

SEA OTTER (*Enhydra lutris kenyoni*)
WASHINGTON STOCK
 U.S. Fish and Wildlife Service
 Lacey, Washington

STOCK DEFINITION AND GEOGRAPHIC RANGE

The northern sea otter, *Enhydra lutris kenyoni*, historically ranged throughout the North Pacific, from Asia along the Aleutian Islands, originally as far north as the Pribilof Islands and in the eastern Pacific Ocean from the Alaska Peninsula south along the coast to Oregon (Wilson et al. 1991). In Washington, areas of sea otter concentration were reported from the Columbia River to along the Olympic Peninsula coast (Scheffer 1940). Sea otters were extirpated from most of their range during the 1700s and 1800s as the species was exploited for its fur. Washington's sea otter population was extirpated by the early 1900s. In 1969 and 1970, a total of 59 sea otters were captured at Amchitka Island, Alaska, and released near Point Grenville and LaPush off Washington's Olympic Peninsula coast (Jameson et al. 1982; Jameson et al. 1986). Washington's current sea otter population originated from the Amchitka Island genotype (*Enhydra lutris kenyoni*).

For management purposes pursuant to the Marine Mammal Protection Act (MMPA), the range of the Washington sea otter stock is within the marine waters of Washington State. However, if the stock expands southward into Oregon or northward into British Columbia, a revised stock assessment would consider this expanded range.

In 2006, the distribution of the majority of the Washington sea otter stock ranged from Pillar Point in the Strait of Juan de Fuca, west to Cape Flattery and as far south as Cape Elizabeth on the outer Olympic Peninsula coast (Figure 1). However, scattered individuals (usually one or two individuals at a time) have been seen outside of this range. For example, sick or injured sea otters have come ashore as far south as Ocean Shores and repeated sightings have been reported in Grays Harbor and as far east as Port Townsend. Sightings around the San Juan Islands, near Deception Pass, off Dumas Bay, off the Nisqually River, and in southern Puget Sound near Squaxin and Hartstene Islands have also been reported. Several of the sea otters in Puget Sound became relatively "tame," and in some cases local residents were feeding these individuals and promoting their "friendly" behavior. The U. S. Fish and Wildlife Service (USFWS) and Washington Department of Fish and Wildlife (WDFW) intervened, to the extent necessary, when these individual sea otters exhibited behaviors that presented a danger to themselves or to human health and safety.



Figure 1. Approximate distribution of Washington sea otter stock.

In waters to the north of the Washington stock is the British Columbia sea otter population, which originated from animals also translocated from Amchitka Island and additional individuals from Prince William Sound, Alaska (Watson 2000). British Columbia's sea otter population, which is also increasing, includes at least 3,180 animals distributed mainly along the west coast of Vancouver Island from Barkley Sound to Cape Scott with a separate population along the mainland coast near Goose Island in Queen Charlotte Sound (COSEWIC 2007). Although most of the British Columbia sea otter population remains north of Estevan Point along the west coast of Vancouver Island, groups of 100 to 150 animals have recently been observed south of Estevan Point near Hesquiat Harbor and Flores Island just north of Tofino. Small numbers of animals have also been reported in Barkley Sound and scattered along the coast of the Strait of Juan de Fuca to Victoria. Currently there is no evidence of interchange between the Washington and British Columbia sea otter populations. However, as the Washington and British Columbia populations grow and expand their respective ranges, movement between these populations can be expected.

Sea otters breed and give birth year-round (Riedman and Estes 1990). Pupping period for Washington's sea otter stock is not well defined, with dependent pups observed in all months. However, births in Washington sea otters are believed to occur primarily from March to April, with peak numbers of dependent pups expected to be present from May to September (Ron Jameson, pers. comm.).

POPULATION SIZE

Original Washington Translocation

Fifty-nine sea otters were released off the Washington coast in 1969 and 1970, although almost half of the otters released in 1969 died. Sightings of sea otters were sporadic for several years after the translocations and during surveys through 1976, no more than 10 otters were observed at a time (Jameson et al. 1982). The current Washington sea otter population descended from no more than 43 otters and possibly as few as 10 (Jameson et al. 1982). Reproduction was first documented in 1974 (Jameson et al. 1982) and pups have been observed in all subsequent surveys.

