the parent range would likely emigrate back to the island and thus not repopulate the parent range; and 3) the San Nicolas Island population is not sufficiently distant from the parent population to be

		insulated from the effects of a catastrophic oil spill. In addition, artificially restricting natural range of southern sea otters through containment—a required component of the translocation program—is not only detrimental to the recovery of the species but, if resumed, is likely to jeopardize the continued existence of the species in violation of the ESA.
99	The second underlying basis for the Service's decision to declare translocation a failure is the assertion that the San Nicolas Island population is small and its future uncertain. That is far different than saying the San Nicolas Island population is still not critical to the recovery of southern sea otters. The fact that the Service's preferred alternative is to leave the sea otters at San Nicolas Island, even after declaring the translocated population a failure, proves that the translocation did not fail and that the San Nicolas Island population is important for sea otter recovery.	The translocation program evaluation (Appendix C to the RDSEIS/FSEIS) assesses the program in relation to the objectives for which it was undertaken and the specific regulatory failure criteria provided in the rule at 50 CFR 17.84(d) that established the translocation program. We have determined that program has failed under Criterion 2. We have also concluded that the translocation program has failed to fulfill its primary purpose as a recovery action and noted that the San Nicolas Island population remains small, its future is uncertain, and it is unlikely that it will be ever be able to produce sufficient numbers of sea otters to repopulate the mainland range in the event of catastrophic mortality, which was the primary recovery goal of the translocation program. This conclusion does not mean that the San Nicolas population of southern sea otters is unimportant or that its removal from San Nicolas Island would not result in adverse consequences. Indeed, the Service's preferred alternative, to declare the program a failure but to retain sea otters at San Nicolas Island, is based in part on the recognition that if sea otters were removed from the island, some would return, some would die, and the introduction of these sea otters into the mainland population would likely further stress that food-limited population. Our recognition of the value of maintaining in place the small but stable San Nicolas population, which is reflected in the preferred alternative, does not mean that the translocation has been successful as evaluated against the specific regulatory failure criteria in 50 CFR 17.84(d)(8) or against the overarching recovery goals of the translocation program. As we explain in detail in the translocation program evaluation, the program has failed under both measurements. See also our response to comment 98.
100	The intent of the translocation program was to establish a breeding nucleus of 70 sea otters. That 70 would expand into an established population of 150. To achieve the breeding nucleus, the plan was to translocate 70 sea otters in the first year of the program. That number would be supplemented with up to 70 sea otters annually, to a total of 250	The translocation program evaluation (Appendix C to the RDSEIS/FSEIS) assesses the program in relation to the objectives for which it was undertaken and the specific regulatory failure criteria given in the rule at 50 CFR 17.84(d) that established the translocation program. We have determined that the program has failed under

	that could be moved. However, the Service translocated only 140 sea otters between 1987 and 1990, 56 percent of the 250 originally planned to be part of the translocation. Given that the Service stopped the actual translocation at just over 50 percent of the original objective, it is arbitrary and capricious to judge success of the current population level at San Nicolas Island based on the original assumptions about when and how population levels would be achieved if 250 sea otters were translocated. Since the Service elected to implement only half of the translocation program, transferring to San Nicolas Island only about half of the number allowed to be placed there, the actual standard should not be 25. It is only half of that, in which case Criterion 2 is not met because within three years of the initial transplant 17 sea otters were at the Island. If the full translocation program had been implemented, it is reasonable to assume we would now have a breeding nucleus of 70 animals and would be moving toward the population level of 150. At the current reproduction rate, which is approximately 10 percent annually, the San Nicolas Island population should reach 70 within four years. Even the Service admits the initial objective of 70 sea otters at San Nicolas Island will occur. The fact that this event may not have occurred as rapidly as the Service hoped does not mean the translocation program failed, particularly when the Service's implementation of the program is a principal cause of the delay. In light of these facts, the Service should recognize under its existing regulatory authority that the translocation has not failed. The Service simply did not give the translocation sufficient time to achieve the population objectives given the reduction in the number of animals actually translocated.	Criterion 2. The number of sea otters translocated to San Nicolas Island is not a factor considered in any of the failure criteria, including Criterion 2. We disagree with the commenter's assertion that it is arbitrary and capricious to determine failure by the standards specifically established in the translocation rule for that purpose. It is the commenter who has offered up criteria for evaluating whether the translocation has failed that are not found in the underlying rule governing the program. Nevertheless, it should be noted that the translocation plan did not require that 250 sea otters be translocated but rather authorized the Service to translocate "up to" 250 sea otters. The Service captured the maximum number of sea otters allowed by the translocation plan (250). Of these, 139 (plus one rehabilitated pup) were deemed to be appropriate for translocation. The commenter suggests that because the Service did not move the maximum allowable numbers of sea otters to San Nicolas Island, it is unfair to conclude that the translocation has failed. Under the translocation rule, an established population at San Nicolas Island is defined as a minimum of 150 healthy sea otters, with a minimum annual recruitment of 20 sea otters. A stabilized population consists of a minimum of 70 sea otters under the rule. In fact, the Service translocated 69 sea otters, one fewer than the maximum number allowed during a one-year period, to San Nicolas Island during the first year, and yet, at the end of that year, a total of only 20 sea otters remained at the island. The following year, after making modifications to the program to increase the likelihood that sea otters would be successfully translocated, we translocated 57 additional sea otters to San Nicolas Island, again not far below the maximum number of otters allowed to be translocated in a given year. At the end of two years (and a total translocation of 126 sea otters) even fewer sea otters—only 17—remained at San Nicolas Island. The translocation rule itself states that following the initial translocation of 70 sea otters the first year, "it is not likely that supplemental translocation after the initial 70 will involve more than small numbers of southern sea otters…" 50 CFR 17.84(d)(2). In our third and final attempt to translocate otters, we moved an additional 14 sea otters to San Nicolas Island. At the end of that year—the third year of the translocation—only 15 adult and sub-adult sea otters and 3 dependent pups remained at the island

		out of a total of 140 translocated sea otters. We have concluded that the high dispersal rate of sea otters from San Nicolas Island is the primary reason that the population was so small after three years of translocation effort and why, 25 years after the initial translocation, the population is far from becoming "established" under the translocation rule, and has yet even to reach "stabilized" status. The commenter's hypothesis that simply translocating more sea otters to San Nicolas would have resulted in an established population or even a stabilized population today or would have avoided failure under Criterion 2 is unsupported by the facts surrounding the translocation. That a population size of 70 animals or more may eventually be attained at San Nicolas Island is not relevant to our determination of failure. As indicated above, the translocation rule defines an established population as a minimum of 150 healthy male and female otters, originating from a breeding nucleus of 70 sea otters, not a total of 70 sea otters originating from a breeding nucleus of 12 or fewer animals. Over the 25 years it has been in existence, the translocation program has never come close to achieving its primary goal of producing a second, self-sustaining population of sea otters at San Nicolas Island that could produce sufficient numbers of sea otters to repopulate the mainland range in the event of catastrophic mortality. The initial high rate of dispersal of translocated sea otters from San Nicolas Island is the primary cause of failure under Criterion 2 not only because of its direct effect on the subsequent size of the San Nicolas Island colony, but also because of its implications for the recovery strategy at the heart of the program: the intended function of the San Nicolas Island population as a self-sustaining "reserve colony for providing stock to restore subsequently damaged areas" in the southern sea otter's range (52 FR 29754; August 11, 1987). The high rate of dispersal of translocated sea otters from San Nicolas Island following three years of translocation effort refutes the commenter's speculation that simply translocating more otters to San Nicolas Island would have resulted in a larger current population at San Nicolas Island. The high rate of dispersal of translocated sea otters also suggests it is unlikely that the colony will ever be large enough to remain viable *and* to supply the numbers of sea otters necessary to perform a successful translocation and re-establishment of population in the mainland range if the parent

		population were reduced or eliminated by a catastrophic event. It should be noted that, based in part on data gained while implementing the translocation program, the recovery strategy has fundamentally changed. The revised recovery plan recommends against additional translocations and instead advocates allowing natural range expansion (USFWS 2003).
101	Four other factors confirm the success of the translocation: 1) virtually all of the sea otters at San Nicolas Island are offspring of the originally translocated population, indicating there is a healthy and successfully reproducing population at San Nicolas Island; 2) at least 150 pups have been born at San Nicolas Island, further confirming the presence of a healthy reproducing population; 3) the San Nicolas Island population is reproducing at a rate of 10 percent annually, which is better than the 5-6 percent rate of the parent population; and 4) the San Nicolas Island population is healthier than the parent population, in that a comparison of the translocated population with the parent population found that the "length and mass at age and the age-specific mass to length ratios were significantly greater for sea otters at San Nicolas Island than in the central population." This does not sound like a failed population. It sounds like a population that is healthier than the parent population.	While the commenter is correct that the San Nicolas Island colony is successfully reproducing, that it has grown since its low point in the early 1990s at an average annual rate that exceeds the growth rate of the mainland population (although the overall average annual growth rate at San Nicolas Island has dropped from 9 percent to 7 percent with the inclusion of the past several years of data), and that sea otters at San Nicolas Island exhibit greater mass-to-length body ratios than those in the mainland range, these facts do not alter our assessment that the translocation program has failed. The commenter seeks to substitute new standards for those clearly outlined in the translocation plan and implementing regulations for the program. The translocation program evaluation (Appendix C to the RDSEIS/FSEIS) assesses the program in relation to the objectives for which it was undertaken and the specific regulatory failure criteria contained in the rule at 50 CFR 17.84(d) that established the translocation program. We have determined that the program has failed under Criterion 2. The initial high rate of dispersal of translocated sea otters from San Nicolas Island is the primary cause of failure under Criterion 2 not only because of its direct effect on the subsequent size of the San Nicolas Island colony, but also because of its implications for the recovery strategy at the heart of the program: the intended function of the San Nicolas Island population as a self-sustaining "reserve colony for providing stock to restore subsequently damaged areas" in the southern sea otter's range (52 FR 29754; August 11, 1987). The high rate of dispersal of translocated sea otters suggests it is unlikely that the colony will ever be large enough to remain viable *and* to supply the numbers of sea otters necessary to perform a successful translocation and re-establishment of population in the mainland range if the parent population were reduced or eliminated by a catastrophic event. The translocation program has not achieved its primary recovery goal of producing a second, self-sustaining population of sea otters that could produce

		sufficient numbers of sea otters to repopulate the mainland range in the event of catastrophic mortality.
102	The Service incorrectly concludes that "the creation of an established southern sea otter population at San Nicolas Island does not appear to be achievable." The facts regarding the status, trend, and health of the San Nicolas Island population belie that conclusion.	We make this statement because the translocation rule at 50 CFR 17.84(d)(1)(vi) defines an "established experimental population" of southern sea otters as "an estimated combined minimum of 150 healthy male and female otters residing within the translocation zone, little or no emigration into the management zone occurring, and a minimum annual recruitment to the experimental population in the translocation zone of 20 sea otters for at least 3 years of the latest 5 year period, or replacement yield sufficient to maintain the experimental population at or near carrying capacity during the post-establishment and growth phase or carrying capacity phase of the experimental population." The logic underlying this definition is explained in the preamble to the final rule: "The Service does not consider the mere presence of sea otters in the translocation zone an indication that a new population is established. If a catastrophic event were to decimate a portion of the parent population, it is possible that the relocated otters could be used to restore the damaged portion of the parent population; however, it would also likely eliminate the value of the new population to serve as a reserve colony for providing stock to restore subsequently damaged areas and it could eliminate the reproductive viability of the colony such that the remaining animals could not be self-sustaining. Therefore, to be considered established it must be a reproductively viable unit, capable of maintaining itself even if 25 animals are removed each year for 1 to 3 years or replacement yield is sufficient to maintain the experimental population at or near carrying capacity during the post-establishment and growth phase or carrying capacity phase for the purposes of repairing damage to the parent population" (52 FR 29754; August 11, 1987). Two circumstances make achievement of this objective unlikely. First, the future of the San Nicolas Island colony is uncertain. Its small population size (hence its susceptibility to demographic as well as environmental stochasticity) makes it difficult to predict when, if ever, the population may become "established." Second, if the San Nicolas Island colony were to become "established" at some point in the future (with a population size of 150 southern sea otters and an annual recruitment of 20 animals), our experience

