PETITION TO LIST THE ALEUTIAN POPULATION OF THE NORTHERN SEA OTTER (*ENHYDRA LUTRIS*) AS AN ENDANGERED SPECIES

CENTER FOR BIOLOGICAL DIVERSITY, PETITIONER

OCTOBER 25, 2000

NOTICE OF PETITION

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Petitioner Center for Biological Diversity formally requests that the Fish and Wildlife Service ("FWS") list the Aleutian population of the northern sea otter (*Enhydra lutris*) as an endangered species under the federal Endangered Species Act ("ESA"). If FWS does not find that the Aleutian population is a distinct population segment, the Center for Biological Diversity formally requests that *E. lutris* be listed as an endangered species throughout its range. The Center for Biological Diversity formally requests that critical habitat for the sea otter be designated concurrent with this listing.

The petition is filed under § 553(e) of the Administrative Procedure Act, § 1533(b)(3) of the ESA, and 50 C.F.R. § 424.14(b). FWS has jurisdiction over this petition. This petition sets in motion a specific administrative process as defined by 50 C.F.R. § 424.14(b), placing mandatory response requirements on FWS.

The Center for Biological Diversity is a non-profit environmental organization dedicated to the protection of native species and their habitats in the Western Hemisphere. The Center for Biological Diversity submits this petition on its own behalf and on behalf of its members and staff, with an interest in protecting the sea otter and the sea otter's habitat.

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EXECUTIVE SUMMARY

This petition seeks to designate the Aleutian population of the northern sea otter, *Enhydra lutris*, as an endangered species under the ESA. In the alternative, this petition seeks to list *E. lutris* as an endangered species throughout its range if FWS determines that the Aleutian population does not constitute a distinct population segment. In either case, this petition requests that critical habitat be designated for the sea otter concurrent with the listing of this species.

Once widely abundant throughout coastal areas, the sea otter was hunted to the brink of extinction by commercial hunters. However, after decades of protection, sea otter populations rebounded, and continued to climb through the 1980's. Unfortunately, this conservation success story has taken a turn for the worse: sea otter populations throughout Alaska have been declining rapidly since the mid-80's. No sea otter population has had as dramatic a decline as the Aleutian population. Once the largest population in the world, the population has declined by 95% over the past few years, with perhaps only 6,000 individuals remaining.

The Aleutian population is a distinct vertebrate population, and is thus a listable entity under the ESA. Because existing regulatory mechanisms to protect the species are inadequate, the population's habitat is being modified and destroyed, predation is eliminating the remaining population, and other factors are affecting the population's survival, the population should be listed as an endangered species under the ESA.

This petition reviews the taxonomy, biology, and natural history of the Aleutian population of the sea otter, the threats faced by the species, the factors FWS must consider in listing it as an endangered species, and recommends that critical habitat be concurrently designated with the listing of the species.

I. SYSTEMATICS

A. Taxonomy

The sea otter is the only marine mammal in the order Carnivora, and is the only member of the genus *Enhydra*. There is some debate about the taxonomic classification of sea otters on the species and subspecies level. Kenyon (1969) did not believe that there was enough difference between sea otter populations to categorize them as distinct subspecies. However, Kenyon did reserve his judgment by stating that additional research should be conducted before definitive conclusions about sea otter races were reached. Recent studies have indicated that there are significant genetic differences between several sea otter populations. (Wilson et al., 1991; Sanchez, 1992; Cronin et al., 1996). The FWS appears to have adopted the findings of these new reports, and has released documents indicating that there are three subspecies of sea otter: *E. lutris kenyoni* and *E. lutris lutris*, both commonly referred to as northern sea otters, and *E. lutris nereis*, commonly referred to as the southern sea otter. *E. lutris kenyoni* is found along the Aleutian Islands to Oregon, while *E. lutris lutris* is found in the Kuril Islands, Kamchatka Peninsula, and Commander Islands in Russia. *E. lutris nereis* is found in coastal waters along California. (Meehan, 2000).

