

Volume III, Chapter 17

Steller Sea Lions

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17.0 Steller Sea Lion (*Eumetopias jubatus*)

17.1 Introduction

The Steller sea lion (*Eumetopia jubatus*) is the largest of the eared or otariid seals in northwest waters and are present year-round. Both sexes occur in Washington and Oregon waters, with adult males (to 2,200 lbs) being considerably larger than females (to 700 lbs). Breeding rookeries are located along the Oregon and British Columbia coasts. No breeding rookeries are found in Washington. Coloration varies from tawny through yellowish brown to dark brown. Vocalizations from adults can be described as a deep growling sound (Jeffries et al. 2000).

Steller (or northern) sea lions range along the North Pacific from California to Russia and Japan (Loughlin et al. 1984). For management purposes the Steller sea lion population is divided into two distinct population segments or stocks that are designated as the Western U.S. and Eastern U.S. Steller Sea Lion Stocks (Angliss and Lodge 2002). Steller sea lions west of 144° W. longitude (near Cape Suckling, AK) covering western Alaska to Russia and Japan form a distinct population segment and are identified as the Western U.S. Stock by National Marine Fisheries Service (NMFS). Steller sea lions east of 144° W. longitude covering S.E. Alaska and south into British Columbia, Washington, Oregon, and California form another distinct population segment and are identified as the Eastern U.S. Stock of Steller Sea Lions (Federal Register Vol. 62 No. 86:24345-24355). Steller sea lions in Washington and Oregon waters are considered part of the Eastern U.S. Stock (Angliss and Lodge 2002).

Steller sea lions are protected under the Endangered Species Act (ESA) and Marine Mammal Protection Act (MMPA). The Western U.S. stock is listed as “Endangered” under the ESA, and the Eastern U.S. Stock is listed as “Threatened” under the ESA. Steller sea lions are listed as a state “Endangered” species by the states of Washington and Oregon.

17.2 Life History & Habitat Requirements

17.2.1 Life History

17.2.1.1 Diet

Steller sea lions are an opportunistic predator that feeds primarily on fish and squid, with prey varying by season, area and water depth (Fiscus and Baines 1966; Antonellis and Fiscus

1980, Sinclair and Zeppelin 2002). In the waters off California and Oregon, their diet consists of Pacific whiting, herring, salmon, lamprey, rockfish, flatfish and squid (Fiscus and Baines 1966, Beach *et al.* 1985; Riemer and Brown 1997). Prey identified from stomach and scats in British Columbia included Pacific whiting, herring, octopus, Pacific cod, rockfish, and salmon (Spalding 1964). In the Rogue River, lamprey made up 87% of the prey eaten at the surface (Jameson and Kenyon 1977). Scats from the Rogue Reef rookery show that Pacific whiting (in 62-100 percent of scats) and Pacific lamprey (in 2-83 percent of scats) were the two most common prey of Steller sea lions during the late May to July breeding season (Riemer and Brown 1997). Other commonly eaten prey also included Pacific herring, rockfish, flatfish and cephalopods. Salmon remains in the diet ranged from 6-33 percent (Table 17-1). Predation on salmon occurs but is not considered a primary prey of this species (NMFS 1992a). Although the South Jetty at the Columbia River is a traditional Steller sea lion haulout used by several hundred animals and is a location where scats could be collected to determine diet, no comprehensive study has been conducted to address Steller sea lion diet in the Columbia River.

Table 17-1. Summary of food habit studies for Steller sea lions at Rogue Reef, Oregon. Prey species indicated occurred in at least 10 percent of samples except for salmonids (Riemer and Brown 1987).

Source:	Reimer and Brown 1997
Location:	Rogue Reef, Oregon
Season and Year:	May 1986
Sample Size:	60
Type:	Scats
Prey species	% of Samples
Pacific whiting	73
Skate	38
Pacific lamprey	37
Salmon sp.	33
Pacific herring	33
Smelt	27
Octopus	18
Sculpin	18
Various Rockfish	17
Other species: Northern anchovy, Northern clingfish, rex sole, and sculpin	
Source:	Reimer and Brown 1996
Location:	Rogue Reef, Oregon
Season and Year:	June 1986
Sample Size:	18
Type:	Scats
Prey species	% of Samples
Pacific lamprey	83
Pacific whiting	67
Various Flatfish	17
Various Rockfish	11
Squid	11
Salmon sp.	6
Other species: Northern anchovy, Northern clingfish, rex sole, and sculpin	
Source:	Reimer and Brown 1997