		with the translocation of southern sea otters to San Nicolas Island indicates that if a catastrophic event were to affect the parent population, it is unlikely that we would be able to reestablish a viable southern sea otter population by moving small numbers of animals (25) from San Nicolas Island to the parent population annually over a 3-year period. The high emigration apparently inherent in sea otter translocations combined with the small number of animals available to be moved would make it unlikely that a core population could become established in the damaged area.
103	The Service's conclusion that the San Nicolas Island translocation has failed is arbitrary and capricious under the Administrative Procedure Act. The Supreme Court has held an agency action is arbitrary and capricious if the agency (1) has relied on factors Congress has not intended it to consider, (2) entirely failed to consider an important aspect of the problem, (3) offered an explanation for its decision that runs counter to the evidence before the agency, or (4) has offered an explanation for its action that is so implausible it could not be ascribed to a difference of view or the product of agency expertise. Here, at a minimum, the Service has offered an explanation for its decision that runs counter to the evidence.	The translocation program evaluation (Appendix C to the RDSEIS/FSEIS) assesses the program in relation to the objectives for which it was undertaken and the specific regulatory failure criteria contained in the rule at 50 CFR 17.84(d). We have determined that the translocation program has failed under Criterion 2 of the specific regulatory failure criteria at 50 CFR 17.84(d)(8). We have also concluded that the translocation program has failed to fulfill its primary purpose as a recovery action. The translocation program evaluation provides a clear and rational explanation for our failure determination based on a careful review of the facts surrounding the translocation in relation to the regulatory failure criteria and the program's recovery purpose. We reject the commenter's assertion that the evaluation of the translocation program is arbitrary or capricious or counter to the evidence before us.
104	The primary purpose of the translocation program was to increase the population toward the delisting level. That objective is met. The Service's failure finding is without merit.	The primary purpose of the translocation program was not simply to increase the number of southern sea otters but to achieve a primary recovery action for the species. The translocation rule 50 CFR 17.84(d) quotes the recovery plan (USFWS 1982) at length to elucidate the relationship of the translocation program to recovery: "Sea otter translocation, if properly designed and implemented, should provide the necessary foundation for ultimately obtaining the Recovery Plan's objective and restoring the southern sea otter to a non-threatened status and maintaining OSP by: (i) Establishing a second colony (or colonies) sufficiently distant from the present population such that a smaller portion of southern sea otters will be jeopardized in the event of a large-scale oil spill and (ii) establishing a data base for identifying the optimal sustainable population level for the sea otter." The translocation program has not achieved its primary recovery goal. In fact, based in part on

		data gained while implementing the translocation program, the recovery strategy has fundamentally changed. The revised recovery plan recommends against additional translocations and instead advocates allowing natural range expansion (USFWS 2003). See also our response to comment 103.
105	The Service uses newly minted standards to reach its conclusion that the translocation program has failed. One of these newly minted standards is that the translocated population is small and its ability to become established is uncertain. However, the applicable regulations set a minimum acceptable population for translocated sea otters at 25, a number well below the current population of 46. That the population is small is not the relevant standard. The existing regulatory standards for declaring translocation a failure are not satisfied.	The translocation program evaluation (Appendix C to the RDSEIS/FSEIS) assesses the program in relation to the objectives for which it was undertaken and the specific regulatory failure criteria contained in the rule at 50 CFR 17.84(d). We have concluded that the translocation program has failed to fulfill its primary purpose as a recovery action. Additionally, in our formal review of the program, we have determined that the program has failed under Criterion 2 of the specific regulatory failure criteria at 50 CFR 17.84(d)(8). Thus the commenter is incorrect in asserting that we relied on new standards not found in the regulations. The commenter proposes that the Service rewrite regulatory failure Criterion 2 in the translocation rule to provide that a minimum of 25 sea otters must be present today at San Nicolas Island and not as of 1990, three years following the initial translocation, as the criterion states. The commenter's interpretation of failure Criterion 2 is at odds with its plain language and disregards the primary recovery goal underlying the translocation program. The goal of the program was not simply to create a small, distant colony of sea otters. The goal of the program was to establish a distant population of at least 150 healthy male and female otters residing with a minimum annual recruitment of 20 sea otters (50 CFR 17.84(d)(1)(vi). The logic underlying this definition is explained in the preamble to the final rule: "The Service does not consider the mere presence of sea otters in the translocation zone an indication that a new population is established. If a catastrophic event were to decimate a portion of the parent population, it is possible that the relocated otters could be used to restore the damaged portion of the parent population; however, it would also likely eliminate the value of the new population to serve as a reserve colony for providing stock to restore subsequently damaged areas and it could eliminate the reproductive viability of the colony such that the remaining animals could not be self-sustaining. Therefore, to be considered established it must be a reproductively viable unit, capable of maintaining itself even if 25 animals are removed each year for 1 to 3 years or replacement yield is sufficient to

		maintain the experimental population at or near carrying capacity during the post-establishment and growth phase or carrying capacity phase for the purposes of repairing damage to the parent population" (52 FR 29754; August 11, 1987). The population of southern sea otters at San Nicolas Island—even after 25 years—has yet to reach the status of an "established" or even a "stabilized" population as defined by the translocation rule at 50 CFR 17.84(d)(1)(vi) or (vii) and is unlikely ever to serve the recovery purpose envisioned for it under the translocation program.
106	Another newly minted standard set forth to judge the translocation is that there were issues associated with the original capture program, which ceased over 14 years ago. The applicable regulations required that captured animals be transported to the relocation area no more than five days after capture (50 C.F.R. §17.84(d)(3)(ii) and (iii)). Often, however, those time requirements were not observed, and the animals were kept in temporary holding areas for much longer periods. Further, many animals were subjected to questionable and dangerous surgical procedures to implant tracking devices. Several failed to survive the surgery. Problems associated with the prior capture and transport process resulted not from weaknesses in the transport program but from the Service's actions. Such problems could have been remedied. Thus, the Service's complaints about the capture and transfer program are suspect. These problems have nothing to do with the current status of the San Nicolas Island population.	It is unclear whether the commenter is referring to the containment portion of the program, which was suspended in 1993 (now 19 years ago), or the translocation portion of the program, which is described in the specific section of the rule that the commenter cites. In the Translocation Program Evaluation, we summarize the history of the translocation program, including the difficulties we experienced capturing and moving sea otters both into the translocation zone and out of the management zone, in order to provide an honest and accurate assessment of the program. That several otters died either during or as a likely consequence of translocation or containment is a fact. However, we have concluded that the translocation program is a failure because it has failed to achieve its overarching recovery purpose and, specifically, because it has failed under Criterion 2 of the regulatory failure criteria established in the translocation rule at 50 CFR 17.84(d)(8). Thus the commenter is incorrect in asserting that our failure determination is based on new standards not found in the regulations. With regard to the commenter's specific assertions about the transport process, we estimate that 6 sea otters out of a total of 252 sea otters captured for potential translocation died of stress-related causes prior to transport. We made changes in our translocation procedures prior to the second year of the program in an effort to decrease the time between capture and release and thereby reduce stress on captured sea otters. We also made changes to containment operations to reduce stress on captured sea otters. The initial strategy of releasing sea otters at their known original capture sites in the mainland range resulted, in most cases, in lengthy travel times and additional handling of the animals. To reduce this source of stress on captured sea otters, we revised our strategy to release

		recaptured animals at more easily accessible sites in the northern portion of the parent range. Despite the increased distance, the accessibility of these sites reduced transport times and resulted, we believed, in reduced stress and the improved well-being of moved sea otters. We also hoped that releasing animals at the northern end of the range would reduce the likelihood that animals would return to the management zone because of the greater distances they would have to travel. Despite these changes, in February 1993, two sea otters that had been recently captured in the management zone were found dead shortly after their release in the range of the parent population. Of the 24 sea otters captured in the management zone from 1987 to 1993, 4 sea otters are known or suspected to have died within two weeks of being removed from the management zone. These deaths led to a determination to suspend containment of sea otters in the management zone. The commenter is correct that none of these problems is the primary reason the San Nicolas Island population declined so precipitously after the translocation of 140 otters to the island. We consider the emigration of translocated sea otters from the island to be the primary reason for the population's initial (and hence continued) small size.
107	If the Service acknowledges the modifications made to the original plan (translocation of fewer sea otters than planned) and adapts its continued implementation of this alternative relative to an adjusted temporal scale and current resource conditions, then Alternative 1 will not only protect the sea otter, but it will also sustain valuable marine fisheries and enhance the restoration of depleted and endangered species in southern California. This alternative can work well if the Service takes an ecological landscape view and adapts its management efforts based on experiences learned in the field, continued resource data acquisition, and collaboration with both the State and the private sector.	The commenter is incorrect in stating that the Service modified the original plan to translocate fewer sea otters than planned. As discussed in our response to comment 100, the translocation plan allowed "up to" 250 sea otters in total to be transported but anticipated that after an initial translocation of 70 sea otters, only small additional numbers of animals would likely need to be translocated (50 CFR 17.84(d)(2)). We note that we captured the maximum number of sea otters allowed by the translocation plan (250). Of these, 139 (plus one rehabilitated pup) were deemed to be appropriate for translocation. We did not seek authorization to translocate additional sea otters because of concerns that the introduction of additional translocated animals would disrupt the very small colony that remained at the island, possibly resulting in additional deaths or emigration from the island. We evaluate the effects of Alternative 1 on the nearshore marine ecosystem, sea otter recovery, and commercial fisheries in section 6.3 of the RDSEIS/FSEIS.

108	Even though all the translocated sea otters were identified as "Excess and Non-Essential," and some mortality was expected, the Service used the deaths of a few of these animals as an excuse to terminate the containment program. This allowed sea otters to now roam freely throughout the management zone.	Sea otters translocated to San Nicolas Island were designated as "experimental" but not "non-essential" under Public Law 99-625. The internal biological opinion developed by the Service for the translocation program did not specifically address mortality associated with containment, although it noted that sea otters could experience additional stress if they were captured a second time (USFWS 1987). The distance from the mainland and abundant food resources were anticipated to be the primary means by which sea otters would be kept from entering the management zone (USFWS 2000). We did not anticipate the level of mortality that occurred in connection with the containment portion of the program.
109	Following termination of the Containment Program, sea urchin fishermen offered to fund containment, using their boats, knowledge of the Channel Islands, and their operators. The Service refused the offers.	We considered enlisting the services of fishers and their boats for capture operations, but because the techniques for capturing sea otters are specialized (for example, they require the use of rebreathers), we determined that these options were not cost-effective or efficient. Our 2000 biological opinion subsequently evaluated the containment portion of the program and determined that continuation of it would likely jeopardize the continued existence and impede the recovery of the species (USFWS 2000).
109.5	While the translocation has failed under Criterion 2, the Service should also consider promulgating an additional regulatory test which would specify that failure to achieve carrying capacity by this time results in an automatic failure determination.	The translocation program evaluation (Appendix C to the RDSEIS/FSEIS) assesses the program in relation to the objectives for which it was undertaken and the specific regulatory failure criteria contained in the rule at 50 CFR 17.84(d) that established the translocation program. We have concluded that the translocation program has failed to fulfill its primary purpose as a recovery action. Additionally, in our formal review of the program, we have determined that the program has failed under Criterion 2 of the specific regulatory failure criteria at 50 CFR 17.84(d)(8). We do not believe it is necessary to promulgate an additional regulatory test that would specify that failure to achieve carrying capacity by this time results in an automatic failure determination.
110	The Service has asserted that it is "unable to evaluate whether the program has failed under Criterion 3 because we never reached the minimum number of sea otters at San Nicolas Island required to complete the transplant phase of the program." Given the significant decline in the population evident two years after the effective end of the transplant phase, and the lack of substantial population growth in the intervening 19 years, the Coalition (Defenders of Wildlife, Friends of the Sea Otter, The Humane Society of the United	We acknowledge in the translocation program evaluation that although we never achieved the requisite number of 70 sea otters to consider the transplant phase completed and thus cannot evaluate the program under Criterion 3, from a practical perspective the transplant phase ended with the translocation of the last sea otter to San Nicolas Island in 1990. At that time, after the translocation of 140 sea otters to the island, 14 independent sea otters remained. Two years later, 13 independent sea otters remained, and despite

