United States Department of the Interior

FISH AND WILDLIFE SERVICE
Anchorage Fish and Wildlife Field Office
605 W. 4th Avenue, Rm. G-61
Anchorage, Alaska 99501

IN REPLY REFER TO:
AFWFO

Memorandum November 22, 2013

To: Chief, Branch of Permits, Division of Management Authority

From: Chief, Endangered Species Branch, Anchorage Fish and Wildlife Field Office

Subject: Division of Management Authority's renewal of scientific research Permit #PRT067925 issued to U.S. Geological Survey (USGS) for take of northern sea otters

Thank you for your July 11, 2013, request for formal consultation pursuant to section 7(a)2 of the Endangered Species Act of 1973 (as amended, 16 U.S.C. 1531 et seq.; ESA). The Division of Management Authority (DMA) proposes to reissue a Marine Mammals Protection Act permit (PRT067925) to the U.S. Geological Survey (USGS) to allow take of the southwest Alaska distinct population segment of northern sea otter (*Enhydra lutris kenyoni*, listed as threatened in 2005). All activities will be associated with research authorized under section 10(a)(1)(A) of the ESA. The attached biological opinion (BO) addresses the effects of research and conservation efforts on the DPS, and, as per our telephone conversation on November 21, 2013, concurs with your determination that the proposed activities are not likely to adversely affect threatened Steller's eiders (*Polysticta stelleri*) that are distributed within the action area. It is based on information provided by DMA, the applicant, published literature, and sea otter experts. The BO documents the Anchorage Fish and Wildlife Field Office's (AFWFO) analysis of effects and finding that **the proposed activities will not jeopardize sea otters or result in adverse modification of sea otter critical habitat**. The attached Incidental Take Statement identifies reasonable and prudent measures to reduce the amount of take.

The history of this consultation is as follows:

- The USGS requested DMA and section 10 authorizations for research on sea otters in 2008.
- The AFWFO received a request for consultation and issued a 5-year BO (consultation #2008-0079) the same year.
- Research was again proposed for 2013 through 2018.
- The DMA assessed the potential impacts and found there would be no effect to sea otters from work conducted in 2013; the permit was reissued contingent upon receipt of a BO prior to beginning work in 2014.
- In July, 2013, the AFWFO received a request for consultation for work in 2014 through 2018.

A complete administrative record is on file at the AFWFO.

We thank you for your cooperation in meeting our joint responsibilities under the ESA. If you have any questions concerning our review, please contact me at Ellen_Lance@fws.gov or 907-271-1467.

Attachment: Biological Opinion

Biological Opinion and Incidental Take Statement
For
Division of Management Authority's
Scientific Research Permit #PRT067925 for Take of Northern Sea Otters (*Enhydra lutris kenyoni*)
(Reference Number 2013-0115)

Prepared by:
Anchorage Fish and Wildlife Field Office, U. S. Fish and Wildlife Service
605 W. 4th Avenue, Anchorage, AK 99503
November 20, 2013

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BIOLOGICAL OPINION

PROPOSED ACTION

Project Description

The Division of Management Authority (DMA-the action agency) is reissuing a Marine Mammals Protection Act (MMPA) authorization (PRT067925) covering various research and population monitoring activities for the threatened southwest Alaska distinct population segment (DPS) of northern sea otters (*Enhydra lutris kenyoni*, hereafter "sea otter"). The permit applicant is the U.S. Geological Survey (USGS). The principal investigator (PI) is Brenda Ballachey. The DMA permit will provide authorization under section 10(a)(1)(A) of the Endangered Species Act (ESA) for take associated with the proposed activities.

The project will monitor population trends and life history variables to identify critical factors influencing survival, recruitment, and recovery of sea otters from the listed DPS. Studies will involve capture, blood and tissue sampling, external and/or subcutaneous tagging, and surgical implantation of radio or satellite telemetry transmitters. Take, as authorized and conditioned by the permit and defined by the MMPA, will include up to 70 listed sea otters per year for five years (total of 350 takes) during capture and handling activities, and incidental lethal take of one of these animals per year (up to five incidental lethal takes). Captures of sea otters would be conducted in spring, summer, and early fall.

Year-round activities will include retrieval of sea otter carcasses for forensic necropsies. Collection of carcasses will have no effect on sea otter populations or habitat and will not be discussed further. Complete project details are included in Ballachey (2013).

Steller's eiders (*Polysticta stelleri*), which were listed as threatened under the ESA in 1997, have a similar distribution during winter as the southwest DPS of sea otter, and they may be disturbed by some of the proposed activities covered under the DMA permit. However, less than 1% of all of the Steller's eiders on the wintering grounds are believed to be of the listed, Alaska breeding population, and they are generally expected to occur within the action area only between October and April. Therefore, because few if any listed Steller's eiders will overlap in time with the proposed activities the probability that a listed Steller's eider will be adversely affected are extremely low. Thus, we concur with your determination that this proposed permit it is not likely to adversely affect Steller's eider; as such, they will not be discussed further in this BO.

Applicant-Proposed Impact Avoidance and Minimization Measures

Standard operating procedures were developed and approved by USGS, the Alaska SeaLife Center (ASC), and the Institutional Animal Care and Use Committee (IACUC) to minimize the risk of injury and harassment to sea otters. The applicant has incorporated these or similar measures into the project to reduce impacts to sea otters:

1) Stress and hyperthermia are the main factors that can cause harm or death of sea otters during capture. The following procedures will be followed to minimize these factors:
    a) Capture and handling time will be minimized as much as possible using such measures as locating the support vessel close to capture locations.
    b) Captured animals will be continually monitored for unusual breathing or vocalizations.
    c) While in transport boxes, otters will be kept cool at all times (shaded, sprayed with cold water or suspended shallowly in sea water) to avoid overheating.
    d) Mothers with pups will be housed together or in adjacent transport boxes at all times while awake, and will be released together.
    e) Otters will only be subject to this activity once; if the same otter is captured more than once it will immediately be released.

