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Memorandum For: James Balsiger, Director, Alaska Region  
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Resources

From: Douglas DeMaster, Director, Alaska Fisheries Science Center

Subject: Results of Steller Sea Lion Surveys in Alaska, June-July 2013

Aerial and ship-based surveys to count Steller sea lion (*Eumetopias jubatus*) pups and non-pups (adults and juveniles) on land in Alaska were conducted by the National Marine Mammal Laboratory in June-July 2013. The aerial photographic survey was conducted from 22 June to 9 July, and targeted all known haulout and rookery sites in the eastern distinct population segment (DPS) in southeast Alaska from Dixon Entrance to 144°W as well as the eastern portion of the western DPS from 144-163°W. Ship-based survey effort was conducted from 21 June to 8 July at selected sites in the Aleutian Islands between 165°W and 172°E.

### Methods

Aerial surveys to count Steller sea lions are conducted in late June through mid-July starting at least 10 days after the mean birth dates of pups in the survey area (4-14 June; Pitcher et al. 2001). The primary objective in 2013 was to survey all terrestrial rookery and haul-out sites from southeast Alaska (eastern DPS) into the western DPS from the eastern Gulf of Alaska to the western Gulf of Alaska (Figure 1). A NOAA twin Otter aircraft equipped with three high resolution digital cameras was used as in 2009-2012 (Fritz et al. 2013). In 2013, 178 of the 196 targeted sites were successfully surveyed: 65 of 66 sites in southeast Alaska (one site missed due to fog), all 89 sites in the eastern and central Gulf of Alaska, and 24 of 41 sites in the western Gulf of Alaska. In the western Gulf, 6 sites were avoided due to close proximity (within 50 nm) to the active volcano at Mt. Veniaminof and 11 sites with recent histories of no sea lion presence during the summer breeding season were skipped due to restricted flight hours. The rookery at Atkins Island in the western Gulf of Alaska was only partially surveyed in 2013, with the cobble beach area missed. Counts of sea lions on the cobble beach area from 2011 (116 pup and 245 non-pups) were added to the 2013 count to yield a total Atkins estimate that was used in the trend analyses. Aerial photographs were analyzed as in previous years (see Fritz et al. 2013). Two researchers conducted aerial survey counts and means are reported. Ship-based surveys utilized the USFWS RV *Tiglâx*, and consisted of direct counts (means of 2-3 observers reported) from land-based overlooks, skiffs or the research vessel at 28 sites (Figure 2). Trends in pup and non-pup counts were estimated using agTrend (Fritz et al. 2013; Johnson and Fritz in review) which utilizes data from all sites with at least two non-zero counts between 1990 and 2012.

## Results and Discussion

### *Pups*

In 2013, we counted a total of 13,412 live pups on 55 sites (27 rookeries and 28 haul-outs) that had at least one pup; 6,741 in southeast Alaska (eastern DPS) and 6,671 in the portion of the western DPS that was surveyed (Tables 1 and 2). The southeast Alaska pup count in 2013 was 10% lower than in 2009 despite similar survey dates (24-25 June 2009 and 22-24 June 2013).

Within the western DPS, complete pup surveys were conducted in the eastern (N=1,236) and central Gulf of Alaska (N=2,554), as well as the western Aleutian Islands (N=203). In the western Gulf of Alaska, we counted a total of 2,624 live pups in 2013, but we missed a portion of the Atkins rookery. If the 116 pups counted in 2011 on the portion missed in 2013 are included, we estimate a total western Gulf of Alaska pup count of 2,740 for 2013, an increase of 2% from 2011 (Fritz et al. 2013). A total of only 2 pups were counted in 2011 on the 6 western Gulf sites skipped in 2013 due to the volcanic eruption; thus, the 2013 western Gulf of Alaska pup count estimate of 2,740 is also considered complete.

Updated trends in pup counts using agTrend (Johnson and Fritz, in review) for each region and the western DPS as a whole are listed in Table 3 and shown in Figure 3. Pup counts increased at 1.75%  $y^{-1}$  in the western DPS overall between 2000 and 2013, up slightly but not significantly different from the 1.45%  $y^{-1}$  estimated for the 2000-2012 period (Fritz et al. 2013). Trends were different east and west of Samalga Pass: to the east, pup counts increased at  $>3\%$   $y^{-1}$ , while to the west, counts decreased at  $-1.5\%$   $y^{-1}$  with continued steep decline in the western Aleutian Islands ( $-8.9\%$   $y^{-1}$ ). The agTrend estimate for the total pup count in the western DPS in Alaska is 12,316 (95% credible interval of 11,741 - 12,926).

### *Non-pup survey results*

In 2013, we counted a total of 40,349 live non-pups on 119 sites (28 rookeries and 91 haul-outs) that had at least one non-pup; 19,101 in southeast Alaska (eastern DPS) and 21,248 in the portion of the western DPS that was surveyed (Tables 1 and 2). The southeast Alaska non-pup count in 2013 was 12% greater than in 2009 and had similar survey dates (24-25 June 2009 and 22-24 June 2013).