	States, the Monterey Bay Aquarium, and Oceans Public Trust Initiative, a project of Earth Island Institute's International Marine Mammal Project) believes that the spirit and intent of Criterion 3 have been met and that these facts provide an additional basis for declaring the translocation a failure. While the Service is correct that the minimum population was never reached at SNI, that does not mean that Criterion 3 cannot be evaluated. In 1992, two years following the effective end of the transplant phase in 1990, the SNI population was a mere 13 sea otters, down from 140 released at SNI originally. Thus, rather than witnessing reasonable population levels and evidence of recruitment of otters born to translocated animals, project managers observed a dramatic decline in the population at SNI during the transplant phase of the translocation. Based on the plain language of the regulation and the population numbers present at the required time of evaluation, the translocation must be declared a failure.	evidence of pupping, there appeared to be little or no recruitment into the population. Criterion 3 clearly does not anticipate that the "significant declines" to which it refers would occur immediately upon the release of sea otters at the island, such that even with the transport of 140 sea otters, we were still unable to retain, at any one time, the minimum number of 70 sea otters at the island. In this sense, the program may be seen as having failed more dramatically than was anticipated under Criterion 3. Unlike Criterion 3, Criterion 2 effectively captures the realized outcome of immediate significant declines and a resulting core population size well below the threshold of 70 animals. We note that, under 50 CFR 17.84(d)(8), a determination that any one of the failure criteria has been met is sufficient to declare that the translocation program has failed (50 CFR 17.84(d)(8)). We have determined that the program has failed under Criterion 2.
111	The Service states in the Draft Evaluation that "[t]echnically, criterion 4 has not been met." We disagree. The Service has reached the conclusion that "containment cannot be successfully accomplished," and thus the standard for failure has been met. Pursuant to 50 C.F.R. § 17.84(d)(8)(iv), the translocation has failed if "FWS determines … that sea otters are dispersing from the translocation zone and becoming established within the management zone in sufficient numbers to demonstrate that containment cannot be successfully accomplished." This standard is: [M]eant to be applied when it becomes apparent that, over time, (one year or more), otters are relocating from the translocation zone to the management zone in such numbers that: 1) an independent breeding colony is likely to become established within the management zone; or 2) they could cause economic damage to fishery resources within the management zone. It is expected that [FWS] could make this determination within a year, provided that sufficient information is available. The key element of this criterion is otters "becoming established within the management zone in sufficient numbers to demonstrate that containment cannot be successfully accomplished." While southern sea otters have not moved from the *translocation zone* to the management zone, since 1998, 50-150	We acknowledge that successful containment of sea otters, or maintenance of an "otter-free" management zone, is likely infeasible and cannot be accomplished by simply capturing animals in the management zone and moving them to another location. Returning southern sea otters that have migrated south into the management zone from the mainland range back to the parent population would likely result in jeopardy to the species. Moving southern sea otters that entered the management zone from the mainland range to San Nicolas Island would likely result in dispersal of the sea otters from the island back into the management zone or back into the parent population, as occurred during the initial translocation phase of the translocation program. Thus, containment of southern sea otters from the management zone would likely be unsuccessful. Nevertheless, applying the literal language of failure Criterion 4 which refers to southern sea otters dispersing from the translocation zone into the management zone rather than to southern sea otters dispersing into the management zone from the mainland range, we have not changed our conclusion that the the translocation program has not met this criterion.

	southern sea otters have seasonally moved from the parent range to the management zone. The Service determined that containing this emigration is ineffective as a long-term management action and stated: "The difficulties associated with sea otter capture and transport, our concern for the welfare of animals removed from the management zone, the adverse effects of sea otter containment on the parent population, and the adverse effects on fisheries are concerns regardless of whether sea otters enter the management zone from the parent range or from San Nicolas Island." Further, as the Service concluded in the 2000 biological opinion, continuing the containment policy will likely jeopardize the continued existence of the southern sea otter. This finding prohibits the Service from continuing the containment program under section 7(a)(2) of the ESA. Therefore, Criterion 4 has been satisfied because as the Service has determined, containment "cannot be accomplished." While the sea otters entering the management zone are not from the SNI population, they nevertheless have led the Service to conclude that containment is not feasible and would violate the ESA, and therefore, the program should be declared a failure.	
112	The Service determined that "[c]riterion 5 has not been met." We disagree, and we believe that the Service's own statements about the prospects for the SNI population support a failure determination under criterion 5. Pursuant to 50 C.F.R. § 17.84(d)(8)(v), the translocation has failed if the: [H]ealth and well-being of the experimental population should become threatened to the point that the colony's continued survival is unlikely, despite the protections given to it by [FWS], State, and applicable laws and regulations. An example would be if an overriding military action for national security was proposed that would threaten to devastate the colony and the removal of otters was determined to be the only viable way of preventing the loss of the colony. The health and well-being of the SNI population is seriously in question due to its small size, vulnerability to an oil spill, epizootic, or other catastrophic event, and potential lack of genetic diversity due to the small parent population. In the Service's brief explanation of its conclusion regarding Criterion 5, it states that "[t]here are no proposed Federal, State or local actions that threaten to devastate the colony." While this is true, it is not the proper basis to evaluate Criterion 5. The proper	We agree with the commenter that the San Nicolas Island colony remains vulnerable due to its small size and the potential for an oil spill, epizootic, or other catastrophic event. Nevertheless, there are no proposed actions that would threaten to devastate the colony. Therefore, we have not changed our reasoning regarding whether the translocation program has met Criterion 5.

	consideration is the likelihood of the SNI population's survival. In this regard, the Service points out that the population has "persisted," but it has also stated "it is not certain that the San Nicolas colony will persist." Given the Service's own doubts about the future viability of the SNI population, the Service should follow the plain language of Criterion 5 and declare the translocation program a failure on that basis.	
	Capture and Relocation of Sea Otters	
113	P. 13, 20 NMFS could not locate information in the RDSEIS suggesting that the evaluation of sea otter capture and transport methods was ever completed. NMFS suggests including information in the RDSEIS on the referenced evaluation of sea otter capture and transport methods, including any results and recommendations to improve capture and transport methods. Any recommendations stemming from the evaluation in regards to improved techniques to minimize capture and transport stress and survivability should be included in the description for this Alternative 2.	Our assessment of available sea otter capture and transport methods did not result in any formal recommendations for improvement. Therefore, we are unable to add recommendations regarding improved capture and transport methods to Alternative 2 as the commenter suggests. Our 2000 biological opinion subsequently evaluated the containment portion of the program and determined that continuation of it would likely jeopardize the continued existence and impede the recovery of the species (USFWS 2000). We note in Table 3-1 and section 6.4.3.3 of the RDSEIS/FSEIS that before selecting Alternative 2, we would reinitiate consultation under the ESA to consider any new information that is available. If the resulting opinion concluded that continuation of the program would not likely jeopardize the southern sea otter, containment under Alternative 2 could be considered a viable option.
114	It was clear from the beginning that the Service had no real commitment to this component of the Translocation (enforcing a management zone). Although an 800-phone number was set up for reporting sea otters in the management zone, the phone was not answered on weekends. A sea otter sighted on Friday would not be looked for until Monday. A sea otter could be hundreds of miles away by then. The Service dive team had only one member. It was instead the CDFG who conducted the containment efforts.	The Service made a good-faith effort, in cooperation with CDFG, to achieve containment. We established a 24-hour hotline to accept information on sea otters detected in the management zone. Most reports of sea otters in the management zone were received by this means. Aerial flights were also undertaken to locate sea otters in the management zone. However, for reasons discussed in the "Containment Results" section of the translocation program evaluation (Appendix C to the RDSEIS/FSEIS), containment was more difficult than anticipated.
115	When critically analyzed, it can be seen that the capture-and-relocate methods used at the time of the original translocation to San Nicolas Island were indeed quite successful, contrary to later unsupportable statistics.	As described in the "Containment Results" section of the Translocation Evaluation (Appendix C to the RDSEIS/FSEIS), four sea otters were known or suspected to have died within two weeks of being removed from the management zone. The Service suspended capture activities in 1993 after two sea otters that had recently been captured in the management zone were found dead shortly after their release. Containment efforts were not successful given that the goal of containment was to remove sea otters from the management zone and

		to release them into the parent population or at San Nicolas Island non-lethally (without endangering their health or survival).
116	The ability to maintain a marine protected area (modified management zone) is well within the Service's capacity. For many years, the Monterey Bay Aquarium has operated a successful sea otter capture program featuring the temporary capture, possession, rehabilitation, transfer, and release of sea otters. This program has been operating under a Letter of Authorization and has served to successfully refine and improve sea otter capture and management strategies. Similarly, in May of this year, researchers with the Southeast Alaska Sea Otter Project, which included the Service, demonstrated the feasibility of a successful sea otter capture program.	Cooperative activities involving CDFG, the Service, Monterey Bay Aquarium, and others have resulted in the capture, tagging, and release of sea otters over many years, with very limited mortality. However, most of the research conducted has not involved the relocation of animals. There is a fundamental distinction to be made between capture and immediate release in the same location and capture followed by translocation. Research on translocation and homing behavior, which was predicated on the relocation of animals, resulted in some associated mortality (*e.g.,* Ralls *et al.* 1992).
	Retention of the Sea Otter Colony at San Nicolas Island	
117	If the Service declares the translocation program a failure, it should remove sea otters from San Nicolas Island. Leaving them there is counter to all of the discussions, commitments, and intentions expressed during development of the original plan and rule.	The commenter recommends that the Service remove the small but healthy population of southern sea otters from San Nicolas Island if we terminate the translocation program because that is the commitment we made when the program was initiated 25 years ago. Our proposed action, to declare the program a failure but to retain sea otters at San Nicolas Island, is based in part on the recognition, gained from our experience implementing the translocation program, that if sea otters were removed from the island, some would return, some would die, and the introduction of these sea otters into the mainland population would likely further stress a food-limited population. During public hearings, one fisherman reported that he and other fishermen had discussed the issue and recognized the fact that if the San Nicolas Island population were removed, some sea otters would likely return immediately to San Nicolas Island (just as many returned immediately to the mainland range after being translocated to San Nicolas Island) and stated that although they believed the program should not be declared a failure, they did not want sea otters to be removed from San Nicolas Island if the program were declared a failure. We do not believe that removal of southern sea otters from San Nicolas Island, if determined allowable under the Endangered Species Act, would further the species' survival or its recovery. It is for this reason that we proposed terminating the translocation program, including removing the existing regulatory requirement to remove sea otters from San Nicolas Island, and requested public review and comment on this issue.