f) If female pup pairs are captured together, they will be released together. In the event that a pup is captured and not the mother, the pup will be immediately released without sampling.
g) Pain blockers (narcotic) and a sedative (benzodiazepam or fentanyl) will be administered to alleviate all pain and distress during sampling, tagging, and implantation procedures. Depth of anesthesia will be monitored by standard techniques (respiration and heart rate, muscular movement, vocalization) and additional anesthesia administered if necessary.
h) Upon reversal from drugging, sea otter will be released in close proximity to the capture site.
i) Body temperature will be continually monitored. Appropriate preventative measures will be taken as required (e.g., ice cubes wrapped in wet towels and placed on flippers if above 38° C, towel dried and covered if below 35° C, and immediate termination of all procedures if 40° C or higher).
j) If any signs indicate the animal is in critical condition, emergency procedures will be initiated. These include administration of the antagonist, masking with high flow pure oxygen, and administration of epinephrine and/or doxiprame by the attending veterinarian.

2) A sea otter may be injured during capture by being bitten by another sea otter if in close contact. The following preventative steps will be taken to avoid bites and minimize the effects:
a) Nets will be monitored at all times and individuals that are caught will be immediately removed.
b) If a sea otter is bitten, the wounds will be cleaned and treated.
c) Antibiotics will be used help to prevent infections following any inadvertent injuries.
d) If an injury is severe enough to require long term medical care, the sea otter will be taken to the ASC for rehabilitation.
e) If an animal's condition is terminal, chemical euthanasia will be used to end suffering.

3) Surgical procedures including biological sampling and implantation of radio transmitters may cause infection, leading to sickness or death. These actions will be taken to reduce risk of infection:
a) Tables used as surgical surfaces will be covered in clean plastic.
b) The incision site will be thoroughly cleaned and sterilized with betadine.
c) A sterile contact drape will be adhered to the otter's abdomen and thorax to create a sterile field.
d) Sterile gloves will be used for each operation and all instruments pre-sterilized in surgical packs.
e) After all pre-sterilized packs are used instruments will be cold sterilized with Cidex or sterilized with a pressure cooker between surgeries.
f) Transmitters will be gas-sterilized in surgical plastic bags with ethylene oxide, properly aired and stored unopened until used.
g) Broad spectrum antibiotics (penicillin or amikacin) will be administered prior to releasing each otter. A cephalosporin antibiotic may also be given if contamination is suspected.

4) Release prior to sufficient recovery may increase an otter's susceptibility to harm or injury. To avoid this possibility, the following actions will be taken:
a) An antagonist (Naltrexone) will be administered intramuscularly and/or intravenously after surgery to reverse the initial anesthetization.
b) The otter will be allowed to recover inside a capture box until alert and active.
c) The otter will be released into the water near the site of capture as soon as possible once the veterinarian determines the animal is ready for release, usually within 10 to 20 minutes.

5) All personnel on the project will be required to complete IACUC training to encourage appropriate and humane handling of otters.

Action Area

The action area is determined based on consideration of all direct and indirect effects of the proposed action, and other activities that are interrelated or interdependent with that action on the species and its critical habitat. Indirect effects are those that are caused by the proposed action and are later in time, but are reasonably certain to occur. The specific sampling locations have not been determined, but the action area will include all areas in which work on the southwest DPS of the sea otter may occur under the DMA permit. Potential study areas include the Alaska Peninsula, Kodiak archipelago, Kamishak Bay, and the Aleutian Islands. [Top]

STATUS OF THE SPECIES

Species Description

The sea otter is in the family Mustelidae and the only species in the genus *Enhydra.* Three subspecies are recognized: 1) the Asian northern sea otter (*E. l. lutris*), which occurs west of the Aleutian Islands; 2) the southern sea otter (*E. l. nereis*), which occurs off the coast of California and Oregon; and 3) the Alaska subspecies of northern sea otter (*E. l. kenyoni*), which occurs from the west end of the Aleutian Islands to the coast of the State of Washington (Wilson et al. 1991). Sea otters are carnivores that generally forage in nearshore marine and intertidal habitat less than 20 m deep (Bodkin et al. 2004). They eat a wide variety of benthic (living in or on the sea floor) invertebrates, including sea urchins, clams, mussels, crabs, and octopus. They are considered a keystone species that influences the species composition of their environment (Estes et al. 1978). Studies of subtidal communities in Alaska have demonstrated that when sea otters are abundant, herbivores such as sea urchins will be present at low densities whereas kelp, which is consumed by sea urchins, will flourish. Conversely, when sea otters are absent, grazing by sea urchin populations creates areas of low kelp, known as urchin barrens (Estes and Harrold 1988).

Population Dynamics

Population Distribution, Structure, and Variability

The Alaska subspecies of the northern sea otter ranges from southeast Alaska to the Aleutian Islands. Within the range of *E. l. kenyoni,* three stocks have been identified based on morphological and some genetic differences between the southwest and south-central Alaska stocks and physical barriers to movement across the upper and the lower portions of Cook Inlet (USFWS 2005) (Figure 1). The southwest DPS is the only stock listed under the ESA. It includes otters along the Alaska Peninsula and Bristol Bay coasts, and the Aleutian, Barren, Kodiak, and Pribilof islands.

Within the range of the southwest Alaska DPS, physical habitat features vary from steep rocky islands surrounded by deep water in the Aleutians, to extensive shallow waters with predominantly sandy substrates in Bristol Bay, to the mix of features found along the southern Alaska Peninsula and Kodiak Island. Along with geographic variation, there are differences in the ecological communities, especially in dominance of various species within the communities, and presumably also in ecosystem processes. These differences, along with the observed regional differences in patterns of sea otter population decline, support the designation of five management units (MUs) within the range of the DPS, as shown in Figure 2.