Within the western DPS, complete non-pup surveys were conducted in the eastern (N=5,491) and central Gulf of Alaska (N=7,164). In the western Gulf of Alaska, we counted a total of 7,658 non-pups in 2013, but we missed a portion of the Atkins rookery (245 non-pups in 2011) plus 6 other sites that had a combined total of 359 non-pups in 2011. If the non-pups counted in 2011 at the sites missed in 2013 are included, this yields a total western Gulf of Alaska non-pup count of 8,262 for 2013, virtually identical to the 8,261 counted in 2011 (Fritz et al. 2013).

Updated trends in non-pup counts using agTrend (Johnson and Fritz, in review) for each region and the western DPS as a whole are listed in Table 3 and shown in Figure 4. Non-pup counts increased at 1.87%  $y^{-1}$  in the western DPS overall between 2000 and 2013, up slightly but not significantly different from the 1.67%  $y^{-1}$  estimated for the 2000-2012 period (Fritz et al. 2013). Trends were different east and west of Samalga Pass: to the east, non-pup counts increased at  $>3\%$   $y^{-1}$ , while to the west, counts decreased at  $-1.3\%$   $y^{-1}$  with continued steep decline in the western Aleutian Islands ( $-7.2\%$   $y^{-1}$ ). The agTrend estimate for the total non-pup count in the western DPS in Alaska is 36,360 (34,469 - 38,271).

## Acknowledgments

AFSC thanks David Cowan, Michael Marino, Robert Mitchell, Ron Pauley and the entire NOAA Aircraft Operations Center for their continuing efforts to conduct the aerial survey, and the captain and crew of the USFWS RV *Tiglâx* for their continued support of our Aleutian Steller sea lion research program. Each year's surveys present a unique set of logistical, mechanical and weather-related challenges, and because of their dedication, we are able to squeeze in as much survey time as possible. AFSC also greatly appreciates the commitment of Morgan Lynn, Jim Gilpatrick and Wayne Perryman, SWFSC, and Don LeRoi (Aerial Imaging Solutions, Old Lyme, CN) toward making the aerial survey possible, and Bureau of Land Management (DOI) for being our 'eye in the sky'. The entire aerial survey crew also acknowledges and greatly appreciates the support provided by the US Coast Guard Kodiak and Sitka, Peninsula Airways in Sand Point, and the Federal Aviation Administration Anchorage. Lowell Fritz, Kathryn Sweeney (AFSC-NMML), and Morgan Lynn (SWFSC) conducted the survey and LF and KS analyzed all photographs. Devin Johnson (AFSC-NMML) conducted all trend analyses.

## Literature Cited

- Fritz, L. W., K. Sweeney, D. Johnson, M. Lynn, T. Gelatt, and J. Gilpatrick. 2013. Aerial and ship-based surveys of Steller sea lions (*Eumetopias jubatus*) conducted in Alaska in June-July 2008 through 2012, and an update on the status and trend of the western Distinct Population Segment in Alaska. U.S. Dep. Commer., NOAA Tech. Memo. NMFS-AFSC-251, 91 p.
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- Pitcher, K. W., V. N. Burkanov, D. G. Calkins, B. J. LeBoeuf, E. G. Mamaev, R. L. Merrick, and G. W. Pendleton. 2001. Spatial and temporal variation in the timing of births of Steller sea lions. *J. Mammalogy* 82(4): 1047-1053.

Table 1. Counts of Steller sea lion pups (live) and non-pups from sites surveyed in 2013. See footnotes for information on the estimation of sea lions on Atkins rookery (W GULF). See Figure 1 for Region and RCA (rookery cluster area) locations.