118	The small population at San Nicolas Island should not be captured and translocated elsewhere. We are particularly concerned that the relocation of sea otters from San Nicolas Island back to the mainland could result in increased risk of mortality due in part to the stress associated with capture, handling, and time out of water, and in part to the general lack of familiarity of the animals with their new environments. Previous translocation efforts have shown that such stress and mortality is both significant and inevitable. Further, competition with the resident sea otter populations in the central part of the California coast would be detrimental to both populations competing for limited food resources.	Our proposed action, to declare the program a failure but to retain sea otters at San Nicolas Island, is based in part on the recognition that if sea otters were removed from the island, some would return, some would die, and the introduction of these sea otters into the mainland population would likely further stress that food-limited population.
118.5	It is a bad idea to move sea otters from San Nicolas Island because they have homing instincts, and there is a good chance they will return to the island or end up populating the rest of the Channel Islands.	We recognize that if sea otters were removed from San Nicolas Island, some would return, some would die, and some would likely disperse into other areas of the Southern California Bight.
119	Since the zonal management system was first implemented, substantial new information on the population status, behavior, and ecology of the southern sea otter has revealed that effects of containment that were not previously considered have continued to develop, and placed a renewed importance on retention of the SNI population. Recent studies have demonstrated that moving sea otters from SNI and the "otter-free" zone into the central part of the range would have potentially deleterious effects on social structure and could greatly exacerbate problems involving competition in a very food limited area. Removal of southern sea otters from SNI will result in the direct deaths of individuals (presumably at the same 17 percent rate specified in the 2000 BO) and the disruption of social behavior in the parent population, in that those affected individuals will have reduced potential for survival and reproduction. In order to avoid these negative consequences and meet the requirements of ESA Section 7(a)(2), southern sea otters should be left at SNI according to Alternative 3C.	We describe the effects on sea otters of removal from San Nicolas Island or the management zone (as required under Alternatives 3A and 3B) in sections 6.5.3.3 and 6.6.3.3 of the RDSEIS/FSEIS. Relocating sea otters from the management zone and San Nicolas Island to the northern or central portion of the existing range would increase competition among sea otters, especially in areas of the central coast now thought to be food-limited (see Tinker *et al.* 2008b), disrupt natural behaviors, and likely result in the deaths of otherwise healthy animals. The incidental injury or death of sea otters removed from San Nicolas Island or the management zone would likely be unavoidable. The relocation of sea otters results in increased risk of mortality due in part to the stress associated with capture, handling, and time out of water, and in part to the general lack of familiarity of the animals with their new environments (Estes *et al.*, n.d.). Sea otters that have learned to forage in prey-rich environments (such as San Nicolas Island) may experience additional stress or even starvation resulting from their inability to find adequate food in prey-limited areas of the mainland range. For males, there may be an added risk of death or injury from encountering territorial males in unfamiliar habitats (Estes *et al.*, n.d.). Some sea otters would likely attempt to return to their location of capture, depleting their energy reserves and increasing their risk of mortality. Overall, relocating sea otters from San Nicolas Island or the management zone to the mainland range would be disruptive, harmful, or possibly lethal, both to the relocated animals and to those in the receiving population. The effects of

		removing the population of southern sea otters from San Nicolas Island and relocating them into the parent population would be similar to those analyzed in the 2000 biological opinion that resulted in our jeopardy determination. Prior to making a decision to remove otters from San Nicolas Island we would have to complete a formal internal Section 7 consultation under the Endangered Species Act and determine that such relocation would not result in jeopardy to southern sea otters.
Procedural and Legal Issues		
120	The Service's preferred alternative violates the intent of Congress in passing Public Law 99-625. The law established a dual mandate to protect the sport and commercial fisheries of Southern California from the effects of sea otters, both biologically and legally, along with establishing a viable otter population at San Nicolas Island.	The text of Public Law 99-625 is included as Appendix A to the FSEIS, and its provisions to allow for a major recovery action for sea otters while minimizing fishery conflicts with a translocated population are discussed in the Executive Summary, Introduction, and Background sections of the document. Public Law 99-625 authorized—but did not require—the Service to develop and implement a southern sea otter translocation plan. It set forth certain components that such a plan must contain, if developed, including provisions to minimize conflict between sea otters and shellfish fisheries. Implementing regulations for the translocation program (52 FR 29754; August 11, 1987), included as Appendix D to the RDSEIS/FSEIS, specifically address the possibility that the translocation could fail. Our preferred alternative in the RDSEIS/FSEIS recognizes that the translocation program authorized under Public Law 99-625 has failed and should be terminated.
121	The Marine Mammal Commission supports the Service's plan to retain the existing otter population at San Nicolas Island and give it an opportunity to become fully established. The Southern Sea Otter Recovery Team advised the same, and Service's biological opinion also recognized that capture and removal would pose an unnecessary risk to the San Nicolas Island otters and the population as a whole. However, the applicable regulations do not contain such an option. Therefore, to address this concern, the Marine Mammal Commission recommends that, as part of a proposed rulemaking to terminate the sea otter translocation, the Fish and Wildlife Service include proposed amendments to section 17.84(d)(8)(vi) to eliminate the requirement that sea otters at San Nicolas Island be returned to the parent population and complete that part of the rulemaking prior to making a final failure determination. It is our understanding that the Service intends to repeal section 17.84(d) in its entirety in the contemplated rulemaking. If this is	The Service appreciates the concern of the Marine Mammal Commission regarding elimination of the existing regulatory requirement to remove otters from San Nicolas Island and from the management zone prior to declaring the program a failure. We do not consider a two-step regulatory process to be legally required to terminate the program. We have been very clear in the draft SEIS, revised draft SEIS, final SEIS, and in our Federal Register notice on the proposed rule (76 FR 53381; August 26, 2011) that the proposed action is to terminate the program while allowing southern sea otters to remain at San Nicolas Island and in the management zone. We have held public hearings and requested public comment on the proposed action. The means of effectuating this action is to remove, in its entirety, the translocation rule at 50 CFR 17.84(d), which governs the establishment, goals, operation, and termination of the translocation program. By removing the translocation rule in its entirety through the final rulemaking, we are eliminating all

	the case, it may be necessary for the Service to include different effective dates for different provisions, so that paragraph (8)(vi) is amended prior to repeal of subsection (d) as a whole. Only in that way can the Service ensure that it will not be required to remove otters from San Nicolas Island as a consequence of making a failure determination.	of the internal components of the rule, including the requirements to remove sea otters from San Nicolas Island and from the management zone following a determination that the program has failed. This rulemaking process is consistent with that set forth in 50 CFR 17.84(d)(8), which requires the Service to amend the rule to terminate the program if we determine the program has failed. The only difference is that we are eliminating the rule in its entirety—including the requirement to remove sea otters from the management zone and San Nicolas Island—rather than amending the rule to terminate the program while leaving the removal requirements in place. Given the significant opportunities we have provided to stakeholders and members of the public to review and comment on the proposed action, we do not believe a two-step rulemaking process, which would require the development, publication, and public comment and review of a separate intervening amendment to 50 CFR 17.84(d)(8) to eliminate the obligation to remove southern sea otters from San Nicolas Island and the management zone prior to elimination of 50 CFR 17.84(d) in its entirety, is necessary. Indeed, the extensive public comment we received on the draft SEIS, the revised draft SEIS, and the proposed rule to remove 50 CFR 17.84(d) demonstrates that members of the public are well informed about the proposed action and its consequences. We note that the obligation to remove sea otters from San Nicolas Island and from the management zone in the event of a failure determination is not triggered under 50 CFR 17.84(d) until the rule has been amended to terminate the translocation program. For that reason, we consider the Marine Mammal Commission's concern that we would be compelled to remove sea otters upon declaration of failure and prior to finalization of the proposed rulemaking that eliminates the removal requirement to be misplaced.
122	The Marine Mammal Commission notes that the Service issued a biological opinion under Section 7 of the Endangered Species Act in July 2000 finding that continuing to carry out otter containment activities in the management zone would jeopardize the continued existence of the southern sea otter. Based on that opinion, the Service published a policy statement on 22 January 2001 (66 FR 6649) that it would no longer capture and remove sea otters found in the management zone. Presumably, the rationale for that biological opinion and the Service's policy about removing sea otters also applies to sea	Our preferred alternative, to declare the program a failure but to retain sea otters at San Nicolas Island, is based in part on the recognition that if sea otters were removed from the island, some would return, some would die, and the introduction of these sea otters into the mainland population would likely further stress that food-limited population. The effects of moving large numbers of otters from the management zone back into the parent population were thoroughly evaluated in our 2000 biological opinion on the containment component of the translocation program (USFWS 2000). We

	otters within the translocation zone. If this is the case, the Marine Mammal Commission believes that this issue should be discussed within the scope of this rulemaking and reflected in the administrative record. This would provide an alternative legal basis to support a decision not to remove otters from the translocation zone upon finalizing a failure determination. That is, even if the translocation regulations are interpreted as requiring that otters be removed from the translocation zone, the Service would have a sound basis for arguing that doing so would constitute jeopardy and that adherence to the requirements of Section 7 takes precedence over the provisions of Public Law 99-625 and its implementing regulations.	concluded that removing large numbers of sea otters back into the parent range was likely to jeopardize the continued existence of the species. The effects of removing the population of southern sea otters from San Nicolas Island and relocating them into the parent population would be similar to those analyzed in the 2000 biological opinion that resulted in our jeopardy determination. Prior to removing sea otters from San Nicolas Island, we would have to complete a formal internal Section 7 consultation under the ESA and determine that such relocation would not result in jeopardy to southern sea otters. We describe the potential effects of removing sea otters from San Nicolas Island more fully in sections 6.5.3.3 and 6.6.3.3 of the RDSEIS/FSEIS.
123	Termination of translocation program does not change the statutory status of sea otters translocated under the program. Without amending the statute, once translocated, the translocated population of sea otters remains under the special status afforded by P.L. 99-625.	Public Law 99-625 authorized but did not require the Secretary to develop and implement the translocation plan. The statute further provided that if the Secretary chose to develop and implement such a plan, it must include a translocation zone and a management zone. The translocation and management zones are component parts of the translocation plan implemented by the Secretary and were designated by regulation when the translocation program was put in place (52 FR 29754; August 11, 1987) and codified at 50 CFR 17.84(d). Termination of the program, also by regulation, eliminates the zones to which the provisions defining the status of sea otters found in those zones are attached.
124	The California Coastal Commission has stated unequivocally that any decision by the Service to declare the translocation a failure, to terminate the management zone and to allow sea otters to remain at San Nicolas Island will require a determination by the Coastal Commission regarding the consistency of any such action with California's coastal zone management plan as to the impact on commercial fisheries.	On June 14, 2012, by a unanimous vote, the California Coastal Commission concurred with the consistency determination that the Service submitted for the termination of the southern sea otter translocation program. The Commission found the project to be consistent to the maximum extent practicable with the California Coastal Management Program.
125	The Service has unreasonably limited the alternatives to be analyzed.	We analyze the full range of alternatives that meet our purpose and need, which is to reevaluate the southern sea otter translocation program. These alternatives include resuming full implementation of the translocation program (Alternative 1), modifying it (Alternative 2), or terminating it, with various provisions regarding sea otters in southern California waters at the time of the termination (Alternatives 3A-3C).
126	There has been a reduction in risk to sea otters/the taxonomic status of the southern sea otter, as it is now the basis for the threatened species	Delisting the southern sea otter does not meet the purpose and need of this RDSEIS/FSEIS, which is to reevaluate the translocation program in light of new

