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Memorandum For: The Record

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Subject: Surveys of Steller Sea Lions in Alaska, June-July 2010

SUMMARY: NMFS conducted surveys in summer 2010 to assess abundance, trends, and distribution of Steller sea lions (*Eumetopias jubatus*) in Alaska. An aerial photographic survey to assess adult and juvenile (non-pup) sea lions was conducted from southeast Alaska through Amchitka Pass in the Aleutian Islands from 7 June to 3 July 2010 using a NOAA Twin Otter aircraft. A second aerial survey was conducted from 10-13 July 2010 from the southwestern tip of the Kenai Peninsula through southeast Alaska to obtain a replicate, 'late' non-pup count to assess movement between the threatened eastern and endangered western distinct population segments (DPSs, or stocks) during the breeding season. An additional objective during the aerial surveys was to estimate pup production at sites surveyed at least 10 days after the mean sea lion birth date (which ranges between 4-14 June in Alaska). NMFS also counted pups and non-pups (on-site counts) at five rookeries and haulouts in the western Aleutian Islands on 22-24 June and counted pups at the Walrus Island rookery (near the Pribilof Islands in the Bering Sea) on 16 July using the USFWS RV *Tiglax*.

It is not possible to provide an updated estimate of non-pup population trend for the entire western DPS in Alaska using the 2010 survey results due to the large number of trend sites missed because of weather and the closure of the runway at Eareckson Air Force Base on Shemya Island. However, even if we had surveyed all western DPS trend sites, determination of overall western DPS trend would have been affected, as it has been since 2008, by the apparent movement of animals during the breeding season between the eastern Gulf of Alaska and southeast Alaska. For the western DPS in Alaska, there continues to be considerable regional variability in non-pup abundance and pup production. Counts of pups and non-pups continue to decline in the western Aleutian (172°-177°E) and part of the central Aleutian Islands (177°W-180°). One site in the western Aleutians (Buldir) has ceased to function as a rookery and another (Attu/Cape Wrangell) will likely revert to a haulout within 5 years if the current rate of decline in pup production continues. By contrast, between 174°-177°W in the central Aleutian Islands, pup production at Kanaga, Adak, and Kasatochi rookeries has almost tripled since the early 1990s, and in the eastern Aleutians between 165°-170°W, trends in counts of both pups and non-pups are positive. But in between these increasing areas (from

170°-174°W), pup and non-pup counts have been stable since the mid-1990s. Similarly, the stable sea lion population in the central Gulf of Alaska is bordered by increasing populations in the western and eastern Gulf of Alaska. This pattern of regional population trends suggests that sea lions are responding less to ecosystem-wide environmental or anthropogenic forces, and more to forces that vary longitudinally and at meso-scales (~100-150 nm, or ~3-5° longitude).

METHODS

Aerial Photographic Survey

Aerial surveys for non-pup Steller sea lions are conducted in June and early July, when the greatest proportion of adults is onshore to give birth and breed. Both the threatened eastern DPS and endangered western DPS inhabit Alaska, with the former breeding on 5 rookeries east of 144°W in southeast Alaska (SEAK) and the latter on 39 rookeries between 144°W and 172°E. NMML estimates regional and stock-wide population trends by monitoring abundance at a group of ‘trend’ sites that have been consistently monitored and have had the majority (between 62-72% in SEAK, and between 88-96% in the western DPS) of all animals counted since 1991.

NMML divides the Alaska Steller sea lion range into various geographic regions and areas for the purpose of trend analysis (Figure 1). The original scheme (and that used in the Steller sea lion recovery plan; NMFS 2008) has 7 regions in Alaska: SEAK (part of the eastern DPS), plus 6 regions in the range of the western DPS: eastern, central and western Gulf of Alaska (E GULF, C GULF, and W GULF, respectively) and the eastern, central and western Aleutian Islands (E ALEU, C ALEU and W ALEU, respectively). Because of variation in trend that exists at finer scales than the traditional 7 regions, particularly in the Aleutian Islands, NMML developed an 11-area scheme, each composed of at least 2 rookeries and various numbers of trend haulouts; these areas are called rookery cluster areas, or RCAs.

The primary objective in 2010 was to survey all terrestrial rookery and haulout sites (N=366), plus each trend site (N=194) in Alaska from Dixon Entrance in SEAK (134°W) to Attu Island (172°E) at the western end of the Aleutian Islands during the initial non-pup survey (7 June – 3 July; Table 1; Figure 1). We successfully surveyed 137 trend sites (71%) and 259 sites overall (71%; Figure 1, Table 1). All trend sites and most of the sites overall were surveyed in RCAs 3-5 (from Amchitka Pass through the Islands of Four Mountains in the C ALEU) and RCAs 9-11 (Kodiak Island east through SEAK, which is the eastern half of the C GULF and all of the E GULF and SEAK). RCAs 6 (~E ALEU) and 8 (western half of the C GULF) were incompletely surveyed, and we were unable to survey any sites in RCAs 1 (W ALEU), 2 (Kiska Island to Amchitka Pass in the C ALEU), and 7 (~W GULF). Sites in RCAs 1 and 2 (42 sites overall and 28 trend sites) were missed because the airport at Eareckson Air Force Base on Shemya Island was unavailable to us while the runway was being resurfaced. Five trend sites in RCA 1 were surveyed from the ground during the RV *Tiglâx* trip on 22-24 June. Overall, 68 sites,

which includes 34 trend sites, were missed in RCAs 6-8 due to bad weather (e.g., fog, low ceilings, wind) and because of time lost for aircraft repair.

A secondary objective in 2010 was to re-survey all terrestrial rookery and haulout sites near the eastern DPS-western DPS boundary (RCAs 10 and 11) in early July to assess movement between the stocks during the breeding season. We successfully surveyed 69 of 106 sites overall (65%) and 34 of 36 trend sites (94%) during the movement survey on 10-13 July (Table 1; Figure 1), which is approximately 2.5 weeks later than the 'late' survey conducted in 2009 (24-27 June). During the initial non-pup survey, RCAs 10 and 11 were surveyed during 7-9 June, which is identical to the survey dates in this area in 2008. On 10-11 July 2010, all trend sites and all but two haulouts (which have had a total of only 13 sea lions counted in all surveys conducted from 2000-2010) were re-surveyed in RCA 10. Because of time constraints at the end of the contract time window, 29 sites in RCA 11 were not surveyed during the movement survey; these 29 sites had no animals during the initial 2010 non-pup survey and have had very low numbers during all breeding season surveys conducted since 2000. However, due to weather (fog) on the last survey day available, we were unable to survey 6 sites (including 2 trend rookeries at White Sisters and Graves Rock) that had a total of 4,592 non-pups (2,614 at the trend sites) during the initial survey.

A third objective in 2010 was to assess pup production at sites surveyed at least 10 days after the mean sea lion birth date in Alaska. From east to west in Alaska, mean birth dates are 4 June in SEAK, 14 June in the E GULF, and 11 June in the C GULF, W GULF and Aleutian Islands (Pitcher et al. 2001). A total of 33 sites with pup counts >0 were surveyed at least 10 days after the regional mean sea lion birth date.

We used a NOAA Twin Otter aircraft to conduct the survey. Sites with very low numbers of animals hauled out (< 10) were counted by observers on the aircraft. This occurred at 129 sites during the initial non-pup survey and at 30 sites during the movement survey. Sites with ten or more non-pups hauled out were photographed using three Canon EOS-1Ds Mark III digital cameras equipped with 85 mm manual focus Zeiss telephoto lenses mounted in the belly of the plane. The center camera was mounted vertically while the port and starboard cameras were mounted obliquely at a 21° angle, pointing inward towards the center camera. The cameras were mounted in a forward motion compensator (FMC) to minimize blur. The optimum survey altitude is 750 ft (which provided an approximate 1000 ft wide swath with the three cameras), but due to low ceilings, wind speeds, and topography some sites were photographed at altitudes ranging from 600-1300 ft. The desired ground speed was 90 kts, but ranged from 85-110 kts depending on wind speed and direction. Cameras were set to aperture priority (f5.6) and ISO to 800. Lenses were focused manually and set to near infinity.

Four researchers working independently counted all adult, juvenile and newborn Steller sea lions on land at each terrestrial site photographed during the 2010 survey. Sites were distributed among researchers to ensure a replicate count at each site. Sea lions were counted off digital photographs using high resolution monitors and Adobe Photoshop software (mention of specific products does not serve as an endorsement). Initial total

counts of non-pups (juveniles, adult females, sub-adult males and adult males) at each site by each researcher were compared; if the difference in total non-pup counts at a site was greater than 5%, counted photographs were compared to reconcile the discrepancies. A similar comparison and reconciliation occurred for all pup counts. If sea lions were disturbed into the water by the survey aircraft, every effort was made to count them, but animals that were in the water near undisturbed sites were not counted. Total counts of non-pups by the two teams of researchers at all sites surveyed in 2010 (~ 52,000 non-pups) differed by 0.7%. Total counts of pups (within the appropriate time frame) by the two teams in 2010 (~8,400 pups) differed by 1.6%. All pup and non-pup counts reported here are means of the replicate counts (rounded to the nearest whole pup) for each photographed site or the visual count recorded by the observer for those sites with few sea lions.