Minimum Population Estimate

The first comprehensive post-release surveys of Washington's sea otter population were conducted by boat in 1977 and again in 1981 (Jameson et al. 1986). Boat, ground, and aerial surveys for sea otters were conducted biennially from 1981 to 1989. Starting in 1989 and continuing to present, Washington's sea otter population estimate has been developed from a combined aerial and ground survey conducted in early July by United States Geological Survey and/or WDFW. Based on the 2006 survey (actual count), the minimum population estimate of the Washington sea otter population is 790 individuals (Jameson and Jeffries 2006). No correction factor for missed animals has been applied to count data to determine a total population estimate from survey counts for Washington.

Current Population Trend

Based on count totals from 1977 to 1989, the Washington sea otter population increased at an annual rate of 20 percent (Jameson and Jeffries 1999). As has been done for the southern sea otter (*Enhydra lutris nereis*), three-year running averages are used to characterize population trends to dampen the effects of anomalous counts in any given year (U.S. Fish and Wildlife Service 2003). Jameson and Jeffries (2006) indicate “the finite rate of increase for this population since 1989 is 8 percent.” Survey data indicate the Washington stock is nearing equilibrium density north of La Push, where the rate of increase has shown no growth since 2000 (Jameson and Jeffries 2006). South of La Push, the stock has been growing at about 20 percent per year since 1989 (Jameson and Jeffries 2006).

Laidre et al. (2002) provides a carrying capacity (K) estimate of 1,019 sea otters (95 percent CI 754-1,284) for Washington’s sea otter stock to reoccupy rocky habitat from Destruction Island to Neah Bay (e.g., Seal and Sail Rocks). Laidre et al. (2002) also provide a total carrying capacity estimate for Washington of 1,836 sea otters (95 percent CI 1,386-2,286) based on an assumption that sea otters will reoccupy most of their historic habitat along the outer Washington coast (excluding reoccupation of the Columbia River, Willapa Bay, and Grays Harbor estuaries due to significant human alterations and use) and eastward into the Strait of Juan de Fuca as far as Protection Island. The Washington sea otter stock appears to be approaching equilibrium in the rocky habitat along the Olympic Peninsula coast; the reasons why the population has not dispersed into the unoccupied portions of its historic range are unclear.

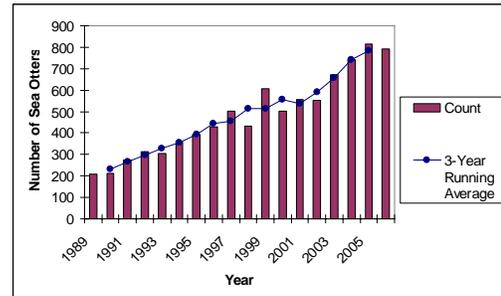


Figure 2. Three-year running average of population estimates (1989-2006).

CURRENT AND MAXIMUM NET PRODUCTIVITY RATES

The maximum annual growth rate (R_{\max}) for sea otter populations for which data are available has been reported as 17 to 20 percent (Estes 1990). From 1977 to 1989, the Washington stock grew at 20 percent (Jameson and Jeffries 1999) and appears to still be growing at this rate south of La Push (Jameson and Jeffries 2006). However, between 1989 and 2006, the growth rate of the entire Washington sea otter stock has slowed to an annual rate of 8 percent (Jameson and Jeffries 2006).

POTENTIAL BIOLOGICAL REMOVAL

The Potential Biological Removal (PBR) is the product of three elements: the minimum population estimate (N_{\min}); half the maximum net productivity rate ($0.5 R_{\max}$); and a recovery factor (F_r). For the Washington sea otter stock, $N_{\min}=790$; R_{\max} uses a maximum sea otter growth rate of 20 percent; and $F_r=0.1$. A F_r of 0.1 was used for the Washington sea otter stock because even though the population is increasing, the minimum population size is less than 1,500; N_{\min} is below 60 percent of K (DeMaster et al. 1996) for the historic range (excluding the Columbia River, Willapa Bay, and Grays Harbor estuaries); and the population is restricted in its

geographical range making it vulnerable to natural or human-caused catastrophe (Taylor et al. 2002). Therefore, the calculated PBR for the Washington sea otter stock is 8 animals.