Location: Rogue Reef, Oregon
 Season and Year: May 1986
 Sample Size: 60
 Type: Scats

Prey species	% of Samples
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Pacific whiting	73
Skate	38
Pacific lamprey	37
Salmon sp.	33
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Other species: Northern anchovy, Northern clingfish, rex sole, and sculpin

Source: Reimer and Brown 1996
 Location: Rogue Reef, Oregon
 Season and Year: June 1986
 Sample Size: 18
 Type: Scats

Prey species	% of Samples
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Pacific lamprey	83
Pacific whiting	67
Various Flatfish	17
Various Rockfish	11
Squid	11
Salmon sp.	6

Other species: Northern anchovy, Northern clingfish, rex sole, and sculpin

Source: Reimer and Brown 1996
 Location: Rogue Reef, Oregon
 Season and Year: July 1990
 Sample Size: 46
 Type: Scats

Prey species	% of Samples
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Pacific whiting	96
Pacific lamprey	26
Pacific herring	20
Salmon sp.	17

Other species: Jack mackerel, Pacific mackerel, spiny dogfish, Pacific hagfish, Pacific staghorn sculpin, surfperch, and squid

17.2.1.2 Reproduction

Breeding adult Steller sea lion as well as some juveniles, occupy breeding rookeries from late May to early July, with pregnant females usually arriving at the rookery several days before pups are born (Pitcher and Calkins 1981; Gisiner 1985). Pregnant females generally arrive 3 days before pups are born (Gentry 1970) and continue to maintain site fidelity to a rookery of choice (Sandegren 1970). Copulation usually occurs on the breeding territory within two weeks

postpartum (Gentry 1970, Sandegren 1970) with the female usually only copulating with one male (Gisiner 1985). Females generally return to rookeries of the birth to pup and breed (NMFS 1992b).

17.2.1.3 Migration and Seasonal Movements

Steller sea lions are not known to migrate, but they do disperse widely outside of the breeding season with males typically dispersing away from their breeding rookeries (NMFS 1992b). During the fall and winter in Alaska, sea lions may occur at rookeries and haulout locations that are used in the summer and they may also be seen away from haulouts or rookeries (NMFS 1992b). Animals marked at rookeries in the Gulf of Alaska have been sighted in southeast Alaska and British Columbia, and animals marked in British Columbia have been seen in Alaska (Calkins and Pitcher 1982, Calkins 1986). Steller sea lions tagged as pups at Rogue Reef in Oregon have been resighted in northern California, Washington, British Columbia, and southeast Alaska (R. Brown, ODFW, unpubl. data).

17.2.2 Habitat Requirements

17.2.2.1 Breeding Habitat

There are four Steller sea lion haulout areas but no rookeries in Washington (Jeffries et al. 2000). The main breeding rookeries for Steller sea lions along the Oregon coast are located at Rogue and Orford Reefs, with relatively small breeding rookeries located at Sea Lion Caves and Three Arch Rocks (Brown 1988, NMFS 1992b). Eight additional haulout sites are used by Steller sea lions in Oregon. Pup numbers have increased with total combined counts at Orford and Rogue Reefs of 1,020 in 1996 and 1128 in 2002 (ODFW, unpubl. data). The total Steller sea lion population (including pups) in Oregon during the breeding season was estimated at about 5,076 animals (R. Brown, ODFW, pers. comm., ODFW, unpubl. data).

17.3 Population & Distribution

17.3.1 U.S. Population

The most recent population estimate for Steller sea lions in the two U.S. stocks are based on combining aerial and ground counts of pups and non-pups made throughout the Steller sea lion range. The estimate for the Western U.S. Stock was 34,595 (Angliss and Lodge 2002) and was based on non-pups counted in 2000 and pups counted in 1998 (Sease et al. 2001, Sease and Loughlin 1999). The estimate for the Eastern U.S. Stock was 31,028 (Angliss and Lodge 2002) and was based on aerial and ground counts of rookeries and haulout sites in California, Oregon, Washington, and British Columbia (Angliss and Lodge 2002).