On-Site Pup and Non-Pup Counts

Sea lion haulout and rookery sites were visited in the W ALEU during 22-24 June 2010 (Table 1), and at Walrus Island, one of the Pribilof Islands in the Bering Sea on 16 July 2010. Transport of the scientific gear and party was aboard the RV *Tiġlâx*, a 121' United States Fish and Wildlife Service research vessel used to support the Alaska Maritime Wildlife Refuge. When ashore, observers searched for dead pups and adults, and counted the numbers of non-pups and pups on land. Observations were conducted from a distance, usually downwind and with a good view of the rookery. Additionally, the scientific party made a general assessment of how to gain access to the rookery in a manner that was safe for the scientific party and minimized the level of disturbance associated with moving adult sea lions to the intertidal regions of the rookery – all the while keeping pups safe on the rookery.

RESULTS

Counts of Steller sea lion non-pups from 2004-2010 at all western DPS trend sites are listed in Table 2 and at all western DPS non-trend (other) sites are listed in Table 3. Non-pup counts from 2002-2010 at all eastern DPS sites in SE AK are listed in Table 4. Surveys during each of these years employed high resolution, vertical photography. Pup counts at all rookeries in Alaska between 1990 and 2010, and at a small number of haulouts with >0 pups in 2010, are listed in Table 5.

Non-pup Counts by Recovery Plan Regions W ALEU through the C GULF

We were unable to survey numerous trend sites in the W ALEU, C ALEU, E ALEU, and W GULF in 2010, and as a result, there is no new trend site total for the entire western DPS in Alaska. All trend sites were surveyed in the C GULF in 2010 resulting in a total slightly lower than in 2008 (Table 6A), and the trend in the C GULF region since 2000 remains stable ($P>0.1$).

Non-Pup Counts in RCAs 1-9

We were unable to survey numerous trend sites in RCAs 2 and 7 in 2010. However, there are enough data from the complete surveys in RCAs 3-5 and 9, and the partial surveys in RCAs 1, 6 and 8 to update many regional trends (Figure 2). From west to east by RCA:

- RCA 1: Counts in 2010 at all 4 rookeries and 1 haulout (the largest 5 of the 10 trend sites) indicate that the population is declining at -9% per year ($P < 0.001$) since 1991.
- RCA 2 (Kiska through Amchitka): No new data for 2010; population declined at -6% per year ($P < 0.001$) from 1991-2008.
- RCA 3 (Delarof Islands): Continued decline in trend site counts through 2010. Rate of decline from 2000 to 2010 has increased to -1.6% per year ($P = 0.050$); it was -1% per year (stable; $P = 0.243$) through 2008.
- RCA 4 (Tanaga through Atka): Counts were greater in 2010 than in 2008 (+438), but have been highly variable since 2000 and the trend is stable ($P > 0.1$).
- RCA 5 (Amlia through Yunaska): Counts in 2010 were similar to 2008 (-65), and the trend since 2000 is stable ($P > 0.1$).
- RCA 6 (similar to the E ALEU): Counts in 2010 in the western portion of RCA 6 from Samalga Pass through Unalaska Island are consistent with an increasing trend in this area. Counts in the central portion of RCA 6 (the Krenitzen Islands) increased faster from 2000 to 2008 than in the western portion of RCA 6. Counts have largely been stable in the Bering Sea portion of RCA 6 since the mid-1990s.
- RCA 7 (similar to the W GULF): No new data for 2010; population increased at 4.5% per year ($P = 0.011$) from 2000-2008.
- RCA 8 (western half of the C GULF): Counts in 2010 at both rookeries and 4 of the 6 largest trend haulouts were greater than in 2008 (+194) but the trend since 2000 is stable ($P > 0.1$).
- RCA 9 (eastern half of the C GULF): Counts in 2010 were 332 less than in 2008, but the trend since 2000 is stable ($P > 0.1$).

Non-Pup Counts in RCAs 10-11 (E GULF and SE AK): Movement Survey

In 2010, counts of non-pups at all sites in RCA 10 were 1,521 greater on 10-11 July than on 8-9 June; this was an increase of 34% in ~1 month (Tables 2-3; Figure 3). The increase at trend sites (+1,703, or 45%) was greater than that observed at all sites. The difference is primarily due to large increases in numbers at two trend haulouts, Cape St. Elias (+932) and Glacier Island (+563; Table 2). Seal Rocks rookery had the most animals of any single site in RCA 10 in early June (1,042), and had nearly identical numbers in July (1,036). Most of the increase between the two surveys, 75% at all sites and 88% at trend sites, occurred in the eastern portion of RCA 10 from Cape St. Elias through Prince William Sound.

A total of 15,776 non-pups were counted at all sites in SEAK (RCA 11) on 7-8 June, with 9,644 at trend sites (Table 4; Figure 3). On 12-13 July, a total of 10,803 non-pups were counted (6,155 at trend sites), but 6 sites (including 3 trend sites) could not be re-

surveyed. Non-pup counts in June on these 6 sites totaled 4,592 with 2,820 at the 3 trend sites, which represented 29% of all animals counted on SEAK sites during the June survey. Therefore, the July survey could have missed almost 1/3 of all animals in SEAK if they were distributed as they were in June. If we compare counts between June and July at only those sites surveyed in July, non-pup counts decreased 381 at all sites (-3%) and 868 (-12%) at trend sites.

Pup Counts

The 2010 aerial survey was designed primarily to count non-pups across Alaska, but survey timing at certain sites was also suitable to assess pup production (Table 5; Figure 4). In addition, pups were counted on land in the W ALEU (=RCA 1) and at Walrus Island (Pribilof Islands) in the Bering Sea.

Pup counts in 2 of 6 western DPS recovery plan regions were updated in 2010 (Table 6B). In the W ALEU, pup production at the 4 rookeries in 2010 was 55 less than in 2008, and counts continue to decline at -10% per year ($P=0.001$) since 1997. In the E GULF, pup production at Seal Rocks and Wooded (Fish) Island in 2010 was 60 less than in 2009, but pup production is increasing here at +4.7% per year ($P=0.008$) since 2001-02.

From west to east by RCA:

- RCA 1 = W ALEU: Counts in 2010 at all 4 rookeries and 1 haulout indicate that pup production continues to decline at -10% per year ($P=0.001$) since 1997. Buldir Island has ceased to function as a rookery, and if current trends continue, Attu/Cape Wrangell could also cease to function as a rookery within 5 years.
- RCA 2 (Kiska through Amchitka): No new data for 2010; pup production declined at -6% per year ($P<0.001$) from 1991-2008 at the 4 rookeries in RCA 2.
- RCA 3 (Delarof Islands): Counts in 2010 at all 3 rookeries indicate that pup production continues to decline at -4% per year ($P<0.001$) since 1991.
- RCA 4 (Tanaga through Atka): Pup counts at all 3 rookeries in 2010 were slightly lower than in 2009 (-58), but pup production has been increasing at +5% per year ($P=0.003$) since 1990.
- RCA 5 (Amlia through Yunaska): Pup counts in 2010 at both rookeries were similar to 2009 (-7), and the trend since 1994 has been stable ($P>0.1$).
- RCA 6 (E ALEU): Pup counts in 2010 at 2 of 7 rookeries in the E ALEU were 9% higher (+68) than in 2009, and pup production increased overall at +4.3% per year ($P=0.023$) between 1998 and 2009.
- Walrus Island (Bering): Only 14 pups were counted on Walrus in 2010, a drop of over 50% since 2005. Pup production has been declining at Walrus at -10% per year ($P<0.001$) since 1960 when 2,866 pups were counted, and this site has largely ceased to function as a rookery.
- RCA 7 (W GULF): No new data for 2010; pup production increased at +2.8% per year ($P=0.033$) from 1998-2008 at the 4 rookeries in RCA 2.
- RCAs 8 and 9 (C GULF): No new data for the 4 rookeries in RCAs 8-9 in 2010; pup production was stable ($P>0.1$) between 1998 and 2009.

- RCA 10 (E GULF): Pup counts at the 3 rookeries in 2010 were 60 lower than in 2009, but pup production has been increasing at +4.7% per year (P=0.008) since 2001-02. The pup count in 2010 at Outer Island rookery (part of the C GULF but in RCA 10) was identical to the number counted in 2009.
- RCA 11 (SEAK): Pup counts at 3 of 5 rookeries in 2010 were 2,041 lower in 2010 than in 2009. These included the two largest rookeries at Hazy and the Forrester Complex and the smallest rookery at Biali Rock. However, pup production at all 5 rookeries in SE AK increased at +3.5% per year (P=0.003) between 1991 and 2009.

