

Alaska Fisheries Science Center
National Marine Mammal Laboratory
7600 Sand Point Way NE, Bin C15700
Seattle, Washington 98115-0070

(206) 526-4313

FAX: 526-6615

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MEMORANDUM FOR: The Record

FROM: Rod Towell, Rolf Ream, John Bengtson and Jeremy Sterling

SUBJECT: 2010 northern fur seal pup production and adult male counts on the Pribilof Islands, Alaska. (Updated 12/5/12)

Numbers of northern fur seal, *Callorhinus ursinus*, pups were estimated using a mark-recapture method, shear-sampling, on the Pribilof Islands during August 2010. We estimated 94,502 (SE = 1,120, Table 1) pups were born on St. Paul Island and 17,973 (SE = 323, Table 1) pups were born on St. George Island. To minimize disturbance, dead pup counts were conducted at 4 sample rookeries on St. Paul Island and 3 sample rookeries on St. George Island. As in 2006 and 2008, this dead pup counting procedure resulted in a ratio estimation protocol for the calculation of the estimate of the total number of pups born. The observed pup mortality rates were 5.6% on St. Paul Island and 5.3% on St. George Island. Pup production was not estimated on Sea Lion Rock, a small island approximately 500 m from St. Paul Island in 2010. The 2010 pup production estimate for St. Paul Island is 8.0% less than the estimate in 2008 (Figure 1). The 2010 pup production estimate for St. George Island is 1.0% less than the estimate in 2008. The overall decrease in pup production for St. Paul and St. George Islands combined from 2008 to 2010 is approximately 6.9%. Since 1998 pup production on St. Paul Island has declined at an annual rate of 5.4% (SE = 0.34) and on the Pribilof Islands (St. Paul and St. George Islands) at an annual rate of 4.9% (SE = 0.37).

Adult male northern fur seals on St. Paul, and St. George Islands (Table 2) were counted over the period July 9 to 17, 2010. Counts of territorial males with females ("harem" males) on St. George Island decreased by 4.9% compared to 2009. Idle males on St. George Island increased in comparison to 2009 by 25.0%. On St. Paul Island the idle males decreased by 7.4% and the "harem" males decreased by 3.7% (Figure 2). Overall, the total number of adult males counted on the Pribilof Islands in 2010 decreased by 3.3% from 2009 to 10,674. The total number of territorial males with females decreased by 3.8% on the Pribilof Islands.

Table 1.-- Numbers of northern fur seal, *Callorhinus ursinus*, pups born on the Pribilof Islands, Alaska in 2010 by rookery. Estimates are shown for the numbers alive at the time of shearing and the estimated total number of pups born.

Rookery	Live	Born ¹
<u>St. Paul Island</u>		
Lukanin	2,791	2,956
Kitovi	3,884	4,114
Reef	11,125	11,784
Gorbatch	8,282	8,773
Ardiguen	1,010	1,070
Morjovi	7,004	7,419
Vostochni	14,115	14,951
Polovina	2,590	2,743
Little Polovina ²	22	23
Polovina Cliffs	7,512	7,957
Tolstoi	9,847	10,430
Zapadni Reef	4,155	4,401
Little Zapadni	6,752	7,152
Zapadni	10,129	10,729
Total	89,218	94,502
<u>St. George Island</u>		
South	3,713	3,922
North	5,071	5,357
East Reef	1,452	1,534
East Cliffs	3,834	4,050
Staraya Artil	976	1,031
Zapadni	1,968	2,079
Total	17,014	17,973

¹ Pups born is calculated for each rookery using the live pup estimates and a ratio estimator for mortality and the total pups born estimates.

² Live and dead pups for Little Polovina were estimated without shear-sampling to reduce disturbance to this small rookery.