	classification, is incorrect; therefore, sea otters should be delisted.	information gained since its inception, including the failure of the program to meet its primary recovery goal, and to meet other mandates related to the southern sea otter, such as the Service's requirement under the Marine Mammal Protection Act to restore the stock to its Optimum Sustainable Population level. Therefore, we do not evaluate delisting the southern sea otter as an alternative in this RDSEIS/FSEIS. It should be noted that delisting of a species is warranted only if the best scientific and commercial data available substantiate that it is neither endangered nor threatened for one or more of the following reasons: (1) extinction; (2) recovery; and/or (3) a determination that the original data used for classification of the species as endangered or threatened were in error [50 CFR 424.11]. The listing or delisting of a species does not require the preparation of an EIS. Petitions to delist species are evaluated by the Service to determine whether more extensive review is warranted.
127	Attached to this testimony and to become part of the record is the Save Our Shellfish official petition submitted to the Director of the US Fish & Wildlife Service on March 4, 2006. This petition calls for the second time for the Service to de-list the sea otter as a threatened species, citing unchallenged scientific findings as a basis for the de-listing. As was the case in Save Our Shellfish's original petition filed in 1981, the Service has taken no action to process these petitions, instead advising Save Our Shellfish of its rights to sue the Service, in other words to sue the Federal government.	The Service has responded to two petitions to delist the southern sea otter. The first was submitted in February, 1984, and asserted that the southern sea otter is not a separate subspecies. The second was submitted in July, 1998, and presented no information on the population trends or status of southern sea otter to support the petitioned action. The Service published 90-day findings in response to each petition (49 FR 28583, July 13, 1984; 69 FR 5861, February 6, 2004). Both findings indicated that the petitions did not contain substantial information that the petitioned action was warranted. We were not aware of any petition to delist the southern sea otter submitted in 2006. At the public hearing for this RDSEIS in Santa Barbara on October 4, 2011, we received a copy of the materials mailed to the Director of the Service dated March 4, 2006. The regulations governing the filing of petitions to delist species are found at 50 CFR Part 424, and specifically at section 50 CFR 424.14. If the commenter chooses to file a petition to delist the southern sea otter, the Service will review and respond to it in accordance with the governing regulations. Consideration of a petition to delist the southern sea otter is beyond the scope of the RDSEIS/FSEIS. The Final Revised Recovery Plan for the Southern Sea Otter gives recovery criteria for the southern sea otter and states that the subspecies will be

		considered for delisting under the Endangered Species Act when the average population level over a 3-year period exceeds 3,090 animals (USFWS 2003). The latest available 3-year running average (which includes the 2010 spring count) is 2,711 animals (http://www.werc.usgs.gov/seaottercount). The rationale for the delisting criterion is explained on page 26 of the recovery plan (USFWS 2003).
128	Because the zonal management program is in violation of 7(a)(2) of the ESA, it is not hard to find that the program also violates the Service's affirmative duty to conserve the species under section 7(a)(1) of the ESA to pursue sea otter conservation. The ESA defines "conservation" as "the use of all methods and procedures, which are necessary to bring any endangered species or threatened species to the point at which the measures provided pursuant to this chapter are no longer necessary." The courts construe this duty to be a strong mandate on the Secretary and the Service to not carry out programs adverse to species recovery and conservation. FWS has concluded that containment practices are ineffective and harmful to sea otters, and thus they can no longer be supported as conservation measures for the benefit of the species. Therefore, the Service must discontinue any containment actions and leave all remaining southern sea otters at SNI. Failing to do so would be directly contrary to conservation. Thus, the obligations imposed on the Service under section 7(a)(1) require a complete end to the translocation and containment program.	Our preferred alternative terminates the southern sea otter translocation program, including any containment actions, and retains sea otters at San Nicolas Island.
129	The Service is obligated to act in accordance with the Recovery Plans it develops for listed species. In *Friends of Blackwater v. Salazar*, 772 F.Supp.2d 232 (D.D.C. 2011), the court held that the Service violated the protections of section 4 by deciding to delist a species based on considerations not included in the management actions and conservation and survival goals included in their Recovery Plan. While the Recovery Plan may be a guidance document, the Service is bound by its definitions of "recovery." *Id*. Here, the Recovery Plan acknowledges that the southern sea otter's recovery is dependent on the termination of zonal management and allowing the existing SNI population to remain in its current location. This finding similarly "binds" the Service to act accordingly and finalize the proposed rule.	The purpose and need of the RDSEIS/FSEIS is to complete one high-priority recovery action identified in the Final Revised Recovery Plan for the Southern Sea Otter (USFWS 2003) (Task 5: Evaluate the translocation program in light of changed circumstances and determine whether one or more failure criteria have been met). While we analyze a full range of alternatives, including resuming implementation of the program, we recognize that Alternative 3C reflects the recommendations made by the Southern Sea Otter Recovery Team and afford the best opportunity for sea otter recovery.
130	Congress set forth specific requirements in P.L. 99-625 that would govern the establishment and	Portions of the central California range are now food-limited, which further suggests the necessity of

	implementation of the management zone. One of these requirements is the mandate that the management zone be established so as to "not include the existing range of the parent population *or adjacent range where expansion is necessary for the recovery of the species*." As explained in the legislative history, in creating the zone to provide sufficient room for range expansion the Service "must accommodate, among other important biological needs, the feeding behavior of the sea otter." Thus, foraging, as well as all other biological needs of the sea otter, were required to be taken into account in establishing this zone. The zone boundaries, as currently determined, are not in compliance with these requirements. As stated in the 2003 recovery plan, natural range expansion is necessary to achieve recovery. In addition, the Doak analysis confirms that zonal management will greatly impede recovery and that large numbers of sea otters would have to be moved continuously, resulting in mortality and negative effects on the parent population. Over the ten-year period contemplated by the Service, Dr. Doak anticipates that 393 sea otters would have to be removed from the management zone, resulting in an anticipated 67 deaths.	range expansion for sea otter recovery. Alternative 3C reflects the recovery strategy of allowing natural range expansion.
131	The containment program violates P.L. 99-625, and the Service accordingly must declare it a failure. P.L 99-625(b)(4), in stating the purpose of the management zone, requires that the "Service shall use all feasible *non-lethal* means and measures" to implement the containment policy and remove otters from the management zone (emphasis added). The history of the containment program and the available containment methods and technologies have proven that the capture and removal of sea otters cannot be undertaken by non-lethal means. Many sea otters are certain to die as a result of capture and removal. The Service's 2000 biological opinion notes that "the stress of being captured, held in captivity, and (for some individuals) undergoing surgery to implant tracking devices resulted in a mortality rate that was higher than the anticipated mortality rate of three to five percent (Benz, pers. comm. in Service 1987b) that had been expected to result from the handling of southern sea otters during translocation." The 2000 biological opinion also states that, "[b]y the time of the 1993 draft evaluation, seven southern sea otters had died at Monterey Bay Aquarium while waiting to be translocated to SNI or after surgery to implant radios, three died at SNI while waiting to be	Comment noted. We acknowledge that the level of mortality resulting from the capture and relocation of sea otters was higher than anticipated.

	released, one died after being captured in the parent range for translocation and released at the point of capture, and four died within two weeks of being released after being captured during containment activities." This level of mortality is far higher than what was anticipated when the containment program was developed. The Service's current estimate of expected mortality of 17 percent is far higher than the 1987 biological opinion's estimates of three to five percent, and can in no reasonable way be interpreted as "non-lethal" as required under P.L. 99-625.	
132	There is nothing in P.L 99-625 that requires the removal of the SNI sea otters. P.L. 99-625 only refers to the removal of any sea otters in the *management zone*. The fact that Congress considered whether to require the removal of sea otters after a failure determination, and declined to include the translocation zone in the area from which capture would occur, indicates an intention to allow the animals to remain at SNI. The absence of any statutory requirement for removal of animals from SNI also confirms the discretion available to the Service for this purpose.	Public Law 99-625 authorized but did not mandate the development and implementation of the translocation program. Nor did Public Law 99-625 address the potential failure of the program. The command in the legislation to remove sea otters from the management zone applies while the plan is in effect. By rulemaking implementing the translocation program, the Service specified criteria to evaluate whether the program is a failure and set forth the consequences of a failure determination, which included an obligation to remove sea otters from the management zone and from San Nicolas Island (50 CFR 17.84(d)). By removing the translocation rule in its entirety through the present rule, we are eliminating all of the internal components of the rule at 50 CFR 17.84(d), including the requirements to remove sea otters from San Nicolas Island and from the management zone following a determination that the program has failed. See also our response to comment 121.
	Textual Edits	
133	P. 68 The second paragraph is unclear and misleading. It states that the State of California added a section to the Fish & Game code to prohibit discharge of firearms on SNI. The State can't prohibit the Navy from using firearms on SNI. This paragraph could be interpreted that Navy personnel on SNI were prohibited from using firearms so they wouldn't shoot sea otters. What was probably meant was that fisherman fishing offshore of SNI are not allowed to use firearms. This should be restated to clarify that no firearms are allowed during commercial operations in waters surrounding SNI.	We have made the suggested clarification.
134	P. 50 The RDSEIS makes no mention of white shark attacks as a cause of mortality. In recent years, shark attacks have been the most common cause of mortality for otters in the southern part of the range.	In section 4.3.3.3, p. 49 of the RDSEIS, we state, "Based on analysis of beach-cast carcasses, it appears that the two causes of death most important for limiting population growth are white shark attacks and infectious disease." However, shark-related mortality has increased dramatically in recent years, and new analyses of the patterns and

		implications of this mortality are becoming available. We have updated sections 4.3.3.3 and 6.2.3.3 in the FSEIS to include the most recent information available on shark-related mortality.
135	P. 113 The RDSEIS states that there have been 0 commercial landings of halibut from San Nicolas Island, but Table 6-14 indicates 3,000 and more than 8,000 pounds have been landed in the past two years. Text should be modified to indicate that no "gill and trammel net" landings have occurred.	We have made the suggested correction.
136	P. 274 The RDSEIS should specifically summarize regulatory impact to the Department of Defense, not just the benefits to the Channel Islands National Park and Sanctuary.	We describe the effects of Alternatives 3A-3C on the U.S. Navy/Department of Defense in detail in sections 6.5.11.5, 6.6.11.5, and 6.7.11.5 of the RDSEIS/FSEIS. The paragraph to which the commenter refers is intended to be a brief summary of effects on Federal agencies under Alternatives 3A-3C. Under these alternatives, all Federal agencies, not just the Department of Defense, would be required to consult under Section 7 of the ESA for activities that may affect the southern sea otter. We believe the language as it exists adequately summarizes the effects. Therefore, we have not made any changes in response to this comment.
137	P. 285, Table 6-79 The impacts are to U.S. DOD, not just U.S. Navy and should be indicated as such. "Other mutually agreeable solutions" should be added to the option of a programmatic BO.	We have made the suggested changes.
138	P. 4, Table 0-1 This table should also include the predicted impacts of the "No Action" alternative, otherwise the table could be misleading. For example, if the "No Action" alternative is predicted to result in moderate adverse impacts on abalone, then all that is written under the "Preferred Alternative" is "No Change". This is misleading, because someone who has not read the whole document, or looked at Table 6-78, is logically led to think that "no change" means that the impact of the alternative is neither positive nor negative. The reader may not understand that in some cases, "no change" actually means that the alternative will result in the continuation of a moderate adverse impact. NMFS suggests: "No change from No Action" OR REPEAT Low-moderate (-)	We have clarified that "no change" means no change relative to the no-action alternative.
139	P. 5 The RDSEIS states: "We believe that, on balance, Alternative 3C causes the least damage to the biological and physical environment, in that it would allow a "keystone species" to return to its former range off southern California and would help to restore the natural functioning of the nearshore marine ecosystem." This statement overlooks the fact that the natural functioning of the environment has changed considerably over the last 200 years. In	We have added an acknowledgment of the potential indirect socioeconomic impacts of Alternative 3C, relative to the baseline, to this sentence.