SITENAME	REGION	RCA	ROOKERY	DATE	PUP	NON-PUP
BENJAMIN	SE AK	11	0	23-Jun	0	100
BIALI ROCK	SE AK	11	1	23-Jun	185	832
BLACK ROCK	SE AK	11	0	24-Jun	0	0
CAPE ADDINGTON	SE AK	11	0	23-Jun	3	1006
CAPE BARTOLOME	SE AK	11	0	23-Jun	0	214
CAPE BINGHAM	SE AK	11	0	24-Jun	0	0
CAPE CROSS	SE AK	11	0	24-Jun	0	0
CAPE FAIRWEATHER	SE AK	11	0	25-Jun	0	0
CAPE OMMANEY	SE AK	11	0	22-Jun	2	502
CASE (TLINGIT) POINT	SE AK	11	0	24-Jun	0	0
CIRCLE POINT	SE AK	11	0	23-Jun	0	0
CORONATION	SE AK	11	0	22-Jun	0	7
DOROTHY	SE AK	11	0	23-Jun	0	0
EASTERLY	SE AK	11	0	23-Jun	2	184
ELDRED ROCK	SE AK	11	0	23-Jun	0	0
EMMONS	SE AK	11	0	23-Jun	0	0
ETOLIN	SE AK	11	0	23-Jun	0	0
FALSE POINT PYBUS	SE AK	11	0	23-Jun	0	0
FORRESTER/C HORN RK	SE AK	11	1	23-Jun	268	438
FORRESTER/FORRESTER ISLAND	SE AK	11	1	23-Jun	0	42
FORRESTER/LOWRIE	SE AK	11	1	23-Jun	1870	2293
FORRESTER/NORTH RK	SE AK	11	1	23-Jun	577	923
FORRESTER/SEA LION RK	SE AK	11	1	23-Jun	499	648
GAFF ROCK	SE AK	11	0	24-Jun	0	0
GRAN (LEDGE) POINT	SE AK	11	0	23-Jun	0	361
GRAVES ROCK	SE AK	11	0	24-Jun	551	1358
GRINDALL	SE AK	11	0	23-Jun	0	350
HARBOR POINT	SE AK	11	0	25-Jun	0	0
HAZY	SE AK	11	1	22-Jun	1837	2450
HORN CLIFF	SE AK	11	0	23-Jun	0	0
INIAN	SE AK	11	0	24-Jun	0	10
JACOB ROCK	SE AK	11	0	23-Jun	0	314
KAIUCHALI (BIORKA)	SE AK	11	0	23-Jun	0	22
LARCH BAY	SE AK	11	0	22-Jun	0	0
LITTLE ISLAND	SE AK	11	0	23-Jun	0	0
MET POINT	SE AK	11	0	23-Jun	0	0
MIDDLE PASS ROCK	SE AK	11	0	24-Jun	0	490
MIST	SE AK	11	0	23-Jun	0	0
PATTERSON POINT	SE AK	11	0	23-Jun	0	0
PINTA ROCKS	SE AK	11	0	23-Jun	0	0
POINT CAROLUS	SE AK	11	0	24-Jun	0	0
POINT ISLET (POINT ROCK)	SE AK	11	0	23-Jun	0	0
POINT LEAGUE (STEVENS PASSAGE)	SE AK	11	0	23-Jun	0	0
POINT LULL	SE AK	11	0	23-Jun	0	0
POINT MARSDEN	SE AK	11	0	23-Jun	0	0

Table 1. (continued)

SITENAME	REGION	RCA	ROOKERY	DATE	PUP	NON-PUP
POINT MARSH	SE AK	11	0	23-Jun	0	8
ROUND ROCK	SE AK	11	0	23-Jun	0	0
SAIL	SE AK	11	0	23-Jun	0	416
SEA LION ISLANDS	SE AK	11	0	24-Jun	2	542
SEA LION ROCK (PUFFIN BAY)	SE AK	11	0	22-Jun	0	218
SOUTH MARBLE	SE AK	11	0	24-Jun	7	762
ST. LAZARIA	SE AK	11	0	24-Jun	0	0
SUNSET	SE AK	11	0	23-Jun	2	616
TARR INLET	SE AK	11	0	24-Jun	0	0
TENAKEE CANNERY POINT	SE AK	11	0	23-Jun	0	0
THE BROTHERS/SW	SE AK	11	0	23-Jun	0	515
THE BROTHERS/W+E	SE AK	11	0	23-Jun	0	0
THE SISTERS	SE AK	11	0	23-Jun	0	0
TIMBERED	SE AK	11	0	23-Jun	4	420
TURNABOUT	SE AK	11	0	23-Jun	0	0
VENISA	SE AK	11	0	24-Jun	0	0
WEST ROCK	SE AK	11	0	23-Jun	0	302
WHITE SISTERS	SE AK	11	1	24-Jun	924	1666
WOLF ROCK	SE AK	11	0	23-Jun	0	246
YASHA	SE AK	11	0	23-Jun	8	846
SITKAGI BLUFFS	E GULF	11	0	25-Jun	0	0
AIALIK CAPE	E GULF	10	0	25-Jun	0	164
AKWE	E GULF	10	0	25-Jun	0	0
ALSEK	E GULF	10	0	25-Jun	0	0
CAPE FAIRFIELD	E GULF	10	0	25-Jun	0	50
CAPE HINCHINBROOK	E GULF	10	0	25-Jun	0	270
CAPE JUNKEN	E GULF	10	0	25-Jun	0	0
CAPE PUGET	E GULF	10	0	25-Jun	0	0
CAPE RESURRECTION	E GULF	10	0	25-Jun	0	90
CAPE ST. ELIAS	E GULF	10	0	25-Jun	43	994
CHISWELL ISLANDS	E GULF	10	1	25-Jun	76	152
DANGER	E GULF	10	0	25-Jun	0	0
GLACIER	E GULF	10	0	25-Jun	6	962
GRANITE CAPE	E GULF	10	0	25-Jun	0	51
HOOK POINT	E GULF	10	0	25-Jun	0	9
MIDDLETON	E GULF	10	0	25-Jun	0	0
NATOA (GROTTO)	E GULF	10	0	25-Jun	1	52
PERRY	E GULF	10	0	25-Jun	0	0
PLEIADES	E GULF	10	0	25-Jun	0	0
POINT ELEANOR	E GULF	10	0	25-Jun	0	0
POINT ELRINGTON	E GULF	10	0	25-Jun	1	98
POINT LaTOUCHE	E GULF	10	0	25-Jun	0	0
PROCESSION ROCKS	E GULF	10	0	25-Jun	2	125
RABBIT	E GULF	10	0	25-Jun	0	0
RAGGED/HOOF POINT	E GULF	10	0	25-Jun	0	71
RUGGED	E GULF	10	0	25-Jun	0	3
SEAL ROCKS	E GULF	10	1	25-Jun	802	1445