Population Size

Aleutian Islands – Prior to 1911, fur traders decimated Alaskan sea otters populations. Numbers gradually rebounded after the cessation of commercial hunting. The first large-scale population surveys of sea otters in the Aleutian Islands were conducted from 1957 to 1965 by Kenyon (1969). The total unadjusted count for the entire Aleutian archipelago during the 1965 survey was 9,700 sea otters. At the time, sea otters were believed to have reached equilibrium densities throughout roughly one-third of the Aleutian archipelago, ranging from Adak Island in the east to Buldir Island in the west (Estes 1990). Islands in the other two-thirds of the archipelago had few sea otters, and researchers expected additional population growth in the Aleutians to occur through range expansion. From the mid-1960s to the mid-1980s, otters expanded their range, and presumably their numbers as well, until they had recolonized all the major island groups in the Aleutians. Habitat-based modeling conducted for the late 1980's estimated around 74,000 individuals in the Aleutians population (Burn et al. 2003).

Population declines began in the early 1990's. A 1992 aerial survey of the entire Aleutian archipelago documented only 8,048 otters (Evans et al. 1997); approximately 19% less than the total reported for the 1965 survey. In April 2000, 2,442 sea otters were counted; a 70% decline from the count eight years previous (Doroff et al. 2003). Along the more than 5,000 km (3,107 miles) of shoreline surveyed, sea otter

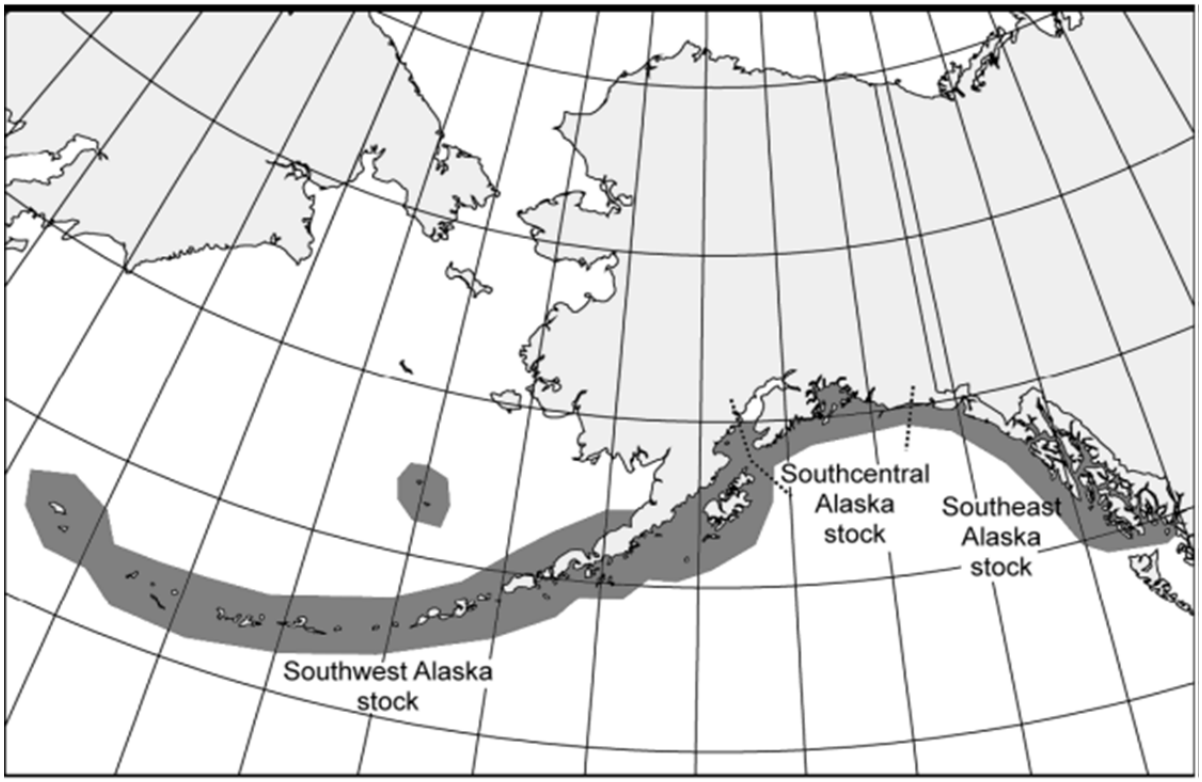

Figure 1. The geographic distribution of the three stocks of *E. l. kenyoni*.