ANNUAL HUMAN-CAUSED MORTALITY AND SERIOUS INJURY

Fisheries Information

Sea otters are susceptible to drowning in gillnets and have been taken in the Makah Northern Washington Marine Set-gillnet Fishery (Gearin et al. 1996). Based on observer data collected from 1988 through 2001, a total of 11 sea otters were taken when fishing effort occurred (Makah Tribe/Makah Tribal Resources and National Marine Fisheries Service (NMFS)/National Marine Mammal Lab (NMML) observer data). Although the fishing effort in this fishery began declining in the mid 1990s, sea otters continue to be taken in this fishery (Table 1). Pre-2000 data indicates sea otter mortalities are likely to occur when there is fishing effort in Areas 4 and 4A. Only mortalities, not serious injuries, are reflected in Table 1 because the nets set by the Makah fishery do not rise to the surface of the water and any otters that get caught in the nets will likely drown. Due to inconsistent reporting between fishing areas, years, and the associated fishing effort, observer coverage, and otter mortalities (see Table 1), a reliable estimation of the annual sea otter mortality and serious injury in the Makah Northern Washington Marine Set Gillnet Fishery is assumed to be a minimum of 2 when there is fishing effort. In order to provide a more accurate estimate of the annual mortality and serious injury associated with this fishery, the USFWS requested information from the NMFS and the Makah Tribe. The information provided by the NMFS and the Makah Tribe is not sufficient to provide a more accurate estimate.

Table 1. Summary of sea otter incidental mortality in Northern Washington Marine Set-Gillnet Fishery. (Source: NMFS/NMML observer program, BIA, and Makah Tribe)

Fishery Name	Year	Fishing Effort (Yes/No)	Observer Coverage	Observed/Reported mortality (Number of Otters)
Northern WA Marine Set Gillnet Areas 4/4A/4B/5	2003	Yes	None	-
	2004	Yes	1-11 net days observed*	2
	2005	Yes	None	-
	2006	Yes	None	-
	2007	Yes	None	-

*Observer coverage is presented in format supplied to USFWS

Other fisheries that occur within the range of the sea otter in Washington include treaty and non-treaty gillnet fisheries in the Strait of Juan de Fuca, Puget Sound, and Grays Harbor. There has not been marine mammal observer coverage of these fisheries since 1994, rather, incidental takings of marine mammals in these fisheries are reported to NMFS through self-reporting. (Sources: Treaty/Non-treaty sum of landings submitted to the USFWS as part of Biological Opinion reporting requirements, USDC NMFS 2003). The USFWS has not received any voluntary or observer reports of sea otters killed or seriously injured in these fisheries. Because the lack of information cannot be interpreted to mean that no sea otters have been killed

or seriously injured and in order to provide an estimate of the annual mortality and serious injury associated with these fisheries the USFWS requested further information from the NMFS. However, the information provided by the NMFS is not sufficient to provide a more accurate estimate of the annual mortality and serious injury associated with these fisheries. Sea otter densities along the Strait of Juan de Fuca in the summer and fall are low, when the fisheries generally operate, so few entanglements would be expected. However, as the Washington sea otter population continues to grow, the possibility of fisheries-related incidental take in these gillnet fisheries will grow.

Other fisheries that also occur within the range of the Washington sea otter stock include: 1) treaty set-gillnet fisheries that occur in the coastal rivers (Quinault, Queets, Hoh, Quillayute, Hoko, and Waatch); 2) treaty and non-treaty groundfish trawl fisheries that occur offshore of the Olympic Peninsula coast; and 3) treaty and non-treaty drift gillnet fisheries that occur in Willapa Bay. These fisheries are unlikely to result in mortality or serious injury because sea otters are unlikely to occur in these areas.