Table 1. (continued)

SITENAME	REGION	RCA	ROOKERY	DATE	PUP	NON-PUP
SEAL ROCKS (KENAI)	E GULF	10	0	25-Jun	0	7
STEEP POINT	E GULF	10	0	25-Jun	0	1
THE NEEDLE	E GULF	10	0	25-Jun	29	84
WOODED (FISH)	E GULF	10	1	25-Jun	276	863
EAST CHUGACH	C GULF	10	0	25-Jun	0	0
ELIZABETH/CAPE ELIZABETH	C GULF	10	0	25-Jun	0	0
FLAT	C GULF	10	0	25-Jun	0	0
GORE POINT	C GULF	10	0	25-Jun	0	0
NAGAHUT ROCKS	C GULF	10	0	25-Jun	0	0
NUKA POINT	C GULF	10	0	25-Jun	0	0
OUTER (PYE)	C GULF	10	1	25-Jun	133	255
PERL	C GULF	10	0	25-Jun	0	95
PERL ROCKS	C GULF	10	0	25-Jun	0	0
AFOGNAK/TONKI CAPE	C GULF	9	0	28-Jun	0	0
CAPE DOUGLAS	C GULF	9	0	2-Jul	0	0
CAPE NUKSHAK	C GULF	9	0	28-Jun	0	0
KODIAK/CAPE BARNABAS	C GULF	9	0	8-Jul	0	60
KODIAK/CAPE CHINIAK	C GULF	9	0	8-Jul	0	193
KODIAK/CAPE KULIUK	C GULF	9	0	28-Jun	0	0
KODIAK/CAPE PARAMANOF	C GULF	9	0	28-Jun	0	0
KODIAK/CAPE UGAT	C GULF	9	0	28-Jun	0	220
KODIAK/GULL POINT	C GULF	9	0	8-Jul	0	36
KODIAK/MALINA POINT	C GULF	9	0	28-Jun	0	0
KODIAK/STEEP CAPE	C GULF	9	0	28-Jun	0	21
LATAK ROCKS	C GULF	9	0	28-Jun	15	348
LONG ISLAND	C GULF	9	0	28-Jun	0	146
MARMOT	C GULF	9	1	28-Jun	557	1050
NOISY	C GULF	9	0	28-Jun	0	0
RK NEAR SEA OTTER	C GULF	9	0	28-Jun	0	48
SEA LION ROCKS (MARMOT)	C GULF	9	0	28-Jun	0	12
SEA OTTER	C GULF	9	0	28-Jun	0	36
SHAKUN ROCKS	C GULF	9	0	28-Jun	4	224
SHAW	C GULF	9	0	2-Jul	0	0
SITKINAK/CAPE SITKINAK	C GULF	9	0	8-Jul	1	156
SUD	C GULF	9	0	2-Jul	0	0
SUGARLOAF	C GULF	9	1	2-Jul	862	1170
TWOHEADED	C GULF	9	0	8-Jul	48	421
UGAK	C GULF	9	0	4-Jul	0	0
USHAGAT/NW	C GULF	9	0	2-Jul	0	28
USHAGAT/ROCKS SOUTH	C GULF	9	0	2-Jul	0	38
USHAGAT/SW	C GULF	9	1	2-Jul	100	268
WEST AMATULI	C GULF	9	0	2-Jul	0	0
AGHIYUK	C GULF	8	0	8-Jul	0	4
AIUGNAK COLUMNS	C GULF	8	0	8-Jul	0	19
CAPE GULL	C GULF	8	0	28-Jun	0	49
CAPE KULIAK	C GULF	8	0	28-Jun	0	0
CAPE UGYAK	C GULF	8	0	28-Jun	0	0

Table 1. (continued)