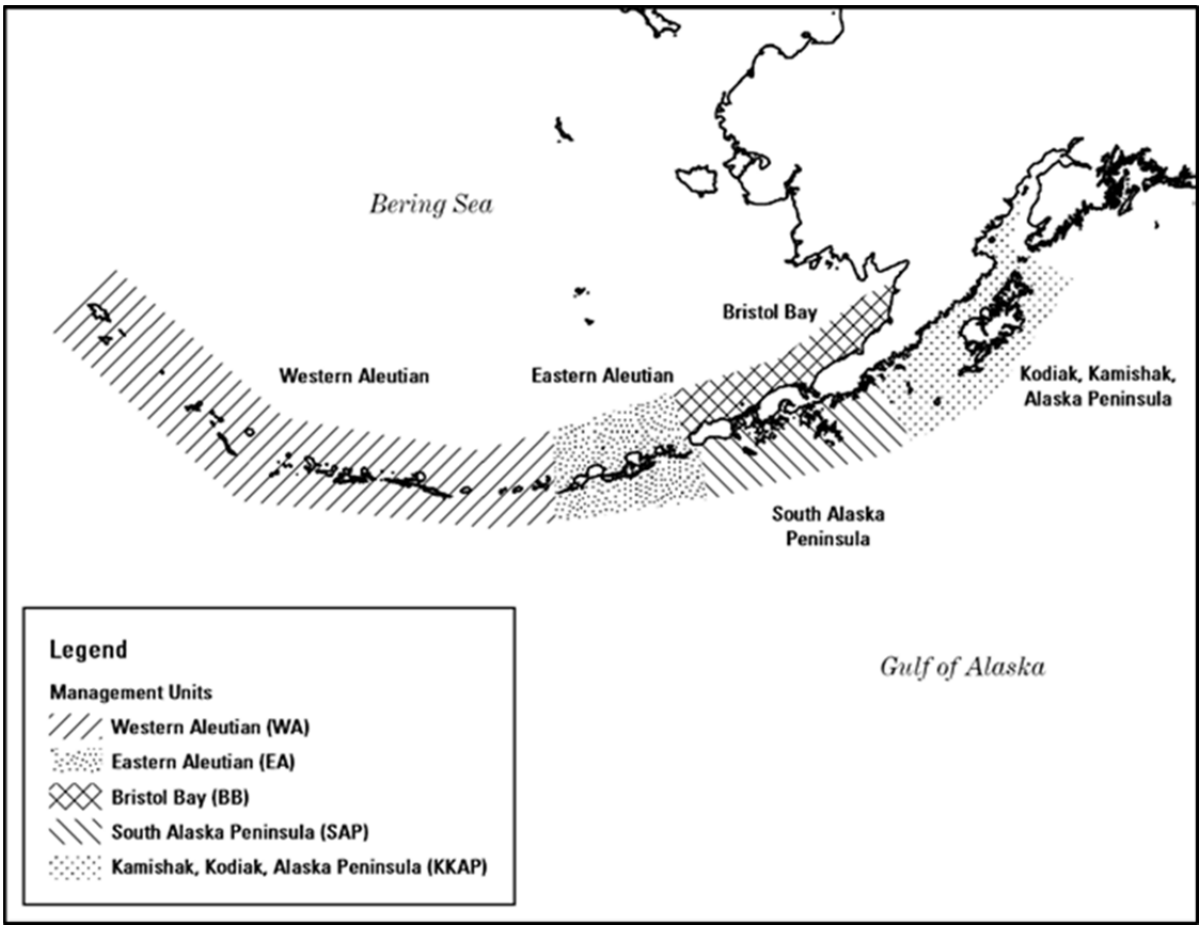

Figure 2. Management units for the southwest Alaska DPS of the northern sea otter. [Top]

density was at a uniformly low level, which clearly indicated that sea otter abundance had declined throughout the archipelago. Doroff et al. (2003) calculated that the decline occurred at an average rate of 17.5% per year in the Aleutians. Similar population declines were seen during skiff surveys conducted from 1993 to 2003. Population trends appear to have stabilized between 2003 and 2011, with an average growth rate of approximately zero. Localized population growth has been detected, but the overall trends do not provide evidence of recovery in the Aleutians (USGS & USFWS unpublished data).

Western Alaska Peninsula -- Remnant colonies were believed to have existed near the western end of the Alaska Peninsula after commercial fur harvests ended in 1911 (Kenyon 1969). During surveys in 1965, 2,892 sea otters were observed between Unimak Island and Amak Island on the north side of the Peninsula (Kenyon 1969). In 1976, Schneider (1976) estimated a total of 17,000 sea otters on the north side of the Alaska Peninsula (Burn and Doroff 2005), which he believed to have been within the carrying capacity for the area. In 1986, it was estimated that 6,474–9,215 sea otters occurred there (Burn and Doroff 2005). In May 2000, an estimated 4,728 sea otters were counted on the north side of the Alaska Peninsula; a 27% to 49% decline from 1986 (Burn and Doroff 2005).

Population declines were also apparent on the south side of the Alaska Peninsula. Pavlof , Shumagin, Sanak, Caton, and Deer islands were surveyed in 1962 (Kenyon 1969; 1,900 otters), in 1986, (Brueggeman et al. 1988; 2,122 otters), and in 1989 (DeGange et al. 1995; 1,589 otters). There were approximately 16–28% fewer sea otters in 1995 than were reported in the earlier counts. Surveys were conducted in these island groups in 2001, and only 405 individuals were counted (Burn and Doroff 2005); an 81% decline from the 1986 count (Brueggeman et al. 1988). Estimates of sea otters occupying offshore areas on the south side of the Alaska Peninsula, west of Castle Cape in 1986 (Brueggeman et al. 1988) were 13,900–17,500 (Burn and Doroff 2005). A replication of this 1986 survey route during April, 2001 suggested a 93% decline in abundance (Burn and Doroff 2005). In 1989, DeGange et al. (1995) counted 2,632 sea otters along the southern shoreline of the Alaska Peninsula between False Pass and Castle Cape. In a repeated survey of this route in 2001, 2,651 sea otters were counted (Burn and Doroff 2005), nearly the same as the 1989 count. The results from the different surveys indicate various rates of change, but overall, the combined counts for the Alaska Peninsula have declined by 65–72% since the mid-1980s. The estimated number of sea otters along the entire Alaska Peninsula was 19,821 as of 2001.

Eastern Alaska Peninsula: Castle Cape to Kamishak Bay and the Kodiak Archipelago -- No reductions in population levels have been observed along the southern coast of the Alaska Peninsula east of Castle Cape, in lower Cook Inlet, or in the Kodiak Archipelago in recent history (Bodkin et al. 2003, Burn and Doroff 2005). Conversely, these populations are stable and may be increasing (DeGange et al. 1995, Burn and Doroff 2005, Coletti et al. 2009, USGS & USFWS unpublished data). The equilibrium density of sea otters in this eastern region may be lower than in the central and western Aleutians (Burn and Doroff 2005, Bodkin et al. 2003). Although there remains uncertainty about the causes of decline elsewhere in the range, surveys suggest that threats in this area are different and perhaps less severe than those elsewhere.

Population-wide estimates -- Our current estimate of the size of the listed population of the sea otter, based on surveys in 2000-2008 and adjusted for animals not detected, is 53,674 (Table 1). Our best estimates are subject to reasonable uncertainty. Survey methods vary in different locations. Like survey efforts for most species, detection of all the individuals present is not always possible. Nevertheless, these demonstrate the best information available on the population size of the listed sea otter. As recent site-specific surveys indicate the decline has not abated in the Aleutian archipelago and south Alaska Peninsula areas, it is possible that the current population size is actually lower.