DISCUSSION

There continues to be considerable regional variability in non-pup abundance and pup production trends throughout the range of the western DPS of Steller sea lion in Alaska. This is particularly evident in the Aleutian Islands (RCAs 1-6). Pup and non-pup counts are both declining in all regions west of 177° W (RCAs 1-3, though there are no 2010 data for RCA 2), with trends worsening to the west. One site in the W ALEU (Buldir) had only a single pup in 2010 and has ceased to function as a rookery, while another (Attu/Cape Wrangell) will likely revert to a haulout within 5 years if the current rate of decline in pup production continues. By contrast, near the center of the Aleutian Islands in RCA 4, non-pup abundance has been variable but the trend has been stable since the early 1990s, while pup production at Kanaga, Adak, and Kasatochi rookeries has almost tripled. This is the only group of rookeries in AK west of Samalga Pass (a total of 16 rookeries, or ~40% of all rookeries in the western DPS in AK) that has had a statistically significant increase in pup production in the last two decades. Further to the east in RCA 6, both pup and non-pup trends are positive between Unimak Pass and Samalga Pass, but sandwiched between the increasing RCA 4 and the central/western portion of RCA 6 is RCA 5, where pups and non-pup counts have been stable since the mid-1990s. While only three sites were surveyed in the Bering Sea in 2010 (Amak, Sea Lion Rock, and Walrus Island), sea lion population trends are either stable or declining here as well. This contrasts with the rest of the E ALEU area west of Unimak Pass and the W GULF (RCA 7) which have both had significantly increasing trends since 2000. Similar to RCA 5, the stable sea lion populations in RCAs 8-9 (essentially the C GULF) are bordered by increasing populations to the west (RCA 7, or W GULF) and east (RCA 10, or E GULF). The pattern of regional population trends suggests that sea lions are responding less to ecosystem-wide environmental or anthropogenic forces, and more to forces that vary longitudinally and at meso-scales (~100 nm, or 3° longitude).

It is not possible to update our estimation of non-pup population trend for the entire western DPS using the 2010 survey results primarily due to the large number of trend sites missed in the W GULF, E ALEU, C ALEU and W ALEU. However, even if we had surveyed these sites, determination of overall western DPS trend would have been affected, as it has been since 2008, by the apparent movement of animals during the breeding season in the E GULF and SEAK areas. The initial hypothesis proposed in 2008 was that some eastern DPS animals were in the E GULF early in the breeding season, which led to higher than expected counts in this region during the early June 2008

survey. Results of the late June 2009 survey supported this hypothesis: E GULF non-pup counts were lower and the SE AK counts higher than in 2008. In 2010, we conducted both ‘early’ and ‘late’ surveys in the E GULF-SEAK area, but the results do not support the initial hypothesis: ‘early’ 2010 E GULF counts were substantially lower than ‘late’ counts, while the partial ‘late’ 2010 SEAK survey indicated slightly lower abundance than the complete ‘early’ survey. The difference in timing between the 2009 and 2010 ‘late’ surveys may have affected the distribution in these areas. However, the large variability in regional counts observed ~1 month apart in 2010 suggests that further research into the movement of animals across the DPS boundary prior to and during the breeding season is necessary before we can determine how this affects estimation of trends in the E GULF and SE AK, and ultimately on the western DPS as a whole.

On 12 July 2010 when the SE AK rookeries at Hazy, Biali and Forrester were surveyed, most of the pups were near the water in large groups. This not only made counting pups difficult (distinguishing wet black pups from wet black rocks), but some pups were likely in the water and not counted. In 2009, these 3 sites were surveyed 18 days earlier than in 2010 (on 24 June), and we counted a total of 6,156 pups in 2009 (vs. 4,115 in 2010). The 2005 (10 July) and the 2010 survey dates were similar, but 700 more pups were counted in 2005 than in 2010. Some of these differences could be due to mortality of pups in late June/early July, however only 93 dead pups were counted at these three rookeries in 2010 (though carcasses could have been washed into the sea or eaten/dispersed by scavengers). Researchers with the Alaska Department of Fish and Game’s field camp at Lowrie Island (part of the Forrester Complex), in a preliminary analysis, did not report significantly lower numbers of pups or non-pups in 2010 compared to recent previous years (L. Jemison, ADFG, personal communication, 31 January 2010). The 2010 pup counts at Hazy, Forrester Complex and Biali Rock reported here may therefore underestimate actual production in 2010 relative to other counts in the time series, and surveys in subsequent years should help address this issue.

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Table 1. Number of terrestrial Steller sea lion rookery and haulout sites by region, rookery cluster area, in the western DPS (wDPS), and in Alaska overall, and those surveyed during the 2010 non-pup (A) and movement (B) aerial surveys (Figure 1).

A. Non-Pup Survey (7 June-3 July 2010)

Region							Rookery Cluster Area (RCA)						
Region	Sites	Surveyed	%	Trend Sites	Surveyed	%	RCA	Sites	Surveyed	%	Trend Sites	Surveyed	%
SEAK	67	67	100%	17	17	100%	11	69	69	100%	17	17	100%
E GULF	30	30	100%	13	13	100%	10	37	37	100%	19	19	100%
C GULF	58	56	97%	33	32	97%	9	30	30	100%	20	20	100%
							8	26	20	77%	11	7	64%
W GULF	41	3	7%	21	1	5%	7	34	0	0%	17	0	0%
E ALEU	61	33	54%	32	20	63%	6	64	36	56%	35	22	63%
C ALEU	94	65	69%	66	49	74%	5	18	18	100%	17	17	100%
							4	25	25	100%	16	16	100%
							3	20	19	95%	14	14	100%
							2	28	0	0%	16	0	0%
W ALEU	15	5	33%	12	5	42%	1	15	5	33%	12	5	42%
WDPS	299	192	64%	177	120	68%	WDPS	297	190	62%	177	120	68%
AK Total	366	259	71%	194	137	71%	AK Total	366	259	71%	194	137	71%

B. Movement Survey (10-13 July)

Region							Rookery Cluster Area (RCA)						
Region	Sites	Surveyed	%	Trend Sites	Surveyed	%	RCA	Sites	Surveyed	%	Trend Sites	Surveyed	%
SEAK	67	34	51%	17	15	83%	11	69	34	49%	17	15	88%
E GULF	30	26	87%	13	13	100%	10	37	35	95%	19	19	100%
C GULF	9	9	100%	6	6	100%							
WDPS	39	35	90%	19	19	100%	WDPS	37	35	95%	19	19	100%
AK Total	106	69	65%	36	34	92%	AK Total	106	69	65%	36	34	94%

Table 2. Counts of adult and juvenile Steller sea lions at rookery (in bold) and haulout trend sites, 2004-2010. 2010E refers to the non-pup survey conducted 7 June-3 July 2010; 2010L refers to the movement survey conducted 10-13 July 2010. Counts in 2010 in the western Aleutian Islands (W ALEU) are ground counts from RV *Tiglâx* trip; all others from aerial survey using high-resolution, vertical photographs

SITE NAME	REGION	RCA	2004	2006	2007	2008	2009	2010E	2010L
CAPE ST. ELIAS	E GULF	10	318	414	728	1,400	714	558	1,490
CAPE HINCHINBROOK	E GULF	10	496	237	95	229	102	161	0
SEAL ROCKS	E GULF	10	841	1,119	803	1,024	1,007	1,042	1,036
WOODED (FISH)	E GULF	10	523	619	282	603	663	634	886
GLACIER	E GULF	10	620	466	531	509	724	564	1,127
THE NEEDLE	E GULF	10	123	127	145	88	112	111	66
POINT ELRINGTON	E GULF	10	132	58	37	169	162	81	38
CAPE PUGET	E GULF	10	0	0	0	0	10	1	0
CAPE FAIRFIELD	E GULF	10	0	0	10	47	32	27	11
RUGGED	E GULF	10	0	0	0	8	2	0	7
ALEUALIK CAPE	E GULF	10	1	103	161	77	88	74	100
CHISWELL ISLANDS	E GULF	10	72	71	74	68	94	68	186
SEAL ROCKS (KENAI)	E GULF	10	3	4	2	0	13	4	58
OUTER (PYE)	C GULF	10	222	251	268	249	231	269	435
GORE POINT	C GULF	10	0	0	0	0	0	0	0
EAST CHUGACH	C GULF	10	0		0	0	0	0	0
PERL	C GULF	10	49		241	144	151	217	74
NAGAHUT ROCKS	C GULF	10	1		2	21	0	0	0
ELIZABETH/CAPE ELIZABETH	C GULF	10	28		0	0	0	0	0
SUGARLOAF	C GULF	9	667	733	662	849	844	788	
USHAGAT/NW	C GULF	9	3	0	0	0	0	0	
USHAGAT/SW	C GULF	9	101	141	74	96	88	86	
USHAGAT/ROCKS SOUTH	C GULF	9	8	9	0	45	29	28	
LATAK ROCKS	C GULF	9	56		115	108	334	128	
SEA OTTER	C GULF	9	127		100	1	7	6	
RK NEAR SEA OTTER	C GULF	9	10		0	47	20	0	