SITENAME	REGION	RCA	ROOKERY	DATE	PUP	NON-PUP
CHIRIKOF	C GULF	8	1	8-Jul	196	584
CHOWIET	C GULF	8	1	8-Jul	612	877
KILOKAK ROCKS	C GULF	8	0	8-Jul	0	116
KODIAK/Bird Rock	C GULF	8	0	28-Jun	0	0
KODIAK/CAPE ALITAK	C GULF	8	0	8-Jul	0	0
KODIAK/CAPE IKOLIK	C GULF	8	0	8-Jul	0	70
KODIAK/CAPE UYAK	C GULF	8	0	4-Jul	0	0
KODIAK/STURGEON HEAD	C GULF	8	0	4-Jul	0	0
KODIAK/SUNDSTROM	C GULF	8	0	8-Jul	0	0
KODIAK/TOMBSTONE ROCKS	C GULF	8	0	4-Jul	0	0
NAGAI ROCKS	C GULF	8	0	8-Jul	7	220
PUALE BAY	C GULF	8	0	8-Jul	0	100
SUTWIK	C GULF	8	0	8-Jul	19	298
TAKLI	C GULF	8	0	28-Jun	0	0
UGAIUSHAK	C GULF	8	0	8-Jul	0	2
ATKULIK	W GULF	8	0	9-Jul	0	0
KAK	W GULF	8	0	9-Jul	0	210
LIGHTHOUSE ROCKS	W GULF	8	1	9-Jul	8	172
ATKINS*	W GULF	7	1	9-Jul	255	479
BIG KONIUJI	W GULF	7	0	9-Jul	0	0
BIRD	W GULF	7	0	9-Jul	0	444
CASTLE ROCK	W GULF	7	0	9-Jul	0	178
CATON	W GULF	7	0	9-Jul	0	688
CHERNABURA	W GULF	7	1	9-Jul	248	927
CLUBBING ROCKS NORTH	W GULF	7	1	9-Jul	292	378
CLUBBING ROCKS SOUTH	W GULF	7	1	9-Jul	601	638
JUDE	W GULF	7	1	9-Jul	340	759
NAGAI/MOUNTAIN POINT	W GULF	7	0	9-Jul	0	120
OLGA ROCKS NE	W GULF	7	0	9-Jul	0	78
OLGA ROCKS SW	W GULF	7	0	9-Jul	1	153
OMEGA	W GULF	7	0	9-Jul	0	0
PINNACLE ROCK	W GULF	7	1	9-Jul	742	1130
SEA LION ROCKS (SHUMAGINS)	W GULF	7	0	9-Jul	0	46
SOUTH ROCKS	W GULF	7	0	9-Jul	64	551
SUSHILNOI ROCKS	W GULF	7	0	9-Jul	12	355
THE HAYSTACKS	W GULF	7	0	9-Jul	0	72
THE WHALEBACK	W GULF	7	0	9-Jul	61	186
UNGA/ACHEREDIN POINT	W GULF	7	0	9-Jul	0	78
WOSNESENSKI	W GULF	7	0	9-Jul	0	16

\* Only the slab portion of Atkins rookery was surveyed and the cobble beach missed so 2011 count of the missed cobble beach region (116 pups and 245 non-pups) was added to the 2013 count for a total estimate of 371 pups and 724 non-pups.

Table 2. Pup and non-pup counts collected during 2013 ship-based surveys of sea lion rookery and haul-out sites. All counts were conducted from cliff tops or by researchers walking through the rookery\*.

SITENAME	REGION	RCA	ROOKERY	DATE	PUP	NON-PUP
EGG	E ALEU	6	0	8-Jul	0	35
INNER SIGNAL	E ALEU	6	0	8-Jul	0	91
OLD MAN ROCKS	E ALEU	6	0	8-Jul	3	35
OUTER SIGNAL	E ALEU	6	0	8-Jul	0	2
THE PILLARS	E ALEU	6	0	6-Jul	1	25
VSEVIDOF	E ALEU	6	0	6-Jul	0	72
AYUGADAK	C ALEU	2	1	28-Jun	50	112
KISKA/GERTRUDE-BUKHTI	C ALEU	2	0	28-Jun	0	11
KISKA/PILLAR ROCK	C ALEU	2	0	21-Jun	0	0
KISKA/SIRIUS POINT	C ALEU	2	0	21-Jun	0	0
KISKA/WITCHCRAFT	C ALEU	2	0	21-Jun	0	0
KISKA/WOLF POINT	C ALEU	2	0	21-Jun	0	11
LITTLE SITKIN	C ALEU	2	0	21-Jun	0	0
RAT	C ALEU	2	0	28-Jun	0	14
SEGULA/GULA POINT	C ALEU	2	0	21-Jun	0	0
TWIN ROCKS (KISKA)	C ALEU	2	0	28-Jun	0	0
AGATTU/CAPE SABAK	W ALEU	1	1	26-Jun	58	
AGATTU/GILLON POINT	W ALEU	1	1	24-Jun	100	186
AL Aid	W ALEU	1	0	26-Jun	13	76
ATTU/CAPE WRANGELL*	W ALEU	1	1	23-Jun	32	178
ATTU/CHICHAGOF HARBOR	W ALEU	1	0	23-Jun	0	58
ATTU/CHIRIKOF POINT	W ALEU	1	0	23-Jun	0	0
ATTU/KRESTA POINT	W ALEU	1	0	23-Jun	0	0
BULDIR/EAST CAPE	W ALEU	1	0	27-Jun	0	0
BULDIR/NW ROCKS	W ALEU	1	1	27-Jun	0	11
BULDIR/ROOKERY	W ALEU	1	1	27-Jun	0	0
NIZKI	W ALEU	1	0	26-Jun	0	0
SHEMYA	W ALEU	1	0	26-Jun	0	18