Recruitment and Population Growth

Estimating the rate of recruitment of sea otters is difficult. While generally, male sea otters reach sexual maturity at five to six years of age and females reach sexual maturity at three to four years, there is variation

in age of first reproduction (Garshelis et al. 1984, Von Biela et al. 2007). The interval between pups is typically one year, but the presence of pups and fetuses at different stages of development in all seasons suggests that reproduction occurs at all times of the year and is asynchronous within a population. Additionally, it is difficult to reliably distinguish males from females and juveniles from adults externally. For this long-lived species—the maximum life span of which is 23 years in the wild (Nowak 1999)—we expect that the recruitment rate is sensitive to environmental fluctuations and is related to maternal age and experience (Eberhardt 1977). High population growth rates are possible, but uncommon among the listed population. Estes (1990) and Bodkin et al. (1999) estimated growth rates as high as 17–20 % per year for sea otter populations expanding into unoccupied habitat. The southwest Alaska DPS of sea otter is currently distributed at low densities throughout most of its former range.

Table 1. Recent sea otter population estimates for sea otter management units (MUs) within the southwest Alaska DPS of the northern sea otter. Results from the Bristol Bay, South Alaska Peninsula, and portions of the Kodiak, Kamishak, and Alaska Peninsula MUs are adjusted using a correction factor of 2.38 following Evans et al. (1997). Counts from the Western Aleutian, Eastern Aleutian, and portions of the Kodiak, Kamishak, Alaska Peninsula MUs have been adjusted using survey-specific correction factors (USFWS 2013).

Management Unit	Time Period	Most Recent Adjusted Count or Estimate	Population Change	References
Western Aleutian	1992 - 2000	6,451	-73%	Doroff et al. (2003) Estes et al. (2005)
Eastern Aleutian	1992 - 2000	2,291	-56%	Doroff et al. (2003)
Bristol Bay	1986 - 2000	11,253	-39%	Burn and Doroff (2005)
South Alaska Peninsula	1986-2001	4,724	-74%	Burn and Doroff (2005)
Kodiak, Kamishak, Alaska Peninsula	1994 - 2008	28,955	Stable or growing	Burn and Doroff (2005) Bodkin et al. (2003) USGS (unpublished data)
Total		53,674	-43 to 58%	

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Status of the Species

Reasons for Listing and Threats

The southwest Alaska DPS of sea otter was listed as threatened in 2005 in response to observed population declines. Surveys indicate that declines have not abated in several areas within southwest Alaska, but population levels have stabilized in other areas. Recent population viability analyses indicate that if the Western and Eastern Aleutian Islands, Bristol Bay, and South Alaska Peninsula MUs continue to decline, a status listing up-grade from “threatened” to “endangered” will be warranted (USFWS 2013).

Predation -- The weight of evidence suggests that predation by killer whales may be the most likely cause of the sea otter decline in the Aleutian Islands (Estes et al. 1998). Evidence supporting this hypothesis includes: 1) an increase in the number of killer whale attacks on sea otters during the 1990s, (Hatfield et al. 1998); 2) the number of observed attacks fits expectations from computer models of killer whale energetics; 3) a scarcity of beach cast otter carcasses that would be expected if disease or starvation were occurring; 4) markedly lower mortality rates between sea otters in a sheltered lagoon (where killer whales cannot go) as compared to an adjacent exposed bay; 5) observed declines of harbor seals (*Phoca vitulina*) and Steller sea lions (*Eumetopias jubatus*), the preferred prey species of transient, marine mammal-eating killer whales, throughout the western North Pacific (Estes et al. 1998); and 6) evidence that the decline was driven by elevated sea otter mortality rates, not reduced fertility or redistribution (Laidre et al. 2006).

Subsistence Harvest -- Subsistence harvest by Alaska Natives is not likely to have had a major impact on the listed sea otter. Some of the largest observed sea otter declines have occurred in areas where subsistence

harvest is either nonexistent or extremely low. The majority of the subsistence harvest in southwest Alaska occurs in the Kodiak archipelago. Given the estimated population growth rate of 10% per year estimated for the Kodiak archipelago by Bodkin et al. (1999), we would expect that these harvest levels by themselves would not cause a population decline.

Interaction with Commercial Fisheries -- Fisheries for benthic invertebrates in southwest Alaska could compete with sea otters for prey resources. However, there is little overlap between the distribution of sea otters and fishing effort. In addition, the total commercial catch of prey species used by sea otters is relatively small (Funk 2003). Sea otters are sometimes taken incidentally in fishing operations, but information from the 2011 National Marine Fisheries Service List of Fisheries indicates that entanglement leading to injury or death occurs infrequently within the range of the listed sea otter (76 FR 73912, November 29, 2011).

Commercial over-utilization -- Following 170 years of commercial exploitation, sea otters were protected in 1911 under the International Fur Seal Treaty, which prohibited further hunting. Sea otters have rebounded from the estimated 1,000–2,000 individuals that were left after the cessation of commercial hunting (USFWS 2005). There is currently no commercial use of sea otters in the United States. Recreational, scientific, and educational use have been regulated under the MMPA.

Development -- Habitat destruction or modification is not known to be a major factor in the decline of the listed sea otter. Docks, harbors, and dredging projects may affect sea otter habitat on a local scale by disturbing the sea floor and affecting benthic invertebrates eaten by sea otters. As harbor and dredging projects typically impact an area of 50 hectares or less, the overall impact of these projects on sea otter habitat is considered to be negligible (USFWS 2008a). However, the cumulative effect of incremental, losses of critical habitat may gradually affect the population (see Table 2).