Although the new studies provide compelling evidence for granting subspecies status to different sea otter populations, it may be too soon to rely upon the new subspecies distinctions. For the purposes of this petition, we will consider the sea otter to be one species, *E. lutris*, with several distinct populations. However, even if the subspecies designation is subsequently determined to be valid, the legal status of the Aleutian population relative to this petition would not change. Even in the more limited context of the subspecies *E. lutris kenyoni*, the Aleutian population's decline is so severe that listing the population as endangered is warranted.

FWS currently recognizes three stocks of *E. lutris* in Alaska, separated by distinct geographic and genetic differences. (Gorbics and Bodkin, in prep.). The Aleutian population extends from the western shore of Cook Inlet south and west to the Alaska-Russia border and includes the barren Islands, Kodiak Archipelago, Alaska Peninsula, Pribilof Islands and Aleutian Islands. (Gorbics et al., 1998).

Table 1. Taxonomic classification of the Aleutian population of the northern sea otter.

Kingdom	Phylum	Class	Order	Family	Genus	Species
Animalia	Chordata	Mammalia	Carnivora	Mustelidae	Enhydra	lutris

B. Species Description

The northern sea otter is the largest member of the family Mustelidae—which includes skunks, weasels, and badgers—but is the smallest of all marine mammals. It can weigh as much as 100 pounds and reach lengths of nearly 60 inches. It has a long, heavy body, making terrestrial travel clumsy and slow. It has long, soft fur with delicate, sparse guard hair. The claws of its forepaws are short and retractile, while its hind feet are flipper-like, webbed to the

tips of its toes. There is a loose flap or pouch of skin under each foreleg that extends partially across the chest. The tail is somewhat flattened and is usually shorter than one-third of the otter's body length. It has an external ear that resembles the ear of an eared seal more than it does the ear of its closest relative, the river otter. (Kenyon, 1969).

The sea otter is clumsy on land, and is seldom seen on shore. On the ocean surface, sea otters usually swim belly up, with forepaws on their chests and paddling with their hind feet. Under water, sea otters propel themselves through the ocean using an undulating swimming motion, not unlike other marine mammals. Sea otters sleep in kelp beds or in calm water while floating on their backs. The forepaws are used to groom the fur, to gather and grasp food, to break the shells of mollusks and crustaceans against a rock held against the chest, and to pass food to the mouth. The loose flap or pouch under each foreleg is used to hold food until the food is consumed. (Kenyon, 1969).

II. BIOLOGY AND ECOLOGY OF *E. LUTRIS*

A. Distribution and Habitat Requirements

Sea otters are the most specialized mustelid, adapted to a specific zone of the marine environment. They inhabit open coastal waters of the Pacific Ocean from California to the Aleutian Islands in the eastern Pacific and along the Kamchatka Peninsula and Kuril Islands in the western Pacific. They are seldom seen in waters deeper than 30 fathoms. Sea otters favor waters adjacent to rocky coasts near points of land, or large bays where kelp beds occur. They do not occupy inland waters far from sea, although they will enter bays on outer sea coasts. Sea otters do not migrate. (Kenyon, 1969).

B. Feeding Behavior

Sea otters require more food than most animals of comparable size. Although sea otters store body fat, they do not accumulate body fat as copiously as other marine mammals. Thus, in order to maintain homeostasis in their marine environment, sea otters rely heavily on the heat energy supplied by their rapid metabolism, and thus require a regular supply of food.

Sea otters gather food from the ocean floor, in waters ranging from a few feet to thirty feet deep. Feeding in deeper waters does not appear to occur. Sea otters use their forepaws and eyesight to collect benthic organisms, and then carry their prey to the surface. The type of food eaten by sea otters depends on the abundance of food in the area they occupy. Generally, sea otters eat benthic invertebrates and fish. Crabs, mollusks, shrimp, and sea urchins are common prey species. (Kenyon, 1969).

Sea otters rarely consume prey while under water. At the surface, sea otters use their forelegs to store and manipulate their prey. Food is kept in the skin folds underneath the forelegs until the otter is ready to consume it. The otter will then remove the prey from the folds and eat it. When consuming hard-shelled mollusks, sea otters will engage in a unique feeding behavior, pounding the shells against one another or against a rock in order to break them open and expose the meat. (Kenyon, 1969).