Table 3. Annual rates of change (%  $y^{-1}$  with  $\pm 95\%$  credible intervals) in counts of Steller sea lion pups and non-pups by region, 2000-2013.

Region	Pups			Non-Pups		
	Rate	-95% CI	+95% CI	Rate	-95% CI	+95% CI
Eastern Gulf of Alaska	4.34	2.12	6.27	4.98	2.41	7.50
Central Gulf of Alaska	1.93	0.36	3.49	1.97	0.89	3.08
E/C Gulf combined	2.66	1.38	3.91	3.23	2.00	4.50
Western Gulf of Alaska	3.58	1.89	5.38	3.60	2.36	4.98
Eastern Aleutian Is.	3.34	1.69	4.82	2.24	0.66	3.76
EAWG Combined	3.46	2.32	4.59	2.94	2.04	4.04
East of Samalga Pass	3.14	2.25	3.94	3.06	2.26	3.82
Central Aleutian Is.	-0.40	-1.47	0.69	-0.36	-1.34	0.63
Western Aleutian Is.	-8.94	-10.37	-7.50	-7.20	-9.14	-5.51
W of Samalga Pass	-1.46	-2.42	-0.45	-1.33	-2.19	-0.40
Bering Sea (Walrus I.)	-7.34	-11.18	-2.71			
Western DPS in AK	1.75	1.07	2.40	1.87	1.25	2.50

Figure 1. Terrestrial rookery and haul-out sites surveyed in 2013 in the range of western and eastern distinct population segment (DPS) of Steller sea lion in Alaska. Targeted survey regions are noted and aerial survey route represented by the dotted line.