Table 2: Take of sea otters and loss of critical habitat accounted for under section 7 of the ESA from 2005 to present

Year	Action	Incidental Take Type	Amount
2007	Akutan Airport	Disturbance	36 sea otters over the life of the project
2007	Akutan Airport	Impacts to Critical Habitat	<1 acre
2008	Southwest DPS Sea Otter Research USGS	Disturbance/Lethal	250/ lethal take of one sea otter
2009	Southwest DPS - Research Permit Intraservice consultation	Precautionary	No direct take without prior authorization from USFWS. Unquantified incidental take through possible response to emergencies.
2009	Kodiak Island Port Lions Harbor Project	Impacts to Critical Habitat	<1 acre
2009	Unalaska Carl E Moses Boat Harbor road	Impacts to Critical Habitat	<1 acre
2009	Diamond Point Cottonwood Bay Iliamna Bay Granite Rock Quarry	Impacts to Critical Habitat	25 acres permanently lost
2009	Kodiak Airport Expansion	Impacts to Critical Habitat	20 acres lost due to creation of uplands
2010	Unalaska Small Boat Harbor Construction	Impacts to Critical Habitat	19.0 acres
2010	Unalaska Airport runway	Impacts to Critical Habitat	2.2 acres temporary loss and 1.6 acres filled
2010	King Cove Harbor	Impacts to Critical Habitat	<1 acre
2011	Kodiak Shakmanof Cove Rock Quarry	Impacts to Critical Habitat	2.64 acres critical habitat filled/dredged
2011	Homer to Williamsport to Levelock Fiberoptic Cable	Impacts to Critical Habitat	~7 acres, temporary impacts only
2011	Williamsport Dredging	Impacts to Critical Habitat	<1 acre
2011	Kodiak St. Herman Bay Upland creation	Impacts to Critical Habitat	<1 acre
2011	Old Harbor Airport Expansion	Impacts to Critical Habitat	2.5 acres of lost due to placement of fill
2011	Kodiak Woody Island FAA Boat Ramp	Impacts to Critical Habitat	0.12 acres lost due to placement of fill.
2012	Perryville Barge Ramp	Impacts to Critical Habitat	0.23 acres lost due to fill, 0.12 acres modified
2012	Akutan Trident Seafoods fill for Housing	Impacts to Critical Habitat	0.48 acres permanently lost due to fill
2012	Kodiak Port Lions City Dock and Ferry	Impacts to Critical Habitat	3.75 acres permanent loss due to fill
2013	False Pass Bering Pacific Seafoods Dock	Impacts to Critical Habitat	0.15 acres modified due to shading
2013	Kodiak Thelma C dock	Impacts to Critical Habitat	0.04 acres lost due to fill, 0.02 acres modified

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Research -- Scientific research on sea otters occurs primarily as annual aerial and skiff surveys. When they occur, they last for very short durations of time. Other research includes capture and handling of individuals. During the 1990s, 198 otters were captured and released as part of health monitoring and radio telemetry studies at Adak and Amchitka (T. Tinker, University of California at Santa Cruz, in litt. 2003). In the recent past, 98 sea otters from the southwest Alaska DPS were live-captured and released as part of a multi-agency health monitoring study (USFWS 2005, 2008b). Accidental capture-related deaths have been rare, with research activities carefully monitored by the DMA.

Disease -- Infectious disease can drive populations to low densities, thus predisposing them to extinction by other forces (DeCastro and Bolker 2005, Gerber et al. 2005). Diseases can also slow growth rates, lower fecundity, alter behavior, and lower social status (Lafferty et al. 2005). Parasitic infection was identified as a cause of increased mortality of sea otters at Amchitka Island in 1951 (Rausch 1953). Highly pathogenic infestations were apparently the result of sea otters foraging on fish, combined with a weakened body condition brought about by nutritional stress. More recently, sea otters have been impacted by parasitic infections resulting from the consumption of fish waste. Necropsies of carcasses recovered in Prince William Sound, revealed that some otters had developed parasitic infections and fish bone impactions that contributed to their deaths (Ballachey et al. 2002, King et al. 2000).

Valvular endocarditis (VE) and septicemia have recently been isolated as the cause of sea otter deaths in Alaska (Goldstein et al. 2009). The majority of these deaths are ultimately related to exposure to and infection from *Streptococcus* bacteria. The combination of VE, septicemia, and meningoencephalitis due to *Streptococcus* complex is now being referred to as “Strep bovis syndrome.” An “Unusual Mortality Event” linked to Strep bovis syndrome was declared in Alaska in September 2006 among the non-listed sea otter populations of Kachemak Bay and the adjacent Kenai Peninsula. Population surveys indicated that sea otter numbers in these areas were increasing during the time, suggesting the possibility that Strep bovis syndrome represents a density-dependent disease and not a decline-causing process. However, because the disease has been detected in some listed animals in Kodiak and the Alaska Peninsula, it is still of concern. While it is unlikely that Strep bovis syndrome was a factor in the decline of the southwest stock, it could be a factor limiting population recovery (USFWS 2013).

Oiling -- The effects of oil on sea otters include short-term acute oiling of fur, resulting in death from hypothermia, smothering, drowning, or ingestion of toxics during preening. Oil also affects sea otters over the long term; oil persisting in the habitat and taken up by prey continues to affect sea otters through the food web (Peterson et al. 2003). Unlike vertebrates, invertebrates do not metabolize hydrocarbons. They accumulate hydrocarbon burdens in their tissues (Short and Harris 1996). As such, sea otters may be exposed to residual oil through physical contact with oil or ingestion of contaminated prey. Long-term sublethal exposure can compromise health, reproduction, and survival across generations (Bodkin et al. 2002). Large spills such as the 1989 *Exxon-Valdez* oil spill in Prince William Sound are likely to have population-level impacts to the species, while smaller spills affect local areas and individuals.

Recovery

The goal of the sea otter recovery plan (USFWS 2013) is to establish a framework of recovery actions that will ensure the long-term survival of the DPS and control or reduce threats such that the species will no longer require the protections of the ESA. Full recovery of the southwest Alaska DPS is envisioned as cessation of further population declines and maintenance of viable numbers of otters throughout the current range of the listed sea otter to ensure the high probability of survival for at least 100 years.