17.3.2 Distribution

Steller sea lions occur year round in Washington and Oregon nearshore waters, and include both breeding and non-breeding animals. The main breeding rookeries for Steller sea lions along the Oregon coast are located at Rogue Reef and Orford Reef; with relatively small breeding rookeries located at Sea Lion Caves and Three Arch Rocks (Brown 1988, NMFS 1992b). Additional haulout locations in Oregon are located at Cape Arago, Cascade Head and South Jetty of the Columbia River. Although both adult male and female Steller sea lions are present in Washington, no breeding rookeries occur. Haulout locations are found along the outer Washington coast at Split Rock, Carroll Island, Bodelteh Island, Cape Alava and Tatoosh Island (Jeffries *et al.* 2000). Seasonal abundances range from 500-1,500 animals along the outer

Washington coast. Relatively small numbers of Steller sea lions occur at haulout locations in the inland waters of Washington, although 500-1,000 animals move through the Strait of Juan de Fuca and into British Columbia waters annually to feed on herring spawning in the Strait of Georgia north of Nanaimo (P.Olesiuk, Fisheries and Oceans-Canada, pers. comm.).

17.4 Status & Abundance Trends

17.4.1 Status

Steller sea lions are protected under the federal MMPA and ESA, as well as being designated as protected wildlife species by the states of Washington and Oregon (WAC 232-12-011; OAR 635-044-013). Washington and Oregon also list the Steller sea lion as a state “Threatened” species. The Eastern U.S. Stock of Steller sea lions that occur in Washington and Oregon are listed as “Threatened” under the ESA, and are therefore designated as “Depleted” under the MMPA as well (Angliss and Lodge 2002).

17.4.2 Trends

17.4.2.1 U.S. Eastern Stock

In recent years attention has been focused on the U.S. Western Stock due to a precipitous decline since the 1970s of about 85% (Braham et al., 1980, Merrick et al., 1987, Loughlin et al., 1992, Trites and Larkin 1996, Sease et al., 2001) resulting in an “Endangered” classification under the ESA. In the case of the U.S. Eastern Stock that includes animals at rookeries and haulout sites from California, Oregon, Washington, British Columbia, and southeast Alaska, population estimates have in general been increasing (Calkins et al., 1999, Olesiuk 2001, Brown et al., 2002). A number of smaller rookeries and haulout locations in California have declined substantially (Le Boeuf et al., 1991, Hastings and Sydeman 2002). The Eastern U.S. Stock of Steller sea lions that occur in Washington and Oregon are listed as “Threatened” under the ESA.

Washington: In Washington, Steller sea lions occur four major haulout sites along the Olympic Peninsula coast throughout the year. Counts of nonpups have been made during the breeding season during most years since the early 1990’s (Figure 1). During that period, numbers of sea lions counted increased on average 9.2%/yr. These animals are assumed to be immature animals and nonbreeding adults associated with rookeries from other areas. Older records suggest the current population in Washington is reduced from historical levels with 2,000-3,000 Steller sea lions reported during August and September of 1914, 1915, and 1916 in the Carroll Island area (Kenyon and Scheffer 1959, Scheffer 1995) while the maximum observed during 60 complete surveys of Washington haulouts between 1980 and 2001 was 1,275 (Steven Jeffries, WDFW, unpubl. data).

Oregon: Along the Oregon coast, Steller sea lion occupy two rookeries at Rogue Reef and Orford Reef, as well as using eight additional haulout sites. The total number of non-pup sea lions counted during breeding season surveys at all of these sites has increased from 1,461 in 1977 to 3,648 in 2001 an annual rate of increase of about 3.7% (R. Brown, ODFW, unpubl. data). Although not nearly as well documented, pup numbers also appear to have increased. In 1996, 685 and 335 pups were counted at Rouge Reef and Orford Reef respectively, while in 2002, 746 and 382 pups were counted at the two sites. The total Steller sea lion population, including pups, associated with Oregon rookeries is estimated at about 5,076 animals based on the 4.5 pup multiplier previously discussed.

With the exception of rookeries in California, the Eastern U.S. Stock of Steller sea lions that includes animals in Washington and Oregon has increased at over 3% annually since the 1970s. The Steller sea lion population in Southeast Alaska, British Columbia, and Oregon has more than doubled in this time. The rookeries at Saint George Reef and Sugarloaf Island in northern California are near levels recorded early in the 20th century.