Table 2 (continued) SITE NAME	REGION	RCA	2004	2006	2007	2008	2009	2010E	2010L
AFOGNAK/TONKI CAPE	C GULF	9	0		0	16	2	0	
SEA LION ROCKS (MARMOT)	C GULF	9	2		1	13	2	0	
MARMOT	C GULF	9	703	686	551	644	749	576	
LONG ISLAND	C GULF	9	32			59	39	0	
KODIAK/CAPE CHINIAK	C GULF	9	87		241	130	117	110	
UGAK	C GULF	9	0		0	0	0	0	
KODIAK/GULL POINT	C GULF	9	109		148	109	89	72	
KODIAK/CAPE BARNABAS	C GULF	9	0		140	84	130	194	
TWOHEADED	C GULF	9	266		228	204	251	244	
SITKINAK/CAPE SITKINAK	C GULF	9	80		104	115	63	76	
KODIAK/CAPE UGAT	C GULF	9	2	167	248	285	270	140	
KODIAK/STEEP CAPE	C GULF	9	0	14	61	38		24	
SHAKUN ROCKS	C GULF	9	104	67	113	81		117	
TAKLI	C GULF	8	85	157	92	67		74	
PUALE BAY	C GULF	8	58	2	1	2		84	
UG ALEUUSHAK	C GULF	8	0	0	2	0			
SUTWIK	C GULF	8	206	114	127	93	106	148	
CHOWIET	C GULF	8	541		424	559	644	653	
CHIRIKOF	C GULF	8	303		300	300	430	262	
NAGAI ROCKS	C GULF	8	330		449	234	218	201	
CHERNABURA	W GULF	7	828		1,228	1,281	1,162		
LIGHTHOUSE ROCKS	W GULF	8	111	153	152	164	123		
KAK	W GULF	8	17	24		1		27	
MITROFANIA	W GULF	8	182	103	116	129			
SPITZ	W GULF	8	1	0	11	1			
KUPREANOF POINT	W GULF	7	53	116	53	72			
CASTLE ROCK	W GULF	7	70	15	38	28			
ATKINS	W GULF	7	651	663	585	558	631		
THE HAYSTACKS	W GULF	7	38	1	41	3			
THE WHALEBACK	W GULF	7	102	99	83	102	103		
NAGAI/MOUNTAIN POINT	W GULF	7	80	56	148	60			

Table 2 (continued) SITE NAME	REGION	RCA	2004	2006	2007	2008	2009	2010E	2010L
SEA LION ROCKS (SHUMAGINS)	W GULF	7	36	142	44	54			
UNGA/ACHEREDIN POINT	W GULF	7	264	152	229	202			
JUDE	W GULF	7	474	338	445	465	512		
PINNACLE ROCK	W GULF	7	1,011	1,167	1,057	1,094	1,132		
CLUBBING ROCKS	W GULF	7	911	1,037	1,063	952	1,023		
CHERNI	W GULF	7	0	0	0	0			
SOUTH ROCKS	W GULF	7	528	320	457	451	434		
BIRD	W GULF	7	57	62	97	155			
ROCK	W GULF	7	17	0	0	0			
UNIMAK/CAPE SARICHEF	E ALEU	6	250	6	0	167	1		
AMAK+ROCKS	E ALEU	6	733	410	220	265	324	366	
SEA LION ROCK (AMAK)	E ALEU	6	456	447	385	360	314	436	
UGAMAK COMPLEX	E ALEU	6	1,304	1,319	1,493	1,619	1,874		
AIKTAK	E ALEU	6	101	111	43	42	61		
TIGALDA/ROCKS NE	E ALEU	6	141	202	236	359	229		
TIGALDA/SOUTH SIDE	E ALEU	6	46	83	105	91			
ROOTOK	E ALEU	6	96	96	141	60			
TANGINAK	E ALEU	6	4	6	4	1			
AKUN/BILLINGS HEAD	E ALEU	6	307	338	523	386			
AKUTAN/REEF-LAVA	E ALEU	6	119	103	57	128	166	98	
AKUTAN/CAPE MORGAN	E ALEU	6	1,021	1,249	1,172	1,135	905	1,298	
OLD MAN ROCKS	E ALEU	6	71	112	81	89		196	
EGG	E ALEU	6	5	0	0	0		84	
OUTER SIGNAL	E ALEU	6	0	0	0	10		52	
UNALASKA/CAPE SEDANKA	E ALEU	6	0	0	0	0		0	
UNALASKA/BISHOP POINT	E ALEU	6	265	285	196	204	195	240	
UNALASKA/MAKUSHIN BAY	E ALEU	6	20	88	154	115		56	
UNALASKA/SPRAY CAPE	E ALEU	6	0	0	0	0		0	
UNALASKA/CAPE IZIGAN	E ALEU	6	238	329	304	188	456	435	
BOGOSLOF/FIRE ISLAND	E ALEU	6	380	358	405	390	399	434	
UMNAK/CAPE ASLIK	E ALEU	6	119	73		63		78	

Table 2 (continued) SITE NAME	REGION	RCA	2004	2006	2007	2008	2009	2010E	2010L
POLIVNOI ROCK	E ALEU	6	91	42	96	93		136	
THE PILLARS	E ALEU	6	4	0	0	0		15	
OGCHUL	E ALEU	6	139	132	152	200	224	268	
VSEVIDOF	E ALEU	6	48	41	35	50		75	
ADUGAK	E ALEU	6	259	429	473	636	620	564	
ULIAGA	C ALEU	6	0	99		66		216	
KAGAMIL	C ALEU	6	1	0		0		51	
CHUGINADAK	C ALEU	6	129	79		53		173	
CARLISLE	C ALEU	5	0	0		27		10	
HERBERT	C ALEU	5	38	66		105		67	
YUNASKA	C ALEU	5	260	255	279	282	298	403	
CHAGULAK	C ALEU	5	0	13		59		54	
AMUKTA+ROCKS	C ALEU	5	2	18	56	35		72	
SEGUAM/FINCH POINT	C ALEU	5	2		0	0		0	
SEGUAM/SW RIP	C ALEU	5	40		31	39		30	
SEGUAM/SADDLERIDGE	C ALEU	5	923		668	835	857	756	
SEGUAM/TURF POINT	C ALEU	5	58		8	3	13	7	
SEGUAM/LAVA COVE	C ALEU	5	0		0	0		0	
SEGUAM/LAVA POINT	C ALEU	5	5		0	0		0	
SEGUAM/WHARF POINT	C ALEU	5	90		121	49		69	
AGLIGADAK	C ALEU	5	61		15	14	11	38	
AMLIA/EAST CAPE	C ALEU	5	34		55	117		63	
AMLIA/SVIECH. HARBOR	C ALEU	5	144		113	100	192	120	
TANADAK (AMLIA)	C ALEU	5	1		0	30		12	
SAGIGIK	C ALEU	5	30		10	14		40	
ATKA/NORTH CAPE	C ALEU	4	383	279	140	32		206	
ATKA/CAPE KOROVIN	C ALEU	4	4	0	30	39		6	
SALT	C ALEU	4	0		0	4		7	
KASATOCHI/NORTH POINT	C ALEU	4	667	610	613	550	609	732	
OGLODAK	C ALEU	4	86	111	58	99	86	86	
IKIGINAK	C ALEU	4	0	8	16	0		0	

Table 2 (continued) SITE NAME	REGION	RCA	2004	2006	2007	2008	2009	2010E	2010L
FENIMORE	C ALEU	4	30	10	9	4		29	
ANAGAKSIK	C ALEU	4	2	52	14	20		30	
GREAT SITKIN	C ALEU	4	0	0	0	0		0	
LITTLE TANAGA STRAIT	C ALEU	4	49		15	36		26	
KAGALASKA	C ALEU	4	48	0	3	42		52	
ADAK	C ALEU	4	1,008		779	621	596	715	
KANAGA/N CAPE	C ALEU	3	7	13	2	14		0	
KANAGA/CAPE MIGA	C ALEU	3	0	0	0	0		27	
KANAGA/SHIP ROCK	C ALEU	3	229		331	322	420	372	
TANAGA/BUMPY POINT	C ALEU	3	33		33	22		46	
TANAGA/CAPE SASMIK	C ALEU	3	122		63	95		96	
GRAMP ROCK	C ALEU	3	679			593	442	504	
UGIDAK	C ALEU	3	25			16		4	
TAG	C ALEU	3	242			255	235	212	
KAVALGA	C ALEU	3	56			63		4	
UNALGA+DINKUM ROCKS	C ALEU	3	19			0		0	
ULAK/HASGOX POINT	C ALEU	3	531			537	515	470	
AMATIGNAK/KNOB POINT	C ALEU	3	1		0	3		0	
AMATIGNAK/NITROF POINT	C ALEU	3	76	38		49		46	
SEMISOPOCHNOI/POCHNOI	C ALEU	2	55	41		32	36		
AMCHITKA/CAPE IVAKIN	C ALEU	2	0	0	0	0			
AMCHITKA/EAST CAPE	C ALEU	2	178	103		103	71		
AMCHITKA/ST. MAKARIUS	C ALEU	2	0	0	0	0			
AMCHITKA/COLUMN ROCK	C ALEU	2	85			71	69		
AYUGADAK	C ALEU	2	152			152	113		
RAT	C ALEU	2	45			0			
SEA LION ROCK (KISKA)	C ALEU	2	0			0			
TANADAK (KISKA)	C ALEU	2	34			1			
KISKA/SOBAKA-VEGA	C ALEU	2	101			52			
KISKA/CAPE ST STEPHEN	C ALEU	2	210			229	205		
KISKA/LIEF COVE	C ALEU	2	170			162	152		
KISKA/PILLAR ROCK	C ALEU	2	0			0			