Critical Habitat

In 2009, the Service designated 15,164 km^2 of critical habitat for the sea otter in southwest Alaska. The Primary Constituent Elements (PCEs) of critical habitat are the physical and biological features essential to the conservation of the species that may require special management considerations. The PCEs for sea otter

critical habitat are: 1) shallow, rocky areas less than 2 m in depth where marine predators are less likely to forage: or 2) nearshore waters within 100 m from the mean high tide line (MHT) that may provide protection or escape from marine predators; and 3) kelp forests, which occur in waters less than 20 m in depth, that provide protection from marine predators, or 4) prey resources within the areas identified by PCEs 1, 2, and 3 that are present in sufficient quantity and quality to support the energetic requirements of the species. [Top]

ENVIRONMENTAL BASELINE

This section summarizes the effects of past and present human and natural phenomena on the current status of listed sea otters and their habitat in the action area. The information presented in this section establishes the baseline condition for natural resources, human usage, and species usage in the action area that will be used as a point of comparison for evaluating the effects of the proposed action. Because the action area includes the entire distribution of the listed population of sea otters, the environmental baseline is as described under "**STATUS OF THE SPECIES**". Additional factors affecting sea otters within the action area include exposure to seafood processor waste, collisions with vessels, and climate change.

Seafood discharges -- Sea otters occur in areas where seafood processing has had major impacts to water quality including Akutan Harbor, Unalaska, Sand Point, and Chiniak and Chignik bays. The deposition of residues on the seafloor results in modification of the benthic community through smothering, creation of anoxic conditions due to high biochemical oxygen demand, changes in the microbial community, and a shift to a planktonic scavenger food web (Bluhm and Bechtel 2003). The direct impacts to sea otters are unknown, but degraded habitat conditions may increase the likelihood of contaminant or pathogen exposure. Additionally, seafood processing facilities are associated with fishing, barge traffic, fueling operations, vessel maintenance, and mooring. These associations increase the probability that petroleum hydrocarbons will be spilled into the marine environment near the seafood processing discharges (Day and Pritchard 2000), further increasing possible contaminant exposure.

Collisions -- Colliding with a vessel could kill a sea otter, however, boat strikes are unusual throughout much of the range of the listed sea otter; healthy sea otters are often vigilant and able to avoid collisions (V. Gill, 2013, USFWS, pers. comm.). USFWS (2013) concluded that because there is relatively little boat traffic in southwest Alaska, injury by boat strike is likely to be very rare.

Climate change -- The term "climate change" refers to a change in the mean or variability of one or more measures of climate (e.g., temperature or precipitation) that persists for an extended period, typically decades or longer, whether the change is due to natural variability, human activity, or both (IPCC 2007). Various types of changes in climate can have direct or indirect effects on species. These effects may be positive, neutral, or negative and they may change over time, depending on the species and other considerations, such as the effects of interactions of climate with other variables (e.g., habitat fragmentation) (IPCC 2007). In our analyses, we use our expert judgment to weigh relevant information, including uncertainty, in our consideration of various aspects of climate change.

Evidence is emerging that human-induced global climate change is linked to the warming of air and ocean temperatures and shifts in global and regional weather patterns including reduced sea ice cover. Reduced ice cover in the Arctic is likely to result in increased ocean acidification. Acidification may impact shellfish and other marine organisms that create their shells and other hard parts from calcium carbonate. Sea otters rely on these types of organisms for food. Within the range of the sea otter, short-term changes in the ocean climate are likely to continue on a scale similar to those presently occurring. It is not clear whether climate change or ocean acidification will affect sea otter recovery. [Top]

EFFECTS OF THE ACTION

This section includes an analysis of the direct and indirect effects of the action on listed species and critical habitat together with the effects of other activities that are interrelated or interdependent with the action. The reissuance of MMPA permit PRT067925 by the DMA for studies involving capture, blood and tissue sampling, external and/or subcutaneous tagging, and/or implantation of radio transmitters in sea otters will result in take of up to 70 animals per year for five years (total of 350 takes) during capture and release activities, and incidental lethal take of up to one animal per year.

Factors Considered and Type of Impacts

The effects of the proposed action are a function of: 1) temporal and spatial overlap with sea otters within the area affected; 2) the nature and duration of effects; and 3) the frequency, intensity, and severity of effects. All research will overlap with sea otters. Capture activities will occur only in spring, summer, and early fall. The nature and duration of effects will depend on type of activity to which individuals are exposed. Vessel activities associated with research will generate short duration, low intensity disturbance only. Captures will cause temporary high intensity, low severity effects related to stress and physical impacts of handling. Implantation of transmitters may have long-term, severe effects to individuals due to surgical risks. All activities will be low frequency; captures will be conducted once per animal.

Analysis of Effects and Species Response

Disturbance from Survey Vessels

Sea otters will be exposed to vessel traffic during research activities, and may exhibit behavioral or physiological responses indicative of disturbance. Signs of disturbance in response vessels may include: swimming away from approaching vessels; hauled-out otters entering the water; resting or feeding otters beginning to periscope or dive; and groups of otters scattering in different directions (Udevitz et al. 1995). These reactions consume energy and divert time and attention from biologically important behaviors such as feeding.

Some degree of disturbance will occur, but the frequency of disturbance and the intensity and severity of the responses are likely to be extremely low. Sea otters generally show a high degree of tolerance and habituation to vessel traffic (S. Speckman, 2012, USFWS, MMM, pers. obsv.). Populations of sea otters in southern Alaska have been shown to avoid areas with heavy boat traffic, but return during seasons with less traffic (Garshelis et al. 1984). Sea otters off the California Coast showed only mild interest in boats passing within hundreds of meters (Riedman 1983). Curland (1997) found that sea otters in California became habituated to boat traffic. Their behavior is suggestive of a dynamic response to disturbance, abandoning areas when disturbed persistently and returning when the disturbance stops. When this type of disturbance is infrequent, responses by otters do not differ substantially from normal reactions to perceived natural threats. Therefore, there will be no reduction in fitness associated with such reactions and no take, as defined under the ESA, will occur from vessel disturbance.