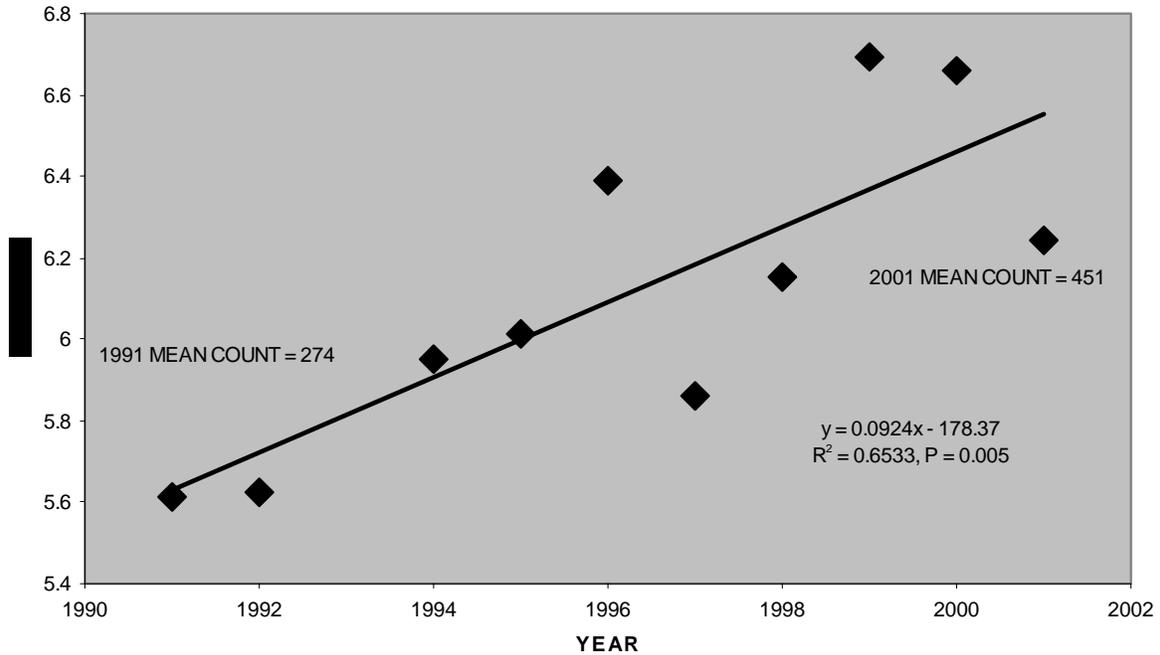


Figure 17-1. Trends in Steller sea lion abundance at Washington haulout sites from 1991 to 2001 (Steven Jeffries, WDFW, unpubl. data).

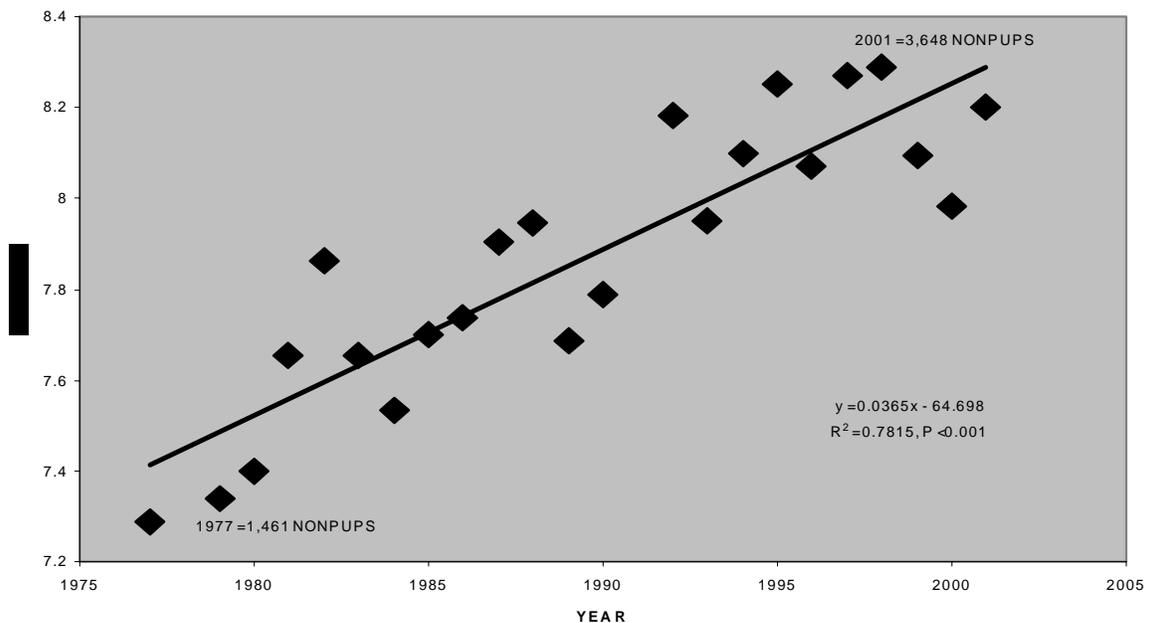


Figure 17-2. Trends in non-pup counts of Steller sea lions at Oregon rookery sites from 1977 to 2001 (R. Brown, ODFW, unpubl. data).