C. Reproduction

Sea otters appear to reach sexual maturity around age three, although a majority of the breeding otters appear to be in the 4-5 year age range. There appears to be no distinct breeding season, although the majority of the breeding seems to occur in the late fall to winter.

During the majority of the year, sea otters maintain sexual segregation, with females and males inhabiting discrete geographic areas. When ready to breed, males will search female areas for females in estrus. When the male sees a female during this search, he will swim to her directly and attempt to engage in reproduction. The female will either turn away her suitor by swimming away or snapping at him, or allow copulation to occur.

Once a receptive female is found, the courtship behavior will last up to an hour. A post-courtship period of a few days follows, in which the pair will groom and feed together. After a few days, the pair will separate.

The gestation period is between 6 and 8 months for sea otters. Once birth occurs, female sea otters may become pregnant again around 2 years later. The annual rate of reproduction is thought to be around 14-20%. (Kenyon, 1969).

III. POPULATION STATUS AND TRENDS

The worldwide distribution of sea otters before commercial exploitation is estimated to be between 150,000 and 300,000 individuals. (Kenyon, 1969; Johnson, 1982). Extensive commercial hunting of sea otters began following the arrival in Alaska of Russian explorers in 1741, and continued during the 18^{th} and 19^{th} centuries. By the time sea otters were afforded protection from commercial harvests by international treaty in 1911, the species was nearly extinct throughout its range, and may have numbered only 1,000 to 2,000 individuals. (Kenyon, 1969).

The remaining sea otters were distributed as 13 isolated remnant populations scattered throughout the historic range. Once commercial harvests ceased, these populations began to grow and recolonize their former range. In the Aleutian Islands, two remnant populations existed; one in the Rat Islands and the other in the Delarof Islands. The period of recolonization was marked by high reproductive rates and range expansion. Survey data indicate that by the 1980s, the Aleutian population was the largest sea otter population in the world, with sea otters present in every island groups in the Aleutians. (Brueggeman et al., 1988).

However, a survey of the entire Aleutian archipelago conducted in 1992 indicated that the sea otter population was again threatened with extinction. (Evans et al., 1997). The survey showed that sea otter density and abundance in the Rat, Delarof, and western Andreanof Islands had unexpectedly declined by more than 50%. Boat-based surveys of sea otters at several islands in the Near, Rat, and Andreanof Islands further documented an ongoing decline of sea otters during the 1990's, resulting in nearly an order-of-magnitude overall reduction in population by 1997. (Estes et al., 1998).

These surveys concerned biologists because they showed far fewer sea otters in the Aleutians than expected. These declines were not to be the last recorded by scientists in the area. During the 1990's, severe local declines in sea otter abundance were documented in portions of the central Aleutians by the United States Geological Survey. The areas most severely affected by these declines are those islands located in the central Aleutians.

In April, 2000, FWS's Marine Mammals Management Office replicated the 1992 aerial survey in the Aleutians. These surveys showed that the sea otter decline was continuing. Overall, the survey showed that sea otters in the Aleutian Islands have declined by 70% during the 8-year period from 1992 to 2000 (FWS, unpublished data). The largest declines occurred in the Rat Islands (-87%) and the central Aleutians (-71%). As few as 6,000 sea otters may remain in the Aleutians today. (Anonymous, 2000). This corresponds with a 95% decrease in sea otter population since the highs of the 1970's in the Aleutians.

IV. THE ALEUTIAN POPULATION IS A SPECIES UNDER THE ESA

The Aleutian population of sea otters is a geographically isolated and genetically differentiated vertebrate population facing imminent extinction. As such, it is a "species" under the ESA and qualifies for all the protections afforded by the ESA.

The ESA provides for the listing of all species warranting the protections afforded by the Act. The term "species" is defined broadly under the act to include "any subspecies of fish or wildlife or plants and any distinct population segment of any species of vertebrate fish or wildlife which interbreeds when mature." 16 U.S.C. § 1532 (16).