Table 2 (continued) SITE NAME	REGION	RCA	2004	2006	2007	2008	2009	2010E	2010L
BULDIR	W ALEU	1	108			43		25	
SHEMYA	W ALEU	1	17	18		4			
ALCID	W ALEU	1	125	86		86		95	
AGATTU/CAPE SABAK	W ALEU	1	325	282		202		178	
AGATTU/GILLON POINT	W ALEU	1	374	308		281		237	
ATTU/MASSACRE BAY	W ALEU	1	0	0		0			
ATTU/CHIRIKOF POINT	W ALEU	1	75	30		42			
ATTU/CHICHAGOF POINT	W ALEU	1	54	13		25			
ATTU/KRESTA POINT	W ALEU	1	0	0		0			
ATTU/CAPE WRANGELL	W ALEU	1	257	260		247		190	
Western Trend Site Counts			27,437	19,058	23,144	28,185	24,329	19,256	5,514
Other Western Site Counts (Table 3)			1,600	2,231	3,012	3,060	1,125	1,439	540
SEAK Counts (Table 4)						14,344	16,986	15,776	10,803
Total Alaska Count			29,037	21,289	26,156	45,589	42,439	36,471	16,857

Table 3. Counts of adult and juvenile Steller sea lions at non-trend (other) sites, 2004-2010. 2010E refers to the non-pup survey conducted 7 June-3 July 2010; 2010L refers to the movement survey conducted 10-13 July 2010. All are aerial survey counts from high resolution, vertical photographs.

SITE NAME	REGION	RCA	2004	2006	2007	2008	2009	2010E	2010L
HOOK POINT	E GULF	10	96	101	132	261	0	384	0
STEEP POINT	E GULF	10	1	63	90	92	88	107	86
MIDDLETON	E GULF	10	4	0	0	0	0	0	0
POINT ELEANOR	E GULF	10		0	0	0	0	0	0
PERRY	E GULF	10		218	437	227	0	0	0
PLEIADES	E GULF	10		0	0	0	0	0	0
POINT LaTOUCHE	E GULF	10	0	0	0	0	0	0	0
DANGER	E GULF	10	12	10	119	2	1	0	160
PROCESSION ROCKS	E GULF	10	36	67	77	102	113	185	72
CAPE JUNKEN	E GULF	10	0	0	0	0	1	0	0
CAPE RESURRECTION	E GULF	10	3	0	12		169	0	158
GROTTO (NATOA) ISLAND	E GULF	10						46	63
GRANITE CAPE	E GULF	10	1	89	25	4	5	0	1
RABBIT	E GULF	10	0	0	0	0	0	0	0
FLAT	C GULF	10	4		44	0		0	0
SHAW	C GULF	9	81	162	1	0		0	
NUKA POINT	C GULF	10	0	0	0	0		0	0
PERL ROCKS	C GULF	10	0		0	0		0	0
WEST AMATULI	C GULF	9	0	0	0	0		0	
SUD	C GULF	9	0	0	0	0		0	
KODIAK/CAPE PARAMANOF	C GULF	9	0	0	0	0		0	
CAPE DOUGLAS	C GULF	9	0	0	0	0		0	
KODIAK/MALINA POINT	C GULF	9	0	0	0	0		0	
NOISY	C GULF	9	0	0	0	0		0	
KODIAK/CAPE KULIUK	C GULF	9	0	0	0	0		0	
KODIAK/BIRD ROCK	C GULF	9						108	
CAPE NUKSHAK	C GULF	9	0	0	0	0		0	

Table 3 (continued) SITE NAME	REGION	RCA	2004	2006	2007	2008	2009	2010E	2010L
CAPE UGYAK	C GULF	8	0	0	0	0		0	
KODIAK/SUNDSTROM	C GULF	8	0		0	0		0	
CAPE GULL	C GULF	8	0	0	0	0		0	
CAPE KULIAK	C GULF	8		0	4	0		0	
KODIAK/CAPE ALITAK	C GULF	8	0		0	0		0	
KODIAK/CAPE UYAK	C GULF	8		0	0	0		0	
KODIAK/STURGEON HEAD	C GULF	8		0	0	0		0	
KODIAK/CAPE IKOLIK	C GULF	8	108	52	33	57		86	
KODIAK/TOMBSTONE ROCKS	C GULF	8	0	0	0	0		0	
KILOKAK ROCKS	C GULF	8	85	144	198	101		142	
AIUGNAK COLUMNS	C GULF	8	1	24	7	3			
AGHIYUK	C GULF	8	27	5	9	0		0	
OLGA ROCKS NE	W GULF	7	11	28	36	48			
OLGA ROCKS SW	W GULF	7	117	102	95	128			
SUSHILNOI ROCKS	W GULF	7	290	327	289	286	398		
CATON	W GULF	7	109	368	416	542			
ATKULIK	W GULF	8	0	0		0		0	
CHANKLIUT	W GULF	8	0	0		0		0	
SEAL CAPE	W GULF	8	0	0		0			
BIG KONIUJI	W GULF	7	0	0	0	0			
TWINS	W GULF	7	0	0	0	0			
NAGAI/RK W OF CAPE WEDGE	W GULF	7	0	0	0	0			
EGG (SAND POINT)	W GULF	7	0	0	0	0			
UNGA/CAPE UNGA	W GULF	7	0	0	0	0			
OMEGA	W GULF	7	0	1	0	0			
WOSNESENSKI	W GULF	7	166	113	110	98			
HUNT	W GULF	7	0	0	0	0			
HAGUE ROCK	W GULF	7	0	0	0	1			
SOZAVARIKA	W GULF	7	0	0		0			
SANAK	W GULF	7	0	0	0	0			
UMGA	W GULF	7	0	0	0	0			

Table 3 (continued) SITE NAME	REGION	RCA	2004	2006	2007	2008	2009	2010E	2010L
UNIMAK/CAPE LAZAREF	E ALEU	7	0		0	0			
UNIMAK/OKSENOF POINT	E ALEU	6			269	762	332		
UNIMAK/CAPE LUTKE	E ALEU	7	0	0	0	0			
UNIMAK/SCOTCH CAP	E ALEU	6	0	0	0	0			
Rock b/n Unimak/Sennett Point and Unimak/Cape Sarichef	E ALEU	6		19	6	0			
KALIGAGAN	E ALEU	6	1	0	6	1			
UNIMAK/SENNETT POINT	E ALEU	6	0	1	0	0			
BASALT ROCK	E ALEU	6	1	4	0	0			
AKUN/AKUN BAY	E ALEU	6	0	0	18	8			
AKUN/JACKASS POINT	E ALEU	6	0	0	0	0			
AKUN/AKUN HEAD	E ALEU	6	0	0	0	0			0
AKUTAN/BATTERY POINT	E ALEU	6	0	0	0	0			0
AVATANAK	E ALEU	6		15	42	0			
BABY	E ALEU	6	0	4	0	0			0
INNER SIGNAL	E ALEU	6	38	0	47	54			28
UNALASKA/PRIEST ROCK	E ALEU	6	0	1	3	2			4
UNALASKA/WHALEBONE CAPE	E ALEU	6	0	0	0	0			0
UNALASKA/CAPE WISLOW	E ALEU	6	0	0	0	0			0
UNALASKA/CAPE STARICHKOF	E ALEU	6	0	0	0	0			0
UNALASKA/KOVRIZHKA	E ALEU	6	0	0	0	0			0
UMNAK/CAPE IDAK	E ALEU	6		0	0	0			0
EMERALD	E ALEU	6	0		0	0			0
UMNAK/REINDEER POINT	E ALEU	6		0		0			
UMNAK/CAPE CHAGAK	E ALEU	6		0		0			
UMNAK/AGULIUK POINT	E ALEU	6		0		0			0
SAMALGA	E ALEU	6	1	0	0	0			0
TAGALAK	C ALEU	4	91	134	162	86			53
SILAK	C ALEU	4	38	32	88	32			90
ADAK/CAPE MOFFET	C ALEU	4	0	0	0	0			0
ADAK/ARGONNE POINT	C ALEU	4	35	12	10	0			84
BOBROF	C ALEU	3	49	21		0			19