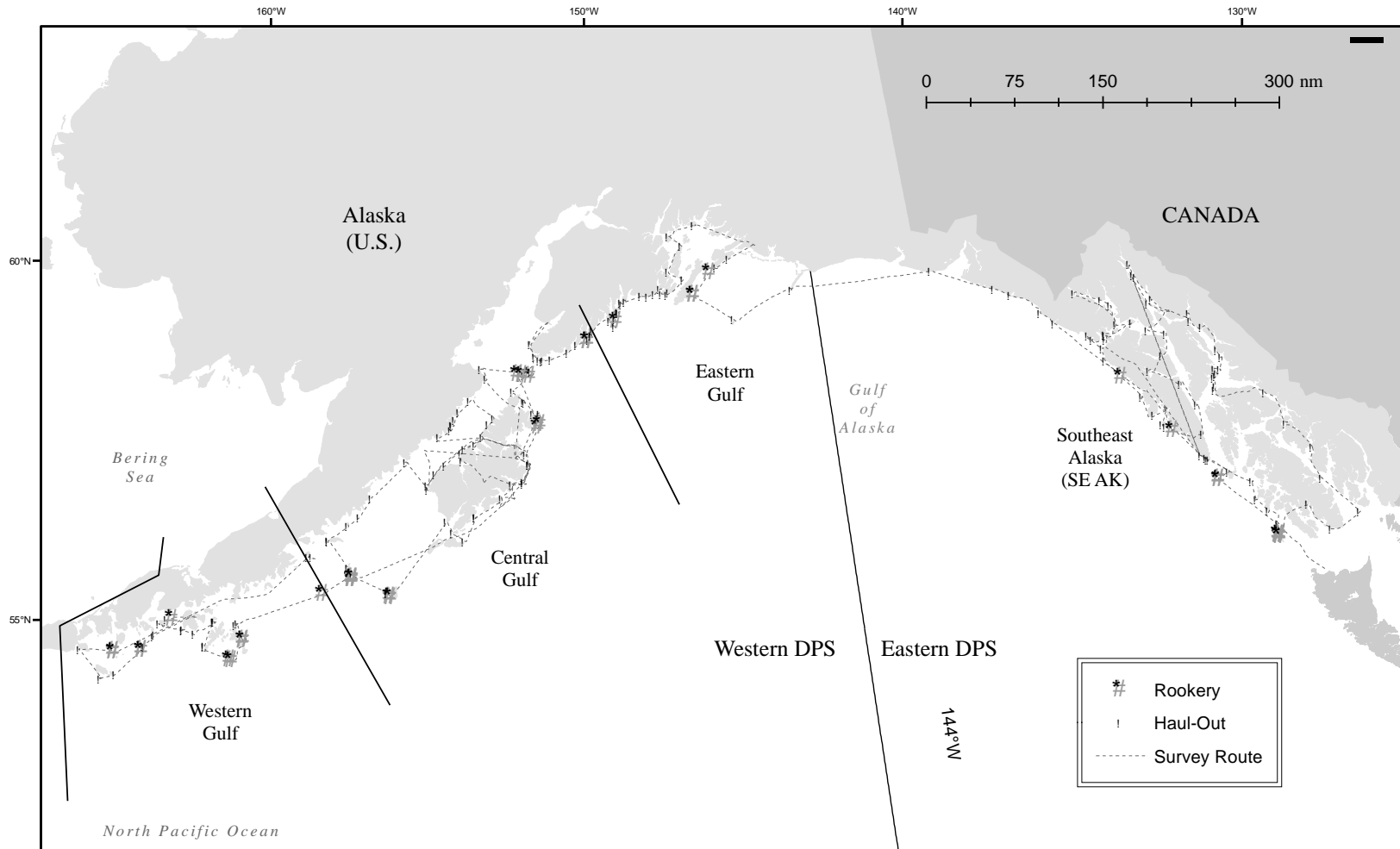


Figure 2. Steller sea lion terrestrial rookery and haul-out sites where pup and non-pup counts were conducted during 2013 ship-based surveys in the eastern, central, and western Aleutian Island regions (wDPS).