A. Distinct Population Segment

The National Marine Fisheries Service ("NMFS") and the FWS have published a policy to define a "distinct population segment" for the purposes of listing, delisting, and reclassifying species under the ESA. 61 Fed. Reg. 4722 (February 7, 1996). Under this policy, a population must be found to be both "discrete" and "significant" before its can be considered for listing under the Act.

1. Discreteness

Under the joint NMFS/FWS policy, a population segment of a vertebrate species is considered discrete if it satisfies either one of the following conditions:

> 1. It is markedly separated from other populations of the same taxon as a consequence of physical, physiological, ecological, or behavioral factors.
>
> 2. It is delimited by international governmental boundaries within which differences in control of exploitation, management of habitat, conservation status, or regulatory mechanisms exist that are significant in light of section 4 of the ESA.

61 Fed. Reg. 4722.

The Aleutian population of sea otters meets the first criteria for "discreteness."

Evidence indicates that the Aleutian population is both genetically and geographically isolated from other populations of sea otters (Gorbics and Bodkin, in prep.). The inability of sea otters to feed in deep waters, and the lack of sightings of sea otters in waters deeper than 30 fathoms, indicate that the geographic barriers between populations are insurmountable. The FWS has indicated as much in several publications, including the 1998 Draft Stock Assessment for the Sea Otter. Because sea otters are not migratory, individuals from the population will not travel across deep seas and therefore the populations will remain discrete.

2. Significance

According to the listing policy, once a population is established as discrete, its biological and ecological significance should then be considered. This consideration may include, but is not limited to, the following:

> 1. Persistence of the discrete population segment in an ecological setting unusual or unique to this taxon.
>
> 2. Evidence that loss of the discrete population would result in a significant gap in the range of a taxon.
>
> 3. Evidence that the discrete population segment represents the only surviving natural occurrence of a taxon that may be more abundant elsewhere as an introduced population outside its historical range.
>
> 4. Evidence that the discrete population segment differs markedly from other populations.

61 Fed. Reg. 4722. The Aleutian population of sea otters meets three of these criteria for "significance": (1) It is a discrete population in a unique ecological setting; (2) loss of Aleutian sea otters would result in a significant gap in the range of sea otters; and (3) Aleutian population of sea otters differ markedly from other populations of sea otters.

a. Aleutian population sea otters are a discrete population in a unique ecological setting

In the 1980's, the Aleutian population contained the highest population of sea otters in the world, and was thus the population most able to rebound from extensive commercial hunting. This indicates that the population has ecological significance in that it has exhibited a greater ability to rebound from harm compared to other populations.

b. Loss of Aleutian population sea otters would result in a significant gap in the range of sea otters

A loss of the Aleutian population of sea otters population would create a significant gap in the range of the taxon as it would eliminate a significant portion of sea otters in Alaska. As discussed above, it would eliminate sea otters from a distinct separate ecosystem, in a distinct part of their range. The loss of this stock of animals would represent a significant gap in the range of the taxon.

c. The Aleutian population of sea otters differ markedly from other populations of sea otters

There is a distinct genetic difference between the Aleutian population of sea otters and that of other sea otter stocks. (Gorbics and Bodkin, in prep.)

V. THE ALEUTIAN POPULATION OF SEA OTTERS COMPRISE A "STOCK" UNDER THE MMPA

The Aleutian population of sea otter is classified as a "stock" under the Marine Mammal Protection Act (MMPA). While the analysis of whether a given marine mammal population is a separate "stock" differs somewhat from that of the NMFS/FWS listing policy, the finding that a population is a separate stock greatly supports a finding that the population is a listable entity under the ESA. The phylogeographic approach of Dizon et al. (1992) is used in classifying stocks. This approach involves a four part analysis of (1) distributional data, (2) population response data, (3) phenotypic data, and (4) genotypic data.

The Aleutian population of sea otters satisfies three of the criteria needed to be considered a stock. First, the Aleutian population utilizes distinctly separate summer and winter areas from those of other populations. The population meets the second criteria also, as the documented decline of the Aleutian population is occurring independently from that of other populations. Re-population of Aleutian population of sea otters is unlikely. The fourth criteria is satisfied by the genetic differences documented in sea otter populations. (Gorbics and Bodkin, in prep.)