Table 3 (continued) SITE NAME	REGION	RCA	2004	2006	2007	2008	2009	2010E	2010L
SEMISOPOCHNOI/PETREL	C ALEU	2	0	43		0			
SEMISOPOCHNOI/SW KNOB	C ALEU	2	17	0		0			
SEMISOPOCHNOI/TUMAN POINT	C ALEU	2	0	0		0			
SEGULA/GULA POINT	C ALEU	2		1		0			
AMLIA/CAPE MISTY	C ALEU	5	21		72	0		0	
KONIUJI/NORTH POINT	C ALEU	4	0	0	0	0		0	
CHUGUL	C ALEU	4	39	69	73	12		33	
IGITKIN/SW POINT	C ALEU	4	0	0	0	0		0	
ADAK/CRONE ISLAND	C ALEU	4	0			60		15	
KANAGA/CAPE CHUNU	C ALEU	3	9		82	69	18	21	
ILAK	C ALEU	3	45			18		32	
SKAGUL/S. POINT	C ALEU	3	1			1			
OGLIUGA	C ALEU	3	49			0		2	
AMCHITKA/OMEGA POINT	C ALEU	2	0	0	0	0			
AMCHITKA/CHITKA POINT	C ALEU	2	0		0	0			
AMCHITKA/BIRD	C ALEU	2	0		0	0			
TWIN ROCKS (KISKA)	C ALEU	2	13			1			
KISKA/SOUTH HEAD	C ALEU	2	0	0		0			
KISKA/WITCHCRAFT POINT	C ALEU	2	0			7			
KISKA/GERTRUDE-BUKHTI	C ALEU	2	0	0		0			
INGENSTREM ROCKS	W ALEU	1	0	1		0			
NIZKI	W ALEU	1	0	0		0			
DAN'S ROCKS	W ALEU	1	0	0		0			
TOTAL OTHER WESTERN SITES			1,600	2,231	3,012	3,060	1,125	1,439	540

Table 4. Counts of adult and juvenile Steller sea lions at rookery (in bold) and haulout trend (1) and other sites in southeast Alaska (SEAK = RCA 11), 2002-2010. 2010E refers to the non-pup survey conducted 7 June-3 July 2010; 2010L refers to the movement survey conducted 10-13 July 2010. All are counts from aerial surveys using high-resolution, vertical photographs. For 2010L survey, X means site was skipped because of low recent counts and W refers to a site missed due to bad weather.

SITE NAME	TREND	2002	2008	2009	2010E	2010L
LITTLE ISLAND			0	0	0	X
POINT MARSH		104	4	0	2	61
WEST ROCK		640	841	869	700	375
WOLF ROCK		207	300	170	245	3
SAKIE POINT			0	0	0	X
CAPE BARTOLOME		41	0	0	59	13
CAPE ADDINGTON		1,074	718	9	542	616
GRINDALL		130	374	6	132	90
TIMBERED		442	288	4	444	438
HAZY	1	2,050	1,686	2,457	1,642	1,570
EASTERLY			255	189	216	124
CORONATION	1	46	279	5	254	178
South of Cape Ommaney			102	113	125	86
CAPE OMMANEY		344	117	161	192	138
LARCH BAY			28	0	0	0
SEA LION ROCK (PUFFIN BAY)		264	0	124	113	16
ETOLIN			0	0	0	X
PATTERSON POINT			0		0	X
BIALI ROCK	1	626	408	616	488	509
FORRESTER COMPLEX	1	3,699	2,894	4,742	3,385	3,152
JACOB ROCK	1	203	101	300	220	138
KAIUCHALI (BIORKA)		46	31	5	18	26
EMMONS					0	X
HORN CLIFF			0	0	0	X
YASHA		920	379	612	450	1,516
ST. LAZARIA			0	0	0	X
PINTA ROCKS			0	0	0	X

Table 4 (continued) SITE NAME	TREND	2002	2008	2009	2010E	2010L
TURNABOUT			0	0	0	0
ROUND ROCK			0	0	0	X
THE BROTHERS	1	981	765	537	828	608
SEA LION ISLANDS			137	298	271	W
POINT LULL			153	162	0	0
SAIL		0	3	496	0	980
FALSE POINT PYBUS		0	0	0	0	X
SUNSET		348	384	323	400	0
POINT LEAGUE (STEVENS PASSAGE)		0	1	0	0	0
WHITE SISTERS	1	1,156	1,132	1,435	1,557	W
TENAKEE CANNERY POINT			0	0	0	X
CAPE CROSS	1	1	1	0	7	0
TARR INLET					0	X
MIST			0	0	0	X
POINT MARSDEN			0	0	0	X
CAPE BINGHAM		0	0	0	0	X
CIRCLE POINT			0	0	0	X
THE SISTERS			0	0	0	X
DOROTHY			0	0	0	X
GRAVES ROCK	1	1,001	1,305	1,442	1,057	W
INIAN		206	116	2	175	W
POINT ISLET (POINT ROCK)					0	X
VENISA		0	0	0	0	X
POINT CAROLUS		0	0	0	0	X
BENJAMIN		0	0	0	0	X
HARBOR POINT	1	186	178	264	206	0
SOUTH MARBLE		238	786	1,010	1,458	W
MIDDLE PASS ROCK					74	W
CASE (TLINGIT) POINT			0	0	0	X
CAPE FAIRWEATHER	1		0	0	0	0
MET POINT			0	0	0	X
ELDRED ROCK			0	0	0	X

Table 4 (continued) SITE NAME	TREND	2002	2008	2009	2010E	2010L
GRAN (LEDGE) POINT		331	583	638	516	166
Total SEAK Trend-Sites		9,949	8,748	11,798	9,644	6,155
Total SEAK Other Sites		5,335	5,597	5,188	6,132	4,648
Total SEAK		15,284	14,344	16,986	15,776	10,803

Table 5. Counts of Steller sea lion pups at rookeries (in bold) in Alaska in late June-July, 1990-2010. Pup counts at haulouts in 2010 are also shown, as are counts for pooled years (1990-92, 2001-02, and 2003-04). Counts from both observers on the ground and from high-resolution, vertical aerial photographs are included.

SITE NAME	Region	RCA	1990-92	1994	1997	1998	2001-02	2003-04	2005	2009	2010
FORRESTER COMPLEX	SEAK	11	3,261	2,757	2,798	2,753	3,152		3,429	4,036	2,673
HAZY	SEAK	11	808	862	1,157	1,199	1,257		1,286	1,976	1,357
WHITE SISTERS	SEAK	11	95	151	205	282	403		520	847	
GRAVES ROCK	SEAK	11				1	98		175	441	
BIALI ROCK	SEAK	11					59		100	144	85
YASHA	SEAK	11									9
CAPE ADDINGTON	SEAK	11									1
TIMBERED	SEAK	11									1
SEAL ROCKS	E GULF	10	657	598	491	542	500	543	556	740	634
WOODED (FISH)	E GULF	10		305	120	147	86	173	159	178	224
CHISWELL	E GULF	10					54		44	64	64
THE NEEDLE	E GULF	10									22
CAPE ST. ELIAS	E GULF	10									15
POINT ELRINGTON	E GULF	10									4
OUTER (PYE)	C GULF	10	363	119	104	113	104	59	104	122	122
SUGARLOAF	C GULF	9	1,683	958	673	703	490	488	559	613	
USHAGAT	C GULF	9					42	43	55	71	
MARMOT	C GULF	9	1,611	804	762	642	515	505	433	509	
CHOWIET	C GULF	8	636	625		234	387	368	432	360	
CHIRIKOF	C GULF	8	656	325		184	225	189	123	216	
ATKINS	W GULF	7	485	324	366	352	274	266	328	338	
CHERNABURA	W GULF	7	211	139		54	138	82	153	244	
JUDE	W GULF	7					182	187	206	270	
PINNACLE ROCK	W GULF	7	794	652		639	769	663	643	702	
CLUBBING ROCKS	W GULF	7	433	547		448	490	566	583	778	

Table 5 (continued) SITE NAME	Region	RCA	1990-92	1994	1997	1998	2001-02	2003-04	2005	2009	2010
SOUTH ROCKS	W GULF	7					36		44	60	
SEA LION ROCK (AMAK)	E ALEU	6				134	161	185	158	185	
UGAMAK COMPLEX	E ALEU	6	847	574	589	558	570	686	769	909	
AKUN/BILLINGSHEAD	E ALEU	6	63	69		56	55	85		144	
AKUTAN/CAPE MORGAN	E ALEU	6	442	631		505	508	497	657	688	730
BOGOSLOF	E ALEU	6	501	302	281	220	256	278	225	282	
OGCHUL	E ALEU	6		94		42	57	69	78	90	116
ADUGAK	E ALEU	6	262	180		135	172	185	185	276	
UNALASKA/CAPE IZIGAN	E ALEU	6									41
THE PILLARS	E ALEU	6									1
YUNASKA	C ALEU	5	230	217	192	161	145	145		170	185
SEGUAM/SADDLERIDGE	C ALEU	5	684	444	463	479	468	517	530	540	518
AGLIGADAK	C ALEU	5				0		2	0	0	1
AMLIA/SVIECH. HARBOR	C ALEU	5				13	22	28	28	34	30
AMLIA/EAST CAPE	C ALEU	5									2
KASATOCHI/NORTH POINT	C ALEU	4	178	215	268	247	302	354	372	394	354
ADAK	C ALEU	4	137	327		340	395		311	338	320
KANAGA/SHIP ROCK	C ALEU	4					113		221	214	214
KANAGA/CAPE CHUNU	C ALEU	4									3
TANAGA/CAPE SASMIK	C ALEU	4									3
OGLODAK	C ALEU	4									3
SILAK	C ALEU	4									1
TAGALAK	C ALEU	4									1
GRAMP ROCK	C ALEU	3	448	425		456	444	439	387	332	299
TAG	C ALEU	3	357	234		238	155	150	144	130	135
ULAK/HASGOX POINT	C ALEU	3	790	638		521	332	257	338	272	264
AMCHITKA/COLUMN ROCKS	C ALEU	2	148	114		70	52	45	44	40	
AYUGADAK	C ALEU	2	163	142		89	90	66	83	44	
KISKA/LIEF COVE	C ALEU	2	221	233		179	158	101	115	80	
KISKA/CAPE ST STEPHEN	C ALEU	2	212	120		54	71	75	82	91	