	other words, the clock cannot be turned back so any alternative needs to be considered within current and future activities. For example, what about the damage to the current socio-economic environment that depends on this same system for livelihoods and human food production? NMFS suggests incorporating some reference to the perceived economic impact in this paragraph to offer a more complete picture.	
140	P. 5 Please add NMFS to the list of agencies who should be engaged in the consultations regarding mitigating effects. The assumption that gradual change over decades would likely dampen any regional economic impacts is an assumption that is hard to quantify and very speculative. This assumption does not appear to be adequately addressed in the impact analysis section to warrant its inclusion here. NMFS suggests a more detailed analysis be carried out in the RDSEIS to support this assumption and its inclusion in this paragraph.	We have added NMFS to the list of agencies that should be engaged in conversations regarding mitigating effects. Although we believe it is logical to state that range expansion over the course of decades would likely facilitate a gradual transition of affected industries and thereby dampen any regional economic impacts, we have deleted the sentence from this paragraph as suggested because we agree that it is somewhat out of place in this context.
141	P. 27 The Service should indicate that black abalone are federally listed under the ESA as endangered. The Service should indicate that all abalone species are offered protection by State and Federal regulations depending on the species.	We have made the suggested clarification.
142	P. 28 The RDSEIS states, "These observations revealed that sea otter prey preferences changed over time." This statement is misleading. The Service should discuss why it believes that sea otter prey consumption is mediated by otter preferences versus availability and abundance of prey items. The Service' conclusion that sea otter prey preference is the primary factor controlling consumption assumes that the prey species' abundances have remained relatively constant over this time period (1988-2006). This assumption is likely not valid throughout most of Southern California for the federally listed species of abalone as well as for the abalone on NMFS' species of concern list.	We have clarified our meaning by changing "prey preferences" to "prey consumption."
143	P. 40, Table 4-1 This list is incomplete. ESA-listed sea turtles and other marine mammals should be included on the list as should NMFS' species of concern fishes: bocaccio, cowcod, and basking sharks.	We have made the suggested additions.
144	P. 40 It is important to note that while white abalone are the deepest occurring abalone species, their depth range is from 5-30 m (approx. 16-200 ft). The species is currently most abundant between 30-60 m (100-200 ft).	We assume that the commenter meant that the depth range of white abalone is from 5-60 m (not 5-30 m). We have added that information to section 4.3.3.1.
145	P. 40 Please insert the word current before depth in this sentence: "Predators of white abalone include	We have not added the word "current" as the commenter suggests. Even if white abalone fully

	sea stars, octopus, crabs, lobsters, and fishes such as sheephead, cabezon, and bat rays. Sea otters are important predators of abalone generally, but typical sea otter foraging depths (Tinker *et al.* 2006a, Chapter 6) overlap only partially with the *current* depth range of white abalone."	occupied their potential depth range of 5-60m, this depth range would still overlap only partially with the known typical (95 percent of recorded dives) dive depth range of sea otters in California (approximately 2-20 m for females at the center of the range and 2-40 m for males near Point Conception).
146	P. 42 Please insert a sentence, as was done above for white abalone, regarding the overlap of sea otter foraging depths and black abalone depth range.	On p. 88 of the RDSEIS, we state that "[b]lack abalone inhabit water depths well within the range of sea otter predation." We have added a similar sentence to this portion of the text as the commenter suggests.
147	P. 42 The Service should acknowledge that it was not just overfishing that caused population collapse and local extinctions. NMFS suggests the following additional sentence: "Due to a combination of overfishing and disease (discussed below), the black abalone fishery was closed in 1993 (Neuman *et al.* 2010, Journal of Shellfish Research, Vol. 29, No. 3, 577–586)."	We have made the suggested change.
148	P. 42 The Butler *et al.* 2009 reference is incorrect and should be VanBlaricom *et al.* 2009 throughout the document and in the literature cited section.	We have made the suggested correction.
149	P. 58 NMFS recommends that the RDSEIS description of aquaculture be specific to marine aquaculture and include in the existing definition production of hatchery fish and shellfish grown to market size in ponds, tanks, cages, or raceways and released into the wild. Aquaculture is used to support commercial and recreational marine fisheries as well as to enhance/rebuild wild stocks and habitats (*e.g.,* white sea bass and oyster reef enhancement). While accurate, the aquaculture references included in the RDSEIS seem somewhat dated, and there may be valuable information in more recently published materials. NMFS suggest the Service peruse the shellfish bibliography on the NOAA Aquaculture Program website: http://www.ecsga.org/Pages/Sustainability/AnnotatedBibliography.pdf Expanding sustainable marine aquaculture, (e.g., shellfish aquaculture in California), is a priority identified in NOAA's Ten Year Strategic Plan, NOAA's `National Marine Aquaculture Policy, and the National Shellfish Initiative. There is also a grower in Santa Barbara who is attempting to grow abalone offshore in California State waters. NMFS would encourage the Service to evaluate the likely expanded shellfish aquaculture industry in the RDSEIS as this is a very likely change to coastal communities over the next ten years.	We have made the suggested change to the definition of marine aquaculture and have added the general information provided by the commenter regarding an anticipated expanded shellfish aquaculture industry. We have reviewed the referenced bibliography, but it includes no materials that would provide more recent information on the marine aquaculture occurring in the Southern California Bight than that on which we relied in the RDSEIS. Therefore, we have not updated our discussion of marine aquaculture in the FSEIS to include the suggested references.
150	P. 62 The NMFS Recovery Program for federally listed abalone needs to be mentioned in this section.	We have added a reference to the NMFS-led recovery efforts for white and black abalone to this

	In addition, NMFS is not mentioned as an agency that could be impacted by the proposed action (in particular for abalone, fisheries, *etc.*).	section, though we refer the reader to our analysis of effects on these efforts under the heading "Candidate, Threatened, and Endangered Species."
151	P. 222-223 It is not clear if: (1) the Service is proposing to add sea otters to NMFS' biological opinion for ESA-listed marine mammal species and to NMFS' permit for Navy Activities in the Southern California Range Complex; or (2) if the Service has their own biological opinion for other non-marine-mammal species for Navy activities and this proposes the addition of the sea otter to the Service's biological opinion and issuance of their own permit to the Navy that would be concurrent with NMFS' MMPA permit. In either case, it is not clear in the DSEIS if coordination with NMFS has already been formalized for this action and how the timing for concurrent issuance of the MMPA permit would occur, as NMFS' MMPA permit has already been issued.	We are proposing to add southern sea otters to a Service programmatic biological opinion for other species listed under the ESA and to issue a permit to the Navy under the MMPA that could be processed concurrently with NMFS' MMPA permit should sea otters eventually recolonize San Clemente Island. We do not expect sea otters to recolonize San Clemente Island for some time, perhaps decades. Coordination with NMFS on the timing of our respective permits would occur at that time. We have clarified our meaning in the FSEIS.
152	P. 53, Section 4.4.2.1, paragraph 1 We suggest that "nearshore waters" be defined.	We have made the suggested clarification.
153	P. 53, Section 4.4.2.1, paragraph 1 The Department does not establish and regulate fishery seasons; the Fish and Game Commission does that. We suggest the authors make the correction.	We have made the suggested correction.
154	P. 53, Section 4.4.2.1, last full paragraph We do not understand the purpose of the following statement: "…it is clear that each of these fisheries accounts for only a small proportion of the regional economy, on the order of thousandths of one percent." We suggest that the sentence be rewritten to make the point that potential reductions in fishing effort based on more restrictive regulations, which would be designed to eliminate incidental take of sea otters could significantly and negatively impact some California businesses engaged in commercial fishing or fish processing.	We make this statement in Chapter 4 (Affected Environment) to provide a regional context for the economic effects we describe in Chapter 6, Environmental Consequences. We have not rewritten this sentence to refer to the potential effects of a change in the regulatory status of southern sea otters in southern California because these effects are discussed in Chapter 6.
155	P. 55, Section 4.4.2.3, first paragraph Although there is a reference to the restricted access program the fishery account doesn't mention that in 2005 two-thirds of the existing lobster operator permits became transferable. Over fifty lobster permits have been transferred by their owners to other fishermen. Whenever a permit is transferred to another fisherman the State is paid a fee of $500. The current market price for a lobster permit varies by owner but starts at $50,000-75,000, and has gone higher. We suggest this section be updated.	We have added information regarding the transferability of permits to this section.
156	P. 55, Section 4.4.2.3, first paragraph Department permit prices refer to baselines which are annually adjusted upward by a mandated formula involving	We have removed the outdated permit prices.

	the inflation rate. We suggest this section be updated.	
157	P. 57, Section 4.4.2.6 We suggest a change to the paragraph as follows: "With respect to southern California, it prohibits the use of gill and trammel nets in waters less than 70 fathoms or within one mile, *whichever is less*, around the Channel Islands, and generally prohibits the use of gill and trammel nets within three nautical miles offshore of the mainland coast from Point Arguello to the Mexican border (Marine Resources Protection Act 1990)." This regulatory language is contained in Fish and Game Code Section 8610.2.	We have made the suggested change.
158	P. 57, Section 4.4.2.6.1 Due to the subject matter of the document, the term "otter trawl" should be changed to "bottom trawl," a term that is more commonly used, and that will prevent misunderstandings.	We have made the suggested change.
159	P. 57, Section 4.4.2.6.1 We suggest a change to the sentence that adds the following italicized words. "The recreational fishery is pursued using hook-and-line *and spear gun*.	We have made the suggested change.
160	P. 57, Section 4.4.2.6.2 We suggest a change to the sentence that adds the following italicized words: "Landings have fluctuated between millions of pounds and fewer than 45,000 kg (100,000 pounds), with a general trend of decline *from 1959 to 1982, and a general trend of increase during the past decade*."	We have made the suggested change.
161	P. 57, Section 4.4.2.6.2 We suggest a change to the sentence that adds the following italicized words. "Currently, most white seabass are caught in the Southern California Bight, *although in 2010 and 2011 significant landings have occurred in central California.*"	We have made the suggested change.
162	P. 57, Section 4.4.2.6.2, last sentence We suggest a change to this sentence as follows: "A White Seabass Fishery Management Plan was adopted in 2002 by the Fish and Game Commission. Every year CDFG prepares an annual report for the Commission with a review of the fishery and status of the resource."	We have made the suggested change.
163	P. 91, Section 6.2.4, paragraph 2 "This potential closure would likely affect the commercial gill net halibut and white seabass fishers." It is unclear whether the last word refers to fishermen or to the fisheries.	"Fishers" is a typographical error. We have replaced it with "fisheries."
164	P. 111, Section 6.2.4.6 It is not clear how estimates could be made for sea otter mortalities from 1995 to 1998 when there was no observer program. It is also not clear if the mortality estimates apply only to	We have added information to this section to clarify these statements.