In sum, the Aleutian population is a distinct vertebrate population segment of the species. It is eligible for consideration for listing under the ESA as it is both "discrete" and "significant." As described below, its current status mandates that it be listed as endangered under the ESA.

VI. *E. LUTRIS* IS AT RISK OF EXTINCTION THROUGHOUT A SIGNIFICANT PORTION OF ITS RANGE

If FWS does not determine that the Aleutian population is a listable population under the ESA, then it must conclude that the entire species of *E. lutris* must be listed as endangered. The Aleutian population once comprised over 90% of the world's sea otters. The recent decline of that population by 95% indicates that a significant portion of the sea otters range faces extinction. Thus, the FWS must list the species if it finds that the Aleutian population is not listable.

VII. LISTING FACTORS

Section 4(a)(1) of the ESA and regulations at 50 CFR part 424 set forth general listing criteria. If a species' existence is imperiled by one or more of the following five factors, it must be listed as "threatened" or "endangered."

A. Present or Threatened Destruction, Modification, or Curtailment of Habitat or Range

Both natural fluctuations and human activities have caused environmental changes in the Bering Sea. Climate variability occurs at several scales; the El Nino Southern Oscillation, which is a seasonal event; the Pacific Decadal Oscillation, often referred to as a regime shift; and global climate change, which is characterized by long term, progressive change. Interaction between these factors is significant and appears to affect many ecosystem components. Human-induced change is also significant, largely related to resource exploitation of both marine mammals and fish. As a result, the Bering Sea fish assemblage probably became pollock-dominated in the late 1960's and early 1970's, which may be responsible for decreased abundances of forage fish. Concurrent with these basic changes in ecosystem components are changes in seabird and marine abundances, which likely reflect changes to their primary food resources.

Tissue concentrations of total PCBs and DDT in sea otter liver samples from the Aleutian Islands (primarily from Adak and Shemya) were significantly higher than those of otters from Southeastern Alaska, and total PCB values were higher than those found in California otters. (Estes et al., 1997). Although the toxicity of PCBs in sea otters is unknown, the concentrations in liver of Aleutian otters were similar to or higher than those causing reproductive failure in captive mink. (Estes et al., 1997). Potential sources of these organochlorine compounds include local sources on specific islands and remote sources outside of Alaska. Initial population survey data suggest that reproduction in sea otters is not being suppressed in the Adak Island population. (Tinker and Estes, 1996). Since PCBs are normally thought to inhibit reproduction rater than increase adult mortality, these findings do not suggest a reproductive impact due to contaminants, however samples sizes were limited. Data needed to fully evaluate the potential role of environmental contaminants in the observed Aleutian sea otter decline are incomplete and a conclusive link to specific pollutants has not been established.

B. Overutilization for Commercial, Recreational, Scientific, or Educational Purposes

Sea otters are harvested by Alaska Natives for subsistence purposes. The majority of the harvest occurs in southeast and southcentral Alaska. Subsistence harvest does not appear to be a contributing factor in the ongoing decline in the Aleutians. Scientific research on sea otters in the Aleutians occurs primarily as aerial and skiff surveys of abundance. A limited number of otters have been live-captured for health monitoring and radio telemetry studies. The impact of these captures on the sea otter population is not significant.

C. Disease or Predation

The causes of the sea otter decline have been explored by reviewing available data on sea otter reproduction, survival, distribution, habitat, and environmental contaminants. Estes et al. (1998) concluded that the observed sea otter declines were most likely caused by increased adult mortality. While disease, pollution, and starvation may all influence sea otter mortality, there is no evidence at this time to suggest these factors are contributing to the decline. Several lines of

evidence, including a recent increase of observed interactions between killer whales (*Orcinus orca*) and sea otters indicates predation may be one of the leading causes of the sea otter decline in the Aleutian Islands (Hatfield et al., 1998).