Table 5 (continued) SITE NAME	Region	RCA	1990-92	1994	1997	1998	2001-02	2003-04	2005	2008	2010
BULDIR	W ALEU	1	381	120	120	122	42		26	7	1
AL Aid	W ALEU	1							27	20	10
AGATTU/CAPE SABAK	W ALEU	1	1,127		379	314	212	159	113	83	84
AGATTU/GILLON POINT	W ALEU	1			258	213	159	174	157	142	106
ATTU/CAPE WRANGELL	W ALEU	1			222	154	75	47	47		33
WALRUS	BERING		63	61	35		39		29		14

Table 6. Counts of Steller sea lion adults and juveniles (A) and pups (B) at trend sites in one region in the range of the eastern distinct population segment (DPS; southeast Alaska), and six regions in the western DPS in Alaska during June-July surveys from 1990 to 2010. Adult and juvenile counts in 2004-2010 have been adjusted to account for resolution and orientation differences with earlier counts. 2010E refers to the 7 June-3 July 2010 survey; 2010L refers to 10-13 July 2010 survey. Western Aleutian counts in 2009 include counts from both 2008 and 2005.

A. Adult and Juvenile Counts

Year	Eastern DPS	Western DPS in Alaska						Total
	in Alaska SEAK	Gulf of Alaska			Aleutian Islands			
		Eastern	Central	Western	Eastern	Central	Western	
1991	8,034	4,812	7,872	5,338	5,283	8,656	4,601	36,562
1992	8,014	3,981	7,358	5,112	5,707	7,633	4,199	33,991
1994	9,001	3,612	6,505	5,718	5,664	6,909	3,114	31,522
1996	8,230	2,450	5,400	5,356	5,967	6,368	3,334	28,875
1998	8,693	2,158	4,806	5,367	5,774	7,017	2,786	27,908
2000	9,855	2,102	4,555	3,996	4,990	6,560	1,633	23,836
2002	9,949	2,615	4,594	4,617	5,261	6,547	1,196	24,829
2004		3,015	4,028	5,233	5,991	6,885	1,286	26,438
2006		3,101			6,031			
2007		2,760						
2008	8,748	4,065	4,420	5,558	6,405	5,817	895	27,160
2009	11,798	3,501						
2010E	9,644	3,204	4,333					
2010L		4,823						

B. Pup Counts

1990-1992	4,164		4,904	1,923	2,115	3,568		
1994	3,770	903	2,831	1,662	1,756	3,109		
1997		611					979	
1998	4,235	689	1,876	1,493	1,474	2,834	803	9,169
2001-2002	4,877	586	1,721	1,671	1,561	2,612	488	8,639
2003-2004		716	1,609	1,577	1,731			
2005	5,510	715	1,651	1,707	1,921	2,551	343	8,888
2009	7,444	918	1,821	2,062	2,300	2,436	279	9,816
2010		858					224	

Figure 1. Terrestrial rookery and haulout sites in the range of the eastern and western distinct population segments (=stocks) of Steller sea lions in Alaska surveyed in 2010 and used in the analysis of population trends. The eastern and western stocks breed on rookeries east and west of 144°W, respectively. Boundaries of the eastern, central, and western regions of the Gulf of Alaska and Aleutian Islands are thick, solid lines. Boundaries of rookery cluster areas (RCAs 1-11) are dashed lines.

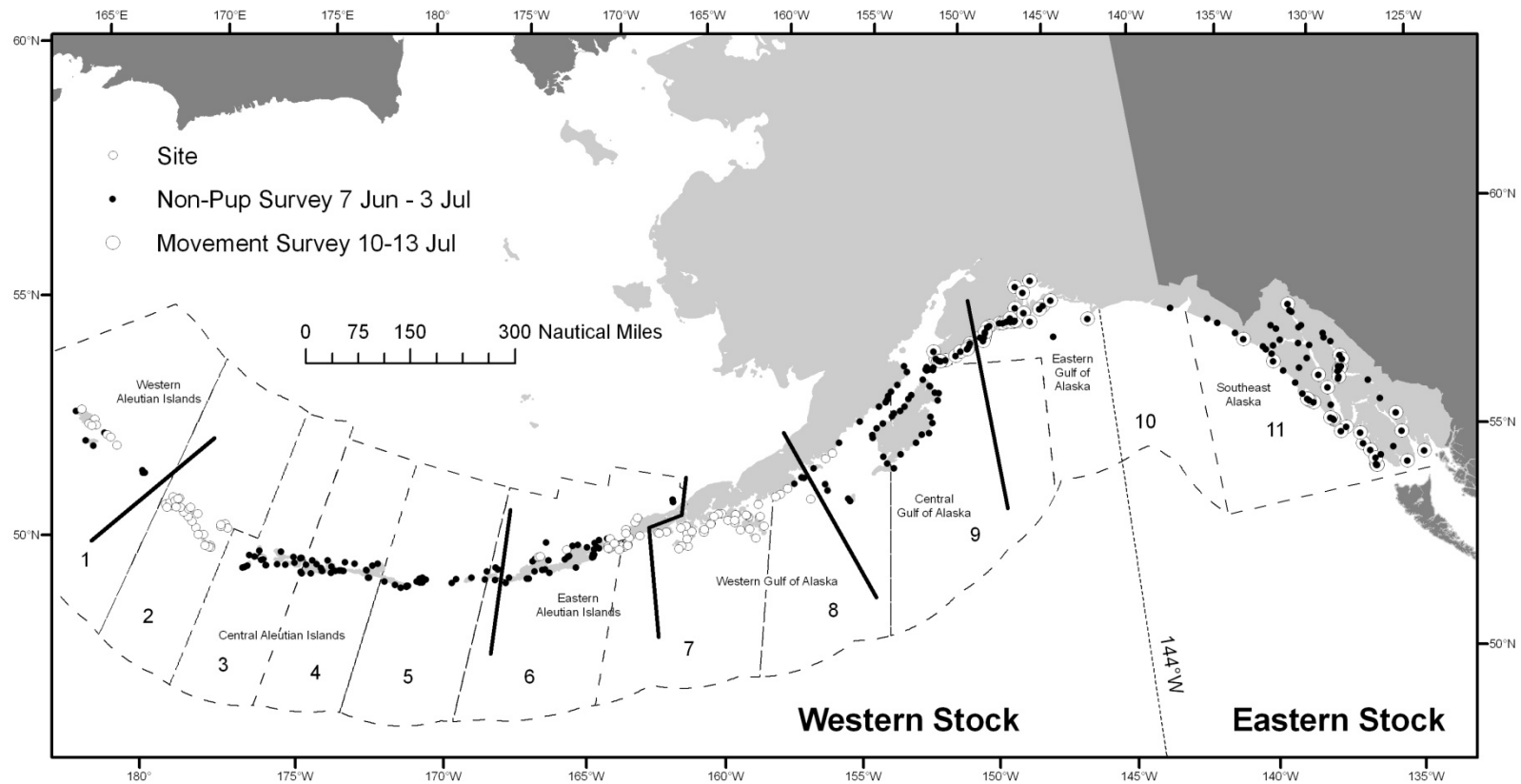


Figure 2. Counts of adult and juvenile Steller sea lions, 1990-2010, at trend sites in RCAs 1-3 (A), RCAs 4-5 (B), RCAs 6-7 (C), and RCAs 8-9 (D). RCA 1 is the same as the W ALEU and RCAs 2-5 are the same as the C ALEU. RCA 6 is equivalent to the E ALEU and was divided into western (Samalga Pass through Unalaska Island including rookeries on Adugak, Ogchul, and Bogoslof Islands), central (Krentizen Islands including rookeries on Akun, Akutan and Ugamak Islands), and Bering (Unimak and Amak Islands including the rookery on Sea Lion Rock) portions. RCA 7 is equivalent to the W GULF, and RCAs 8-9 are equivalent to the C GULF. Trend site totals in 2004-2010 were adjusted to account for differences in film resolution and orientation relative to earlier counts in the time series (Fritz and Stinchcomb 2005).