As sea otters expand their range eastward into the Strait of Juan de Fuca or south along the outer Washington coast, they will also encounter important sport and commercial shellfish fisheries (urchins, razor clams, Dungeness crabs, steamer clams, geoducks). “Evidence from California and Alaska suggests that the potential for incidental take of sea otters in crab traps will increase as the population expands its range south of Destruction Island into prime Dungeness crab habitat” (Lance et al. 2004). In addition, the potential exists for increased interactions with invertebrate fisheries, particularly sea urchins and geoducks, as the sea otter population expands eastward into the Strait of Juan de Fuca (Gerber and VanBlaricom 1999).

Other Human-Caused Mortality and Serious Injury

Other sources of human-caused mortality and serious injury affecting the Washington sea otter population are not well documented. Documented sources of human-caused mortality for the southern sea otter include shooting, boat strikes, capture and relocation efforts, oil spills, and possibly elevated levels of polychlorinated biphenyls and other toxic contaminants. In 2003, one Washington sea otter death was presumed to have been caused by a boat strike because of the type of injuries observed during necropsy. However, these injuries could also have been sustained in a variety of other ways.

In the past decade, a number of oil spills have occurred within the range of Washington’s sea otter population, with one documented oil related death recorded during one of these spills (Jameson 1996). Additionally, with the increasing volume of shipping traffic into and out of the Strait of Juan de Fuca, the potential for a catastrophic spill exists and most, if not all, of the Washington sea otter population and range is vulnerable to the effects of such a spill. Significant oil-related mortalities and habitat damage would be expected to occur if an oil spill of this nature were to happen and impinge directly on sea otter habitat along Washington’s Olympic Peninsula and Strait of Juan de Fuca coastlines.

However, due to the lack of documented mortalities or serious injuries resulting from other human-caused sources and the unpredictability of oil spills, we are unable to provide an estimate of the annual mortality and serious injuries associated with other human-caused mortality and serious injury.

Harvest by Northwest treaty Indian tribes

Native Americans of the Pacific Northwest have adjudicated treaty rights to various fish and wildlife resources in Washington State. Currently there is no authorization for harvest of sea otters by Native Americans; however, there is a developing interest in such a program. As affirmed by the Court of Appeals for the Ninth Circuit in Anderson v. Evans (9th Cir. June 7, 2004), any intentional take of sea otters by Native Americans other than Alaskan natives residing in Alaska has to be authorized under the MMPA.

STATUS OF STOCK

The Washington sea otter stock is not listed as “depleted” under the MMPA nor listed as “threatened” or “endangered” under the Endangered Species Act. Sea otters are listed by the State of Washington as “State endangered” under Revised Code of Washington 77.12.020 and Washington Administrative Code (WAC) 232.12.014 due to small population size, restricted distribution, and vulnerability (Lance et al. 2004). The WDFW finalized their sea otter recovery plan in 2004 (Lance et al. 2004).

This stock is not classified as strategic because the population is growing and is not listed as “depleted” under the MMPA or “threatened” or “endangered” under the Endangered Species Act of 1973.

The lower end of the Optimum Sustainable Population (OSP) range is assumed to occur at approximately 60 percent of the maximum population size the environment will support (i.e. carrying capacity) (DeMaster et al. 1996). The total carrying capacity estimate for Washington is 1,836 sea otters (95 CI 1,386 – 2,286) (Laidre et al. 2002). The current population estimate of 790 (Jameson and Jeffries 2006) is below the lower end of the OSP (60 percent of 1,836).

The mortality and serious injury for the Makah Northern Washington Marine Set Gillnet Fishery is estimated to be a minimum of two mortalities annually when there is fishing effort. We are unable to provide an estimate of the annual mortality and serious injury associated with other fisheries and other sources of human-caused mortality and serious injury, due to the lack of information. Therefore, we are unable to determine whether the level of human-caused mortalities and serious injuries are insignificant and approaching a zero mortality and serious injury rate.

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