	Monterey Bay or to the entire state. It is not clear if the greater gill net depth restriction to 60 fathoms was made specifically to protect sea otters or to protect marine birds or other marine mammals. We suggest that the authors provide more information to clarify the general statements in this Section.	
165	P. 111, Section 6.2.4.6 "Fishing with gill and trammel net gear in areas not already affected by the existing closure but within the depth ranges used by sea otters could potentially be affected by an additional closure if the regulatory environment changed as a result of selection of one of the alternatives under consideration and the State chose to act to protect sea otters from potential incidental take." This sentence seems long and is difficult to understand. We suggest the authors rephrase the thought to make it clear.	We have made the suggested clarification.
166	P. 114, Table 6-14 In the table in 2006, landings from the San Nicolas Island area are reported as zero, yet there is an ex-vessel value of $11,000. We suggest the authors resolve this discrepancy.	We have made the suggested correction.
167	P. 117 "The primary types of gear used to catch white sea bass include gill nets, round haul nets, and hook-and-line." We suggest you remove "round haul nets" from the gear types. The use of round haul nets and purse seine to take white seabass was prohibited in 1940.	We have made the suggested change.
168	P. 117 We suggest adding the word italicized below. "The annual *white* seabass harvest using gill or trammel net gear also followed the increase in landings."	We have made the suggested change.
169	P. 118 We suggest adding the words italicized below. "San Nicolas Island. White seabass landings around San Nicolas Island have been minimal over the last 20 years. In 2009, white seabass landings *from around* San Nicolas Island were 3,279 pounds."	We have made the suggested change.
170	P. 227, Section 6.6.3.1 The first paragraph of this section states that "Within 1 0 years, this removal may prevent some predation on shallow-living white abalone that may be present along the mainland coastline (from Point Conception to Carpinteria or Oxnard) or at San Nicolas Island…." This is not the case under Alternative 3B because the alternative seeks to only remove otters from the translocation zone (SNI) and not from the management zone. Otters residing along the mainland coast from Point Conception south will remain and thus may have an effect on any shallow living white abalone along that coast. The second paragraph also refers to the removal of otters along the mainland coast within the management zone which this alternative does	We have made the suggested correction.

	not do. Thus there is no long term benefit to white abalone from otter removal for the mainland as stated. We suggest the authors correct this section accordingly.	
171	P. 276, Table 6-78 There is an error in the description of the biological impacts for white abalone under alternatives 3A and B. The table lists the same impacts for Point Conception to Carpinteria or Oxnard as the No Action alternative for the first 10 years, which is not correct. Alternative 3A would have the same benefit to shallow living individuals as in Alternative 1 in the mainland coast area. Alternative 3B does share the same impact as the No Action alternative. We suggest the authors correct this section accordingly.	Under Alternative 1, the management zone would be enforced, and all sea otters would be removed in perpetuity. Under Alternative 3A, reasonable efforts would be made to remove sea otters from San Nicolas Island and the management zone at the time the decision to terminate the program was made, but no effort would be made to enforce a management zone once these two tasks were completed. Alternative 3A would then allow sea otters from the parent population to recolonize historic range throughout the Southern California Bight. The removal of sea otters from the management zone under Alternative 3A would likely have only very localized and minor effects on white abalone compared to the baseline (No Action Alternative) because sea otter densities north of Point Conception would likely be sufficient to maintain expansion of the population into this area, and sea otters moved out of the management zone would be capable of rapidly returning. Because the effects of removing sea otters from this portion of the mainland coastline are expected to be so slight, we do not distinguish between the effects of Alternatives 3A and 3B in this summary table. Therefore, we have not made the suggested change.
172	P. 288, Section 6.9.3.1 The third paragraph of this section mentions the possible spread of WS through aquaculture and outplanting. The specific sentence states the following: "Withering syndrome is spread largely by means other than aquaculture, but aquaculture facilities contributed to the spread of withering syndrome through the outplanting of infected individuals to the wild (74 FR 1937)." Although this statement is true, it is misleading in the context of the decline of black abalone. The original reference that this statement is derived from is a paper by Friedman and Finley (2003). In that paper they report the possible spread of the disease through two separate red abalone out planting events in northern California. These two out planting events occurred outside of the black abalone geographic range and thus did not contribute to the cumulative impacts of decline of black abalone. We suggest the authors add a clarifying sentence or remove this reference.	We have removed the reference as suggested.
173	The initial Regulatory Flexibility Analysis suggests that if an area is closed to gill and trammel net fishing, we can just go somewhere else to fish or use	We have removed these statements from our analysis of effects on the gill and trammel net fisheries for halibut and white seabass in the final

	other gear. We can't do that anymore. Fisheries are all limited entry. You also suggest that we're going to save money on fuel by not fishing in the area. Right now I burn 8-15 gallons a day fishing local off of Santa Barbara, and if I were forced to fish outside of the area I would be burning at least twice that. These statements in the initial Regulatory Flexibility Analysis are not correct.	Regulatory Flexibility Analysis.

TABLE G-2. COMMENTERS REPRESENTING ORGANIZATIONS WHO SUBMITTED COMMENTS BY MAIL OR EMAIL

Commenter	C/R
Association of Zoos and Aquariums, Steven G. Olson	1
California Department of Fish and Game, Charlton Bonham	8, 9, 22, 83, 84, 85, 86, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172
California Sea Urchin Commission, David Goldenberg	5, 6, 9, 13, 14, 19, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 50, 51, 62, 63, 64, 65, 66, 95, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 116, 120, 124, 125
Capitola City Council	2
Center for Biological Diversity, Miyoko Sakashita	1
City of Capitola, Michelle Deiter	2
Department of the Navy, Donald R. Schregardus	4, 88, 89, 90, 91, 95, 96, 123, 133, 134, 135, 136, 137
Endangered Habitats League, Dan Silver	1
Environmental Defense Center, The Otter Project, Brian Segee	1, 60, 61
Environmental Protection Agency, Kathleen M. Goforth	1, 7
Friends of the Sea Otter, Defenders of Wildlife, The Humane Society of the United States, the Monterey Bay Aquarium, and the Oceans Public Trust Initiative, Emily Merolli	1, 21, 52, 53, 81, 82, 92, 110, 111, 112, 119, 128, 129, 130, 131, 132
Gray Whales Count, Michael H. Smith	1, 26
IUCN-SSC Otter Specialist Group, Nicole Duplaix	1, 12, 24, 118
Marine Mammal Commission, Timothy J. Ragen	1, 121, 122
Member of Congress, Lois Capps	1, 48
Member of Congress, Sam Farr	1
Monterey Bay Aquarium, Julie Packard	1
National Oceanic and Atmospheric Administration, Steve Kokkinakis	15, 16, 40, 41, 42, 43, 44, 45, 67, 68, 69, 70, 71, 72, 73, 74, 102, 113, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151
Santa Barbara Channelkeeper, Michael Sheehy	1
Santa Barbara County, 1st District Supervisor, Salud Carbajal	1
Santa Barbara County, 2nd District Supervisor, Janet Wolf	1
Santa Barbara County, 3rd District Supervisor, Doreen Farr	1
Santa Barbara County Fish and Game Commission, Bill Warnekros	3, 23, 94, 120
Santa Cruz City Council	2
Santa Cruz County, 5th District Supervisor, Mark W. Stone	1
Santa Cruz County Board of Supervisors	2
Santa Monica Baykeeper, Brian M. Meux	1, 26, 46
Save Our Shellfish, Lad Handelman	18, 115, 126, 127
The Otter Project, Ocean Conservancy, Save Our Shores, The Marine Mammal Center, Oceana, Sierra Club-Santa Lucia Chapter, C. Bradley Hunt, *et al.*	1, 24
Wildcoast, Serge Dedina	1, 26

TABLE G-3. INDIVIDUALS WHO SUBMITTED COMMENTS BY MAIL OR EMAIL

Commenter	C/R
Abbott, Cindy A.	2
Ackerstein, Dan	1
Alexander-Larson, M. L.	2
Alloy, Richard	1
Aminzadeh, Sara	1
Applebaum, Doris	1
Archbold, John J.	2
Arnold, Katie W.	1
Artemoff, Angelina	2
Artzt, Alice	2
Ausman, Candi	1
Avery, Carolyn L.	2
Ayer, William W.	2
Bagatta, Joanna	1
Bagnani, Jerry	1
Bailey, Brenda	1
Balint, Christine R.	2
Barnes, Sarah J.	1
Barrish, Theodore H.	2
Bartell, Karen H.	1
Beames, Martha L.	2
Beguhl, Phillip	23
Bein, Hilary A.	2
Belanger, Brigitte	1
Bell, Patty	2
Belmain, Tami A.	1
Bennett, Michael	2
Berg, Janice I.	2
Berlin, Nicole	2
Bevil, Jr., Lamar C.	1
Bevil, Kim And Lamar	1
Black, Angela	1
Black, Angela	1
Blakely, Jeanie	2
Boccagna, Emilia Jr.	1
Bolton, Clive D.	2
Boster, Carol D.	1
Boster, Karna	1
Boster, Paul	1
Bowers, Anita M.	2
Bramlette, Jenny M.	1
Bramlette, Jenny M.	1
Brewster, Allison	1
Bromfield, Sally	2
Brozina, Zora	2
Bruckner, Susan	2
Bulger, Debbie	1
Burke, Gary	93
Burke, Joanne E.	2
Butner, Cheryl	2
Cachopo, Patricia	1
Capozzelli, J.	1
Capozzelli, J.	1
Capuano, Joyce	1
Carano, Deanne	1
Carlson, Judith B.	1
Cattell, June T.	1
Cauldwell, Heather	1
Chaffin, Janis L.	2
Chandler, Debora	2
Chang, Patricia L.	1
Chase, Linda C.	2
Chavez, Andreas	2
Chrisman, Wendy	1
Claypool, Jonathan A.	1, 26
Cleven, Dennis L.	2
Cobb, F.	2
Cobb, F.J.	1
Cole, Thomas	2
Colorio, Ginamarie	1
Comins, Justin	1
Comstock, Chandra	2
Connors, Sue	1
Corbelli, Carolyn	1
Correa, Nancy	1
Costa, Karen M.	2
Coulombe, Harry N.	2
Council, Nina	2
Covell, Sandi	1
Covert, Jennifer	1
Crawford, Shelby	1
Crisona, Nancy	2
Cuda, John R.	1
Cunningham-Welsh, Mary	2
Curtis, C.	2
D'Andrea, Tara	2
Davis, Di Anne	1
Davis, Lianna L.	1
Dayton, Ruth A.	1
Deaso, Alicia E.	1
Dein, Robin E.	1
Dekeater, Stephen	2
Delauro, Joan	1
Delgado, Debbie	2
Deuth, Mary A.	2
Dinkel, Sharyl A.	1
Donohue, Peter P.	2
Dooling, Gretchen Dooling	2
Doutre, Emily	1
Drake, Carolyn F.	1
Dreher, Angela R.	2
Dunton, Lorri A.	2
Dupray, Cindy L.	1
Dupray, Cindy L.	1
Duran, Monica, et al.	1, 2
Ebrahimian, Babak	2
Eddie, Gloria J.	1
Edgington, Andrea	1
Eliot, John	1
Embry, Judith E.	1
Emerich, Barbara	2
Emory, Katharine	1
Enwright, Khalda	1
Erb, Patricia	1
Estes, Matthew T.	1
Esteve, Gregory V.	1
Esteve, Gregory V.	1
Eury, William J.	2
Ewing, Mary	1
F, Lia	1
Fabbre, Vanessa D.	2
Farina, Beverly	1
Fawley, Alan	1
Fay, Rick	2
Fay-Feder, Peg	1
Feinglass, Samantha F.	1