17.4.2.2 Steller Sea Lions in the Columbia River

Historical data on Steller sea lion abundance in Columbia River is limited, although some animals were reported upriver as far as the mouth of the Willamette River (Lyman et al. 2002). Numbers in Washington and Oregon including the Columbia River were believed to be substantially reduced due to extensive human caused mortality, in part stimulated by a bounty (Pearson and Verts 1970). Counts of Steller sea lions at the South Jetty of the Columbia River typically peak during the winter months with peak counts of 50-60 animals reported by Beach et al. (1985). Beach et al. (1985) also reported a small number of Steller sea lions sighted upriver past Tongue Point apparently feeding on eulachon in the winter. Recent surveys by WDFW and ODFW show a substantial increase in Steller sea lion abundance at the South Jetty with peak counts of 300-700 animals recorded (WDFW, unpubl. data, ODFW unpubl. data). In 2003, a small number of Steller sea lions were reported at Bonneville Dam (R. Stansell, USACOE, pers. comm.).

17.4.3 Environmental Conditions

17.4.3.1 Rookery and Haulout Sites

Steller sea lion rookeries are areas where animals congregate for pupping and breeding, and usually occur on beaches of relatively remote islands or reefs (NMFS 1992). Haulout sites are locations used by breeding, non-breeding, and subadult sea lions during the non-breeding season (NMFS 1992b). Similar to California sea lions, Steller sea lion haulout sites are typically associated with jetties, offshore rocks and islands, logbooms, marina docks, and navigation bouys (Jeffries et al. 2000). Although rookeries and haulout sites occur in many types of areas, locations are used on an annual basis and change little from year to year. In Washington, Steller sea lions use haulout sites along the Olympic Peninsula coast in the vicinity of Split Rock, Carroll Island, Cape Alava, and Tatoosh Island (Jeffries et al. 2000). On the Oregon coast, Steller sea lions use rookery sites at Rogue Reef and Orford Reef, and haulout at Rogue Reef, Orford Reef, Cape Arago, Sea Lion Caves, Cascade Head, Three Arch Rocks, and tip of the South Jetty at the mouth of the Columbia River.

17.4.3.2 Seasonal Use

Use of the South Jetty haulout site at the mouth of the Columbia River by Steller sea lions is associated with movements of animals in Oregon and Washington coastal waters associated with their May to July breeding season. At this time, Steller sea lion abundance is lowest as adults return to breeding rookeries at Rogue Reef and Orford Reef, as well as rookeries in British Columbia. Following the breeding season, Steller sea lion abundance increases at the South Jetty and is associated with seasonally abundant prey in the river and offshore such as eulachon, salmon, and Pacific whiting that are important prey (Beach et al. 1985, Fiscus and Baines 1966). Maximum abundances of Steller sea lions at the South Jetty typically have been recorded in fall and winter when seasonally abundant prey ie Pacific whiting, salmon, and eulachon, are present in or near the Columbia River. Although few Steller sea lions move upriver beyond Tongue Point (Beach et al. 1985), a few individuals were reported at Bonneville Dam in 2003 during spring chinook run (R. Stansell, USACOE, pers. comm.).

17.5 Factors Affecting Population Status

Drift gillnet fisheries in the Columbia River have the potential to take Steller sea lions incidental to the fishery (Beach et al. 1985). However, because few Steller sea lions move very far upriver in the Columbia, the likelihood of incidental takes are considered minimal.

New construction, repairs or alteration of jetty design may influence use by Steller sea lions, as the tip of the South Jetty is regularly used as a haulout location.

17.6 Inventory & Assessment of Existing Management and Conservation Plans

The MMPA as well as the Endangered Species Act protect Steller sea lions. Both species are also protected by state regulations (WAC 232-12-011 and OAR 635-044-013).

A recovery plan exists for Steller sea lions under the ESA (NMFS 1992b).

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