Capture, Handling, and Surgical Procedures

The possible effects of capture, handling, biological sampling, external or subcutaneous tagging, and surgical implantation of transmitters include direct or indirect impacts of stress and physical trauma. These impacts are expected to be short-term, lasting only the duration of the capture and handling period, plus time for recovery. To reduce the effects of capture and handing stress on sea otters, standardized protocols developed by sea otter experts at the ASC and approved by IACUC will be applied, along with the minimization measures described under “**Applicant-Proposed Impact Avoidance and Minimization Measures**.” When such protocols are applied, there is a low incidence of mortality. Most sea otters recover well and are unlikely to suffer any long term fitness consequences. With any wildlife handling protocol, there is the possibility of accidental injury and/or death of a limited number of individuals. In capture studies involving over 1,000 wild otters, injury and mortality rates were low, and capture myopathy was

non-existent (Williams et al. 1995). In previous ASC capture studies, only 1.6% of captures resulted in verified or suspected mortalities (Ballachey 2013). In approximately 500 surgical implantation/explantation surgeries over the last 14 years, there have been only five or six cases in which there was reason to believe that the procedures contributed to mortality, some of which were subsequently found (through post mortem exams/lab tests) to have pre-existing conditions that greatly elevated their risk (M. Murray, 2013, Monterey Bay Aquarium, pers. com. to M. Farris).

If approved, the MMPA permit will authorize take of up to 70 sea otters per year for five years (total of 350) and the incidental lethal take of one animal per year (total of five) during all capture and release activities. Unintentional lethal take is not likely, but is possible. If lethal take occurs, the circumstances will immediately be reported and protocols reviewed to ensure a second lethal take does not occur within the year.

Impacts to individuals from the proposed project are not likely to translate to population-level impacts. Within the range of the listed sea otter, areas selected for capture studies are likely to be those that have a relatively high abundance of sea otters. Effects will be temporary, and the proportion of sea otters that are harmed or harassed in the local population will be low. There will be multiple study areas, and study areas may differ between years. These measures will ensure that any single small, isolated, or localized sea otter population will not experience high levels of take, and that any affected population will have the capacity to withstand the anticipated level of take without a measureable effect on the population's mortality, reproduction, or recruitment rates. Any reductions in individual fitness are therefore not likely to reduce the performance (viability) of the populations those individuals represent. Because population-level effects are unlikely, the viability of the species will not be compromised. The project will have long-term beneficial impacts associated with recovery efforts arising from knowledge gained during the proposed research activities.

Impacts to Critical Habitat

This evaluation does not rely on the regulatory definition of "destruction or adverse modification of critical habitat" at 50 CFR 402.02. Instead, we have relied upon the statutory provisions of the ESA to complete this analysis with respect to critical habitat. The presence of researchers and vessels associated with the proposed project will cause disturbances within the critical habitat. These activities will have no effect on the PCEs of the habitat, nor any measureable effect upon other habitat characteristics.

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. 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. We anticipate that all existing threats to listed sea otters are reasonably certain to continue. Although the State of Alaska is in discussion about oil and gas exploration activities along the western shores of Cook Inlet and the northern shores of the Alaska Peninsula, we are uncertain at this time if such activities are reasonably certain to occur.

CONCLUSION

This BO assesses the direct and indirect effects of the reissuance of DMA research permit PRT067925 on the southwest Alaska DPS of sea otter given their current status, the environmental baseline for the action area, the cumulative effects, and the effects of the proposed action. **The Service has determined that this proposed activity is not likely to jeopardize the continued existence of this species, nor destroy or adversely modify designated critical habitat.** A conclusion of "jeopardy" for an action means that the action could reasonably be expected to reduce appreciably the likelihood of both the survival and recovery of the northern sea otter. A conclusion of "adverse modification" means that the action could reasonably be

expected to appreciably diminish the value of critical habitat for the survival and recovery of this species.
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INCIDENTAL TAKE STATEMENT

Section 9 of the ESA prohibits the take of listed species without special exemption. Taking is defined as harassing, harming, pursuing, hunting, shooting, wounding, killing, trapping, capturing, collecting, or attempting to engage in any such conduct. Harm is further defined to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavior patterns, including breeding, feeding, or sheltering. Pursuant to sections 7(b)(4) and 7(o)(2) of the Act, taking that is incidental to and not intended as part of a Federal agency action is not considered a prohibited taking, provided that such taking is in compliance with an incidental take statement issued in conjunction with a formal biological opinion.

Amount or Extent of Take

Over the five-year life of the proposed permit, we anticipate that capture and handling of the threatened southwest Alaska distinct population segment (DPS) of northern sea otters will result in non-lethal take of up to 350 sea otters and the incidental lethal take of up to five animals.

Effect of Take

In the accompanying biological opinion, the Service determined that **this level of take is not likely to jeopardize the continued existence of this species**, nor destroy or adversely modify designated critical habitat.

Reasonable and Prudent Measures

The Service believes the following reasonable and prudent measures are necessary and appropriate to minimize impacts of incidental take of listed sea otters:

1. The Service must monitor all activities conducted pursuant to this BO to guide the development and refinement of measures designed to avoid and reduce adverse effects on sea otters.

Terms and Conditions

In order to be exempt from the prohibitions of section 9 of the ESA, the following terms and conditions which implement the reasonable and prudent measures shall be applied. These terms and conditions are non-discretionary.

The following term and condition implements reasonable and prudent measure 1:

1) Substantial modifications to survey, capture, or handling protocols will be reviewed by DMA and the AFWFO prior to executing the activities.
2) A project report summarizing the research activities and indicating the level of take at the conclusion of the project shall be submitted to DMA and AFWFO.
3) If a sea otter dies during the proposed activities, the DMA and AFWFO shall immediately be contacted and the circumstances reviewed to ensure a second lethal take does not occur within the same year.

Reinitiation notice

This concludes formal consultation on the proposed action. Consultation on this action should be reinitiated if (1) the amount or extent of permitted take is exceeded during project implementation; (2) new information reveals effects of the action that may affect listed species or critical habitat in a matter or to an extent not considered in this biological opinion; (3) the action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this BO; 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, the exemption issued pursuant to section 7(o)(2) will have lapsed and any further take would be a violation of the ESA. Consequently, we recommend that any operations causing such take should cease pending reinitiation of consultation.

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