Thy hypothesis that killer whale (*Orcinus Orca*) predation is causing the sea otter decline suggests a mechanism which extends further throughout the Bering Sea ecosystem. Preferred prey species of killer whales are Steller sea lions (*Eumetopias jubatus*) and harbor seals (*Phoca vitulina*). Both species have been in decline throughout the western north Pacific, which may have prompted killer whales to begin preying on sea otters. While the cause of sea lion and harbor seal declines is the subject of much debate, it is likely that changes in composition and abundance of forage fish as a result of climatic changes and commercial fishing practices are major factors.

Three lines of evidence point to increased predation by killer whales as the reason for recent sea otter declines. First, although killer whales and sea otters have been observed in close proximity for decades, the first attack on a sea otter was not seen until 1991. Subsequently, nine more attacks have been reported. The probability of these sightings to be skewed toward recent sightings due to random chance or varied searching effort was calculated as .006 by Estes et al. (1998). Thus, the killer whale predation hypothesis cannot be dismissed on the basis of differing search techniques or be attributed to random chance.

Second, the rate of mortality of sea otters in areas inaccessible to killer whales is far below the mortality rate for sea otters in areas accessible to killer whales. For example, studies of Clam Lagoon, an area uniquely inaccessible to killer whales, and adjacent Kuluk Bay, an open coastal environment, show that inaccessible Clam Lagoon had stable populations in the 1990's while Kuluk Bay populations declined by 76%. (Estes, 1998). These changes in population were controlled for migration; almost no migration between the two study areas has been observed.

Finally, the total amount of killer whale predation necessary to bring about the magnitude of sea otter decline currently observed is proportional to the number of killer whale attacks on sea otters that have been observed. That is, the number of expected attacks on sea otters based on the number of observed attacks is correlated with the total amount of killer whale predation that would be necessary to drive the current sea otter population dive.

D. The Inadequacy of Existing Regulatory Mechanisms

There are currently no regulatory mechanisms which adequately address the problems faced by this sea otter population. The Marine Mammal Protection Act of 1972 (MMPA) established a moratorium on the taking of marine mammals, which includes sea otters. Alaska Natives are exempt from this moratorium and may take marine mammals for subsistence purposes. The MMPA does not allow management prior to a finding of depletion. However, the threats to the species, including pollution and predation by other marine mammals, are not regulated by the MMPA.

E. Other Natural or Manmade Factors Affecting its Continued Existence

Activities associated with the exploration, development, and transportation of oil and gas have the potential for adversely impacting sea otter habitat in the Aleutians. The Exxon Valdez oil spill in March 1989 illustrates the impact that oil spills can have on sea otters. In Prince William Sound, estimated mortality due to the oil spill is approximately 750 sea otters to 2,650 sea otters. (Garshelis, 1997; Garrot et al., 1993). Spill-wide, 3,905 sea otters may have died in Alaska as a result of the spill. (DeGange et al., 1994). Ongoing research on the post-spill recovery of sea otters has found that densities of sea otters are up to an order of magnitude lower in areas of Prince William Sound where oiling was most severe and persistent, and where acute sea otter mortality was high, suggesting that complete recovery has still not occurred.

VIII. PROCESSING OF THIS PETITION

This petition is submitted under the provisions of the ESA, 16 U.S.C. §§1531 et seq., 50 C.F.R. 424.14, and the APA, 5 U.S.C. §533. As a petition to list a species as endangered, FWS is bound to process this petition within a predetermined time frame as defined by CFR 424.14(b) to the maximum extent practicable. The regulations require FWS to make a finding within 90 days of receipt of this petition as to whether a finding of 'endangered' may be warranted. The finding shall be promptly published in the Federal Register. 50 CFR 424.14(b)(1). Within 12 months of receiving this petition, FWS is required to find that this petition is not warranted, is warranted, or warranted but precluded, and shall promptly publish notice of such intention in the Federal Register. 50 CFR 424.14(b)(3). The Center for Biological Diversity fully expects FWS to comply with these mandatory deadlines.

SIGNATURE PAGE

This PETITION TO LIST THE ALEUTIAN POPULATION OF SEA OTTERS AS AN ENDANGERED SPECIES UNDER THE ENDANGERED SPECIES ACT is hereby submitted to the Secretary of Interior.

Respectfully submitted this 25th day of October 2000.

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