Felker, Ginamarie	2
Fergus, Jean P.	1
Fergus, John C.	1
Ferguson, Cathie	1
Fonfa, Ann E.	1
Fontaine, Christine	1
Foss, Emily	1
Fountain, Janet C.	2
Fox, Andrea	2
Franco, Jordan	2
Frank, Harriette M.	1
Franklin, Jerry	1
Frick, Greg	1
Gaede, Marnie W.	1
Garcia, Dena	1
Garner, Virginia	2
Gialketsis, Ally E.	1
Giese, Mark M.	1
Giese, Mark M.	1
Giese, Mark M.	2
Gilbert, Camille	1
Gilbert, Camille	1
Gilbert, Linda	1
Glaser, Phillip	2
Goldberg, Lynn	1
Golding, Richard	1
Golding, Richard	1
Goldrick, John	2
Gong, Melissa	2
Goodman, Micah	2
Grant, Aaron	2
Grawunder, Marc	1
Griley, Steven, et al.	1
Grimsinger, Ray	1
Grimsinger, Ray	1
Guglielmo, Nick	54
Gutierrez, Shirley	2
Guzman, Jennifer M.	2
Haines, Jeff	1
Haines, Mary W.	2
Halbeisen, Margaret	2
Hale, Angela	1
Hall, Katie	1
Harden, Ronald D.	1
Harlan, Susan E.	1
Harris, Charles	2
Harris, Deborah	1
Harris, Zoe	2
Harrison, Emily	1
Harrod, Dawn M.	1, 2
Harvey, Joe	1
Hattori, Lisa M.	1
Hebert, Chelsey	75, 76, 77
Hennessy, Eileen	1
Henning, Ann	2
Henrenk , Mary	1
Hernandez, Nicholas	1
Hiltman, Matt P.	1
Hilton, Kay	1
Hinebaugh, Margaret	1
Hoot, Justin	1
Hopkinson, Susan B.	1
Hornaday, Jeffrey	1
Hornberg, Jean	2
Horstmann, Sue	2
Horvath, Karen J.	1
Hoss, Catherine E.	2
Houlihan, Heather	1
Hovsepian, Cindy L.	1
Hovsepian, Jeffrey	1
Howard, Bobbie	2
Howie, Jana	1
Huck, Alexandra I.	1
Huelsenbeck, Matthew W.	2
Hum, Carol L.	1
Hunt, Kristy	1
Hutchison, Kristi	1
Ittner, Mary Sue	2
Ives, Barbara	1
Jagger-Pollon, Cat	2
Jasper, Frank & Sanda	2
Johnston, Stephanie	1
Joines, April	2
Jordan, Barbara	2
Jorgensen, Diana J.	2
Kahtalian, Lais L.	1
Kane, Caitilin	1
Karcher, Elisabeth	1
Kennan, Eden	1
Kerins, Nancy K.	2
Kevin, Susan	2
Kieckhefer, Thomas R.	2
Kirita, Nancy M.	2
Kline, Stephanie J.	1
Knights, Lindsay	1
Knourek, Robert	2
Kopczak, Charles D.	2
Kousek, Rock A.	1
Koza, Gail	1
Lacey, Victoria M.	1
Ladd, Wilbur N.	117
Ladyman, Juanita	1
Lambropoulou, Maria A.	2
Lawyer, Lisa	1
Lechtanski, Cheryl	2
Lee, Megan	1
Lee, Megan D.	1
Leiseroff, Miriam, et al. F.	1
Letkemann, Bryan R.	2
Lewis, Chani L.	1
Lewis, O.	1
Lillegraven, Jason & Linda	1
Lima, Christopher	1
Link, Connor	2
Lowe, Sara J.	1
Luke, Mary Ann	1
Luke, Mary Ann M.	1
Lulick, Dottie J.	1
Lunardi, Brian J.	2, 49
Lyons Kalmenson, Karen	2
Mabry, Rebecca M.	2
Macdonald, Catharine A.	1
Madden, Susanne M.	2
Maing, Michelle	1
Malbin, Irene L.	2
Marks, Diane D.	1
Marshall, James P.	9
Martin , Kelly, et al.	1
Martin, Jason C.	2

Martin, Phyllis J.	1
Martinez, Jacqueline, et al.	1, 2 , 26
Martini, Denise A.	2
Mast, James	1
Mathews, Deb	1
Matthews, Georgianne E	2
Maurer, Kim	1
Mcclelland, Lila K.	1
Mcdevitt, Mary	1
Mcfadden, John T., et al.	1
Mcglone, Gail	1
Mckay, Emily D.	1
Mclaughlin, Lea C.	2
Mcneeley, John D.	2
Mcspadden, Sandi	1
Melville, Erica, , et al.	1
Menjivar, Stephanie	2
Metzger, John	1
Minalga, Cecilia	2
Mitteldorf, Harriet M.	2
Mojallali, Anna G.	2
Montapert, Anthony	2
Montapert, Anthony E.	1
Moody, Kristel	2
Moore, Marilyn D.	1
Morreale, Lorinda	2
Morreale, Lorinda J.	1
Moss, Ruth	1
Mostov, Elizabeth	1
Murphy, B.J., et al.	1
Myers, Shelley M.	1
Nedorost , Marilyn	1
Nissen, Brad	2
Noah, Ian S.	1
Nowell, Lee	1
Nyberg, David	1
Nyberg, Nancy O.	1
O'Donnell, Patrick J.	2
Oelker, Gregg	1
O'Neill, Caraa	2
O'Neill, Susan	1
Oneill, Valjean F.	1
Orcholski, Gerald	1
Orcholski, Gerald	1
Ottmann, Daisy	2
Ozkan, Dogan	1
Packer, Patti	1
Palmer, Anne	2
Panton, Lisa E.	2
Parlow, Eileen	1
Parrish, Ange	2
Pearson, Daniel H.	2, 47
Peddy, Jan E.	2
Pedraza-Tucker, Liette	1
Pennington, Edi, et al.	1
Penso, Amee	2, 26
Perkins, Joel	1
Perlman, Frances	2
Piatt, Greg	1
Pinfield, Roisin	2
Plaster, Deane	1
Platizky, Franklin	1
Platte, Leigh R.	2
Polesky, Alice	1
Polick, Melissa N.	2
Polite, Christine C.	2
Pollon, Cat	2
Pometta, Tawnia	2
Potter, Donald J.	1
Potvin, Phillip	2
Powell, Deborah H.	1
Prakash, Shiva	2
Pulsifer, Diane	1
Pupich, Lou M.	1
Pynn, Judith	2
Rasmussen, Andrew	10, 54, 55, 56, 57, 58, 59, 75, 76, 77, 87
Reber-Thomason, Arianna L.	1
Rebuck, Steven L.	17, 27, 36, 78, 79, 108, 109, 114, 126, 127
Reich, Andrew	1
Renner, Teresa J.	2
Rhea, Vicki	2
Rhodes, Janet L.	1
Rickenbach, Deborah J.	1
Robello, Carol	1
Roberts, Kayleigh N.	2
Roberts, Peter M.	2
Robson, Lori	1
Romero, Patty L.	1
Rosenberg, Evan R.	1, 11
Rosengard, Lise	1
Rowe, Aliza F.	1
Rowntree, H.	1
Ruehle, Laurel L.	1
Ryan, Rebecca H.	1
Ryan, Richard	1
Sandel, Norman	1
Sanders, Mary L.	2, 25
Schlamm, Rhoda	1
Schlamm, Rhoda	2
Schoenfield, Rick	2
Schuller, Terry	1
Schwary, K.	1
Scott, Jane	1
Scribner, Susan M.	2
Seip, Ann	1
Shannon-Chapple, Maureen	2
Sheehan, Francis A.	2
Shenk, Joan W.	2
Sheppard, Benjamin	1
Sherman, M.	1
Sherman, Roberta	2
Shimata, Kathy	2
Shnayder, Veronica	2
Shreiner, David R.	2
Sidenstecker, Maris	2
Sidenstecker, Maris A.	1
Silva, Rene	2
Silver, Margaret	1
Silver, Ron	1
Simpson, Diane C.	2
Simpson, Sally A.	1
Smith, Gregory	2
Smith, Shelagh A.	1
Smith, Susan E.	2

Snitzer, Eileen	1
Sonntag, Kathleen S.	1
St. John, Elizabeth N.	2
Staby, Carolyn	1
Startzman, Lyn L.	2
Stevens, Shirley, et al.	1
Stewart, Sandra	2
Stier, Nancy E.	2
Stoneman, Nicki A.	2
Storey, Kimberlee D.	1
Stuart , Norma	1
Stulz, Susan	1
Sullivan, Deidre	2
Sutton, Mayra	80
Sutton, William L.	75, 76
Swierkosz, Joseph W.	2
Szaszorowska, Anna S.	1
Szaszorowska, Magdalena	1
Talamantes, Maria	1
Taylor, Pete F.	2
Tazi , Mohamed, et al.	2
Thompson, Cindy A.	1
Thorne, Trischa B.	1
Tokuhara, Mayumi	2
Torgenrud, Cameron	2
Trenner, Anita K.	1
Tunney, Lisa M.	2
Turner, Lezlie J.	1
Uchiyama, Catherine	2
Urban, Michelle O.	2
Valentine, Jennifer	2
Valentine, Jennifer J.	1
Valncia, Joyce E.	1
Van Iderstine, Nancy	1
Van Leekwijck, Natalie	1
Vann, Nicole E.	1
Varellas, Barb A.	2
Ventura, Vicki L.	2
Versaci, Loredana	1
Villette, Sonia M.	1
Vitaia, Rasa	1
Voss, Alison	1
Wagner , Megan, et al.	1
Walker, Hannah L.	2
Wall, Mary K.	2
Walwyn, Wendy M.	2
Weiland, Sherry L.	1
Welsh, Caitlin A.	1
Wertz, Barbara	2
White, Jon R.	2
White, Maria	1
Whitehead, Carole G.	2
Williams, Chris	2
Williams, Mary	1
Williams, Mary	2
Williams, Mary B.	1
Wilmarth, Terry	75, 76, 77
Wilson, Karin	2
Winholtz, Betty	1
Wirkman, Deb	2
Woodzy, Doug E.	2
Wylde, Nancy	1
Zachary, Valerie	1
Zechar, Corwin	1
Zucker, Becky	1
Zucker, Marguery L.	2

TABLE G-4. COMMENTERS REPRESENTING ORGANIZATIONS AND INDIVIDUALS WHO SUBMITTED COMMENTS AT PUBLIC HEARINGS

Commenter	Representing	C/R
Badger, Jennifer	self	1
Bartels, Laurel	self	1
Beguhl, Philip	self	3, 56, 58, 94, 118.5, 120
Betts, Jerome	self	n/a
Birney, Kristi	Environmental Defense Center	1
Burke, Gary	self	56, 58, 76, 93, 173
Carlson, West	self	n/a
Carter, Amy	self	1
Cebulla, Alison	self	2
Celic, Carol	self	1
Chaffin, Janis	self	1
Colgate, Brian	self	80
Colomy, Jim	self	3
Conley, Theresa	self	1
Curland, Jim	Monterey Bay Aquarium, Friends of the Sea Otter, The Humane Society of the United States, Oceans Public Trust Initiative, Defenders of Wildlife	1, 81, 109.5
David, Aimee	Monterey Bay Aquarium	1
Gaffney, Kaitilin	Ocean Conservancy	1
Gilliland, Matt	self	1
Goldenberg, David	California Sea Urchin Commission	9, 27, 28, 31, 33, 34, 38, 39, 100, 101
Grover, Jamie	self	2
Halmay, Peter	self	6.5
Handelman, Lad	Save Our Shellfish	126, 127
Harrold, Chris	Monterey Bay Aquarium	1
Hebert, Curtis	self	54
Hendriks, Julie	self	n/a
Hill, Amy	self	1
Hoeksema, Andrew	Save Our Shores	1
Hunt, Brad	The Otter Project	1
Liquornick, Harry	California Sea Urchin Commission	6, 9
Lutterman, Jason	Friends of the Sea Otter	1
Marcus, Len	self	9
Matejcek, Patricia	self	1
McCarty, Maureen	Santa Cruz County Supervisor Mark Stone	1
Meredith, Michael	self	1
Meux, Brian	Santa Monica Baykeeper	2, 46
Miller, Chris	Board of Trustees for Friends of the Sea Otter	1
Mooney, Don	Friends of the Sea Otter	1

Nelson, Chris	self	n/a
Paolini, Debbie	self	2
Pofahl, Katie	self	1
Rasmussen, Andrew	self	54, 173
Rebuck, Steve	self	17, 78, 114, 127
Robin, Lois	self	2
Rose, Inga	self	1
Rosenberg, Evan	self	1, 11
Sadrpour, Nick	Heal the Bay	2
Scoles, Robert	self	1
Segee, Brian	Environmental Defense Center	2
Shimek, Carolyn	The Otter Project	2
Shimek, Steve	The Otter Project	1, 60, 118, 118.5
Steele, Bruce	self	92.5, 93.5, 100, 101, 118.5, 120
Sutton, Bill	self	54
Sutton, Mayra	self	80
Villa, Nick	self	59
Voss, Chris	self	5.5, 94
Wagner, Elissa	self	1
Welden-Smith, Elizabeth	self	1
Welden-Smith, Mark	The Otter Project	1
West, Daryl	self	2
Williams, Kim	self	1

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