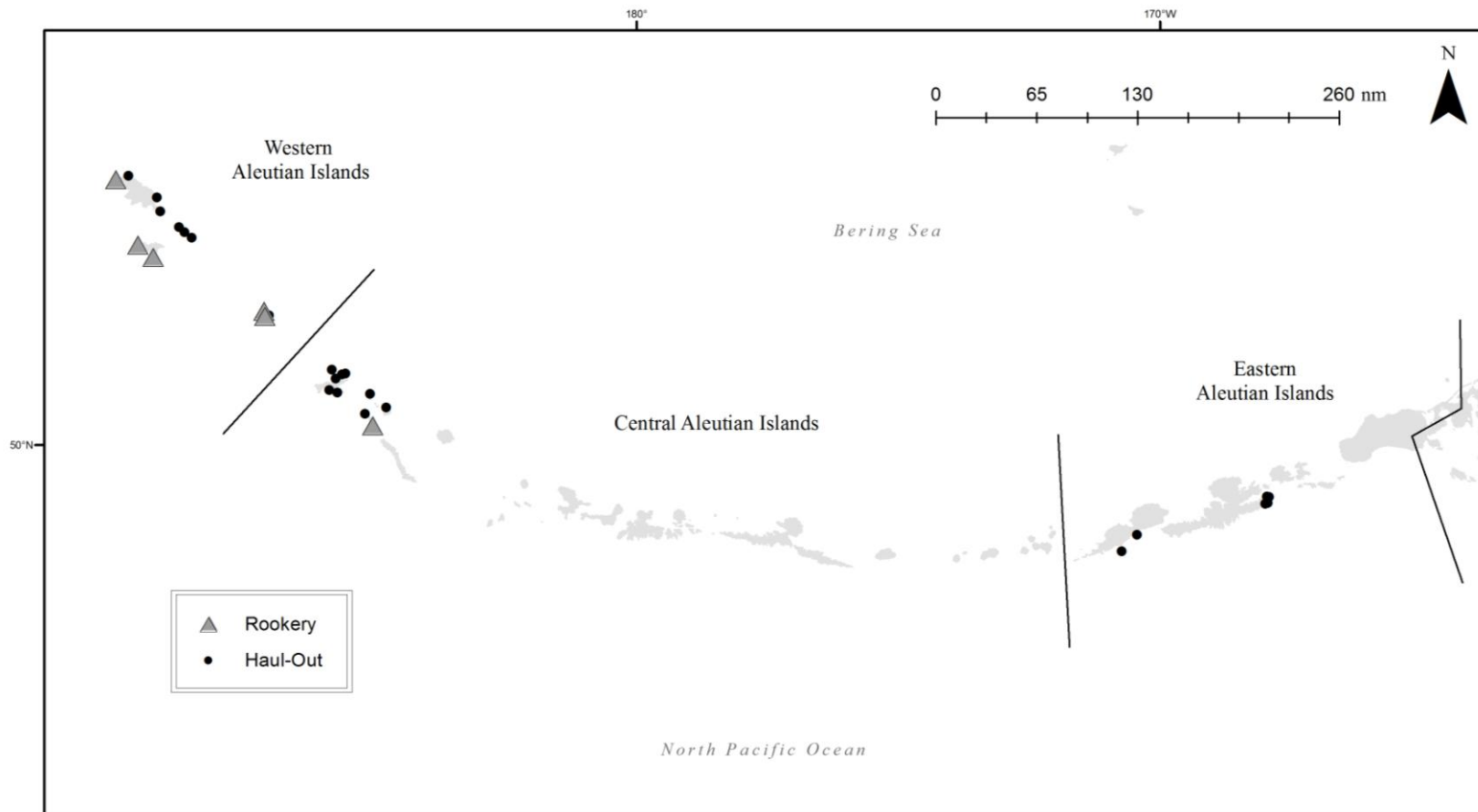


Figure 3. Estimated counts of western Steller sea lion pups by region in Alaska using agTrend (Johnson and Fritz, in review), 1990-2013. ALEU=Aleutian Islands; GULF=Gulf of Alaska; BERING=Walrus Is (Pribilofs). Blue line=average trend 2000-2013. Grey zone=95% credible interval of estimated count.

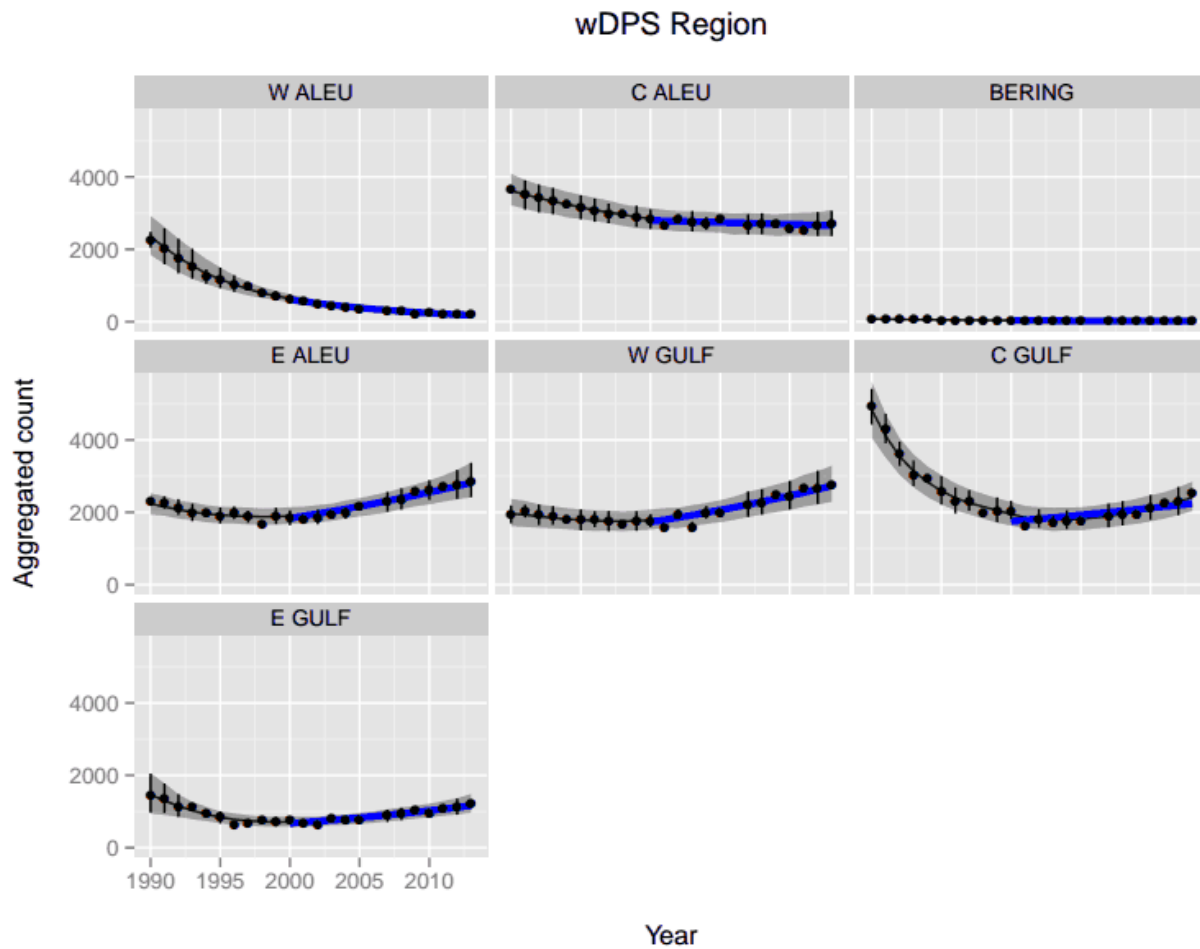


Figure 4. Estimated counts of western Steller sea lion non-pups by region in Alaska using agTrend (Johnson and Fritz, in review), 1990-2013. ALEU=Aleutian Islands; GULF=Gulf of Alaska. Blue line=average trend 2000-2013. Grey zone=95% credible interval of estimated count.