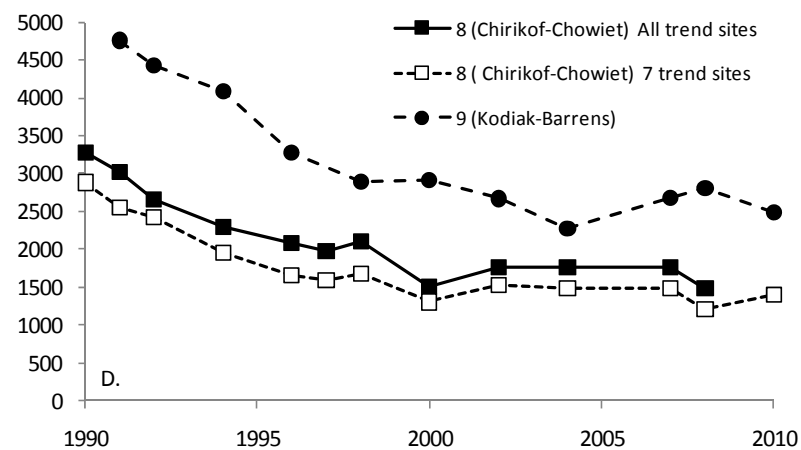
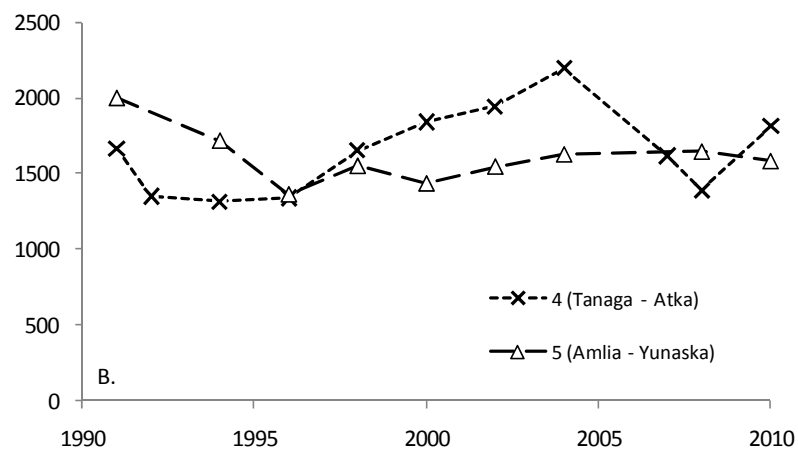
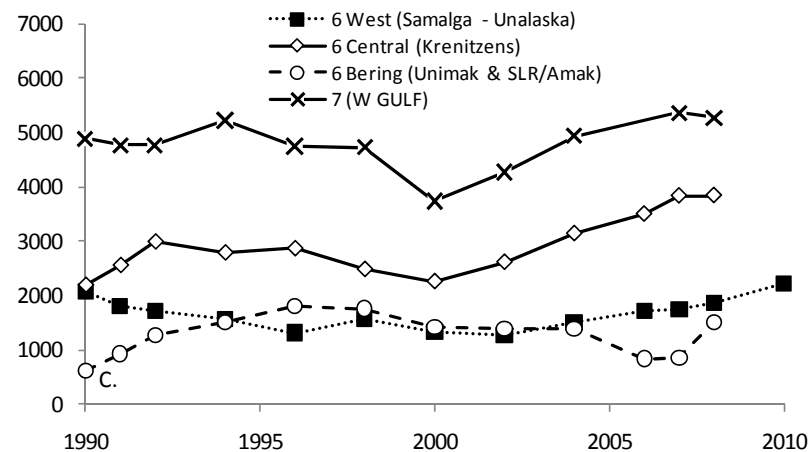
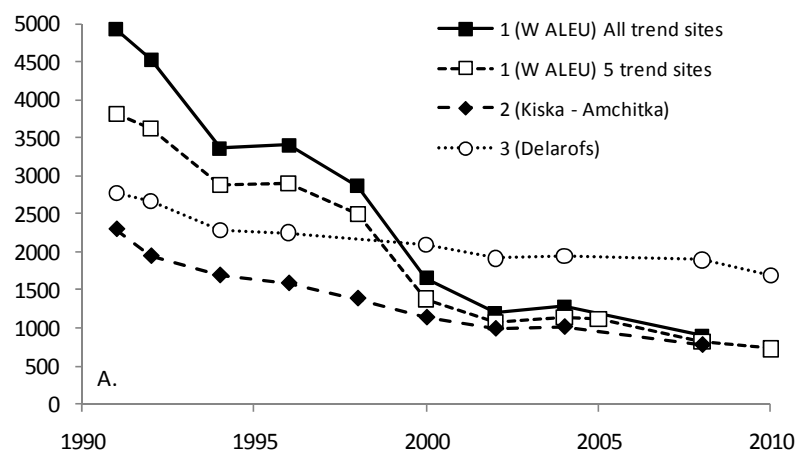


Figure 3. Counts of adult and juvenile Steller sea lions, 1990-2010, at trend sites in RCA 10 (A) and RCA 11 (B). RCA 10 is similar to the E GULF, and RCA 11 is equivalent to SEAK. In A, RCA 10 trend site totals for both the early non-pup and late movement surveys in 2010 are shown. In B, 3 different RCA 11 trend site totals are shown: 1) all trend sites using the early 2010 non-pup survey, 2) all trend sites but not including White Sisters and Graves which were missed in the late 2010 movement survey, and using the early 2010 counts, and 3) all trend sites but not including White Sisters and Graves and using the late 2010 counts. Trend site totals in 2004-2010 were adjusted to account for film resolution and orientation relative to earlier counts in the time series (Fritz and Stinchcomb 2005).

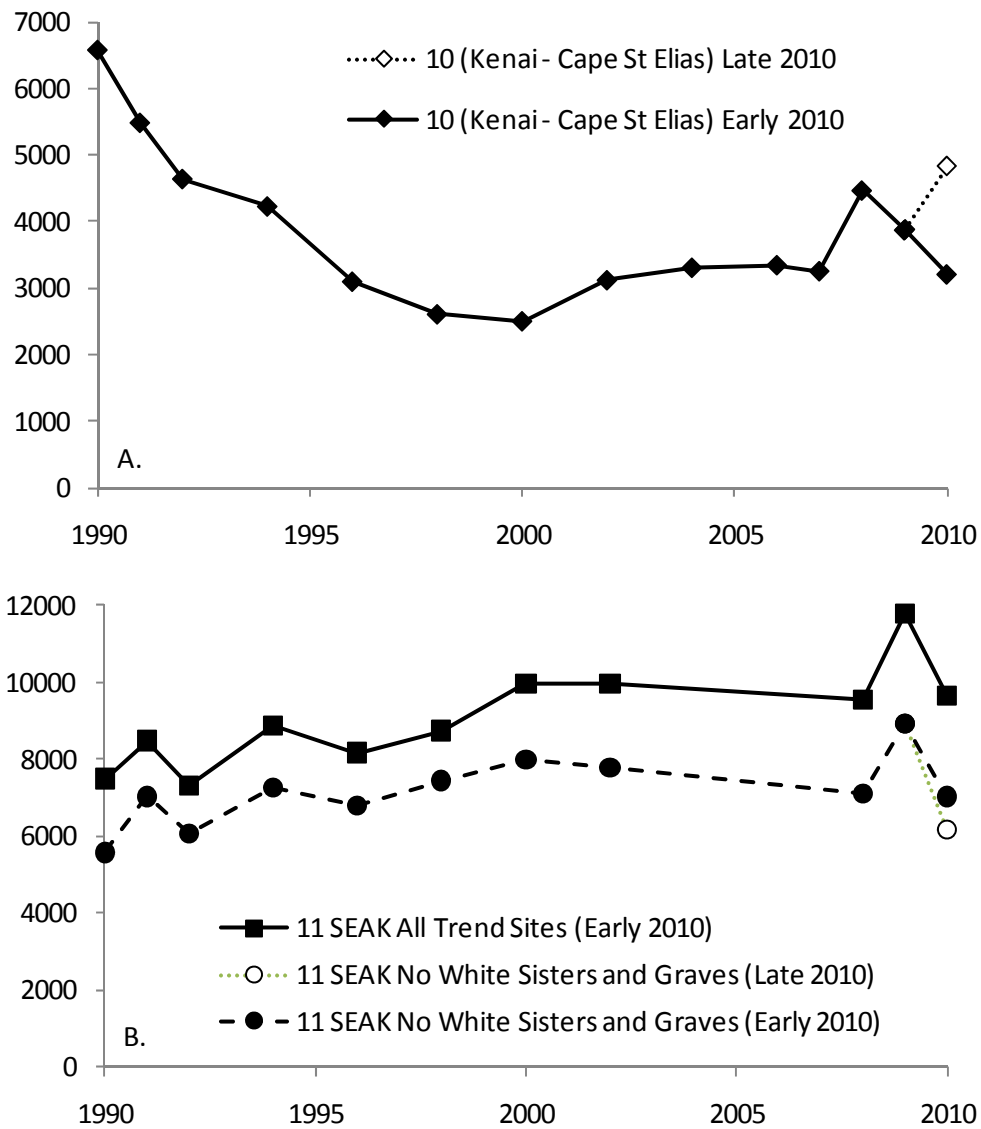


Figure 4. Counts of Steller sea lion pups, 1990-2010, at rookeries in RCAs 1-3 (A), RCAs 4-5 (B), RCAs 6-7 (C), RCAs 8-9 (D), RCA 10 (E), and RCA 11 (F). RCA 1 is the same as the W ALEU and RCAs 2-5 are the same as the C ALEU. RCAs 6 and 7 are equivalent to the E ALEU and W GULF, respectively, while RCAs 8-9 are equivalent to the C GULF. RCAs 10 and 11 are equivalent to the E GULF and SEAK, respectively.