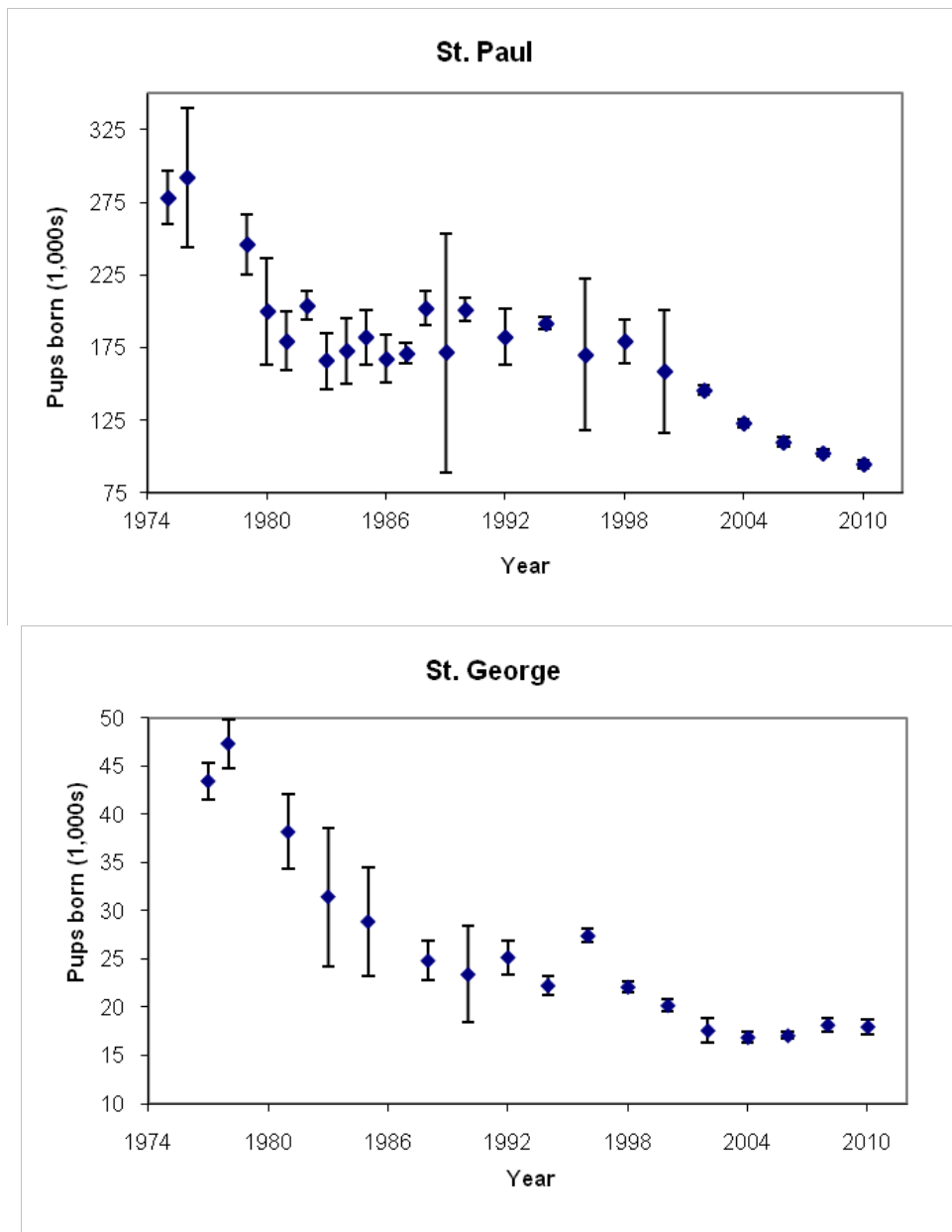


Figure 1. – Northern fur seal pups born on the Pribilof Islands 1975-2010. Error bars are approximate 95% confidence intervals.

Table 2.--Number of adult male northern fur seals counted, by rookery, Pribilof Islands, Alaska, July 2010.

Rookery	Date (July)	Class of adult male*			Total
		2	3	5	
<u>St. Paul Island</u>					
Lukanin	16	33	149	95	277
Kitovi	16	56	208	145	409
Reef	15	169	507	262	938
Gorbatch **	15/17	107	326	332	765
Ardiguen	15	7	60	16	83
Morjovi	13	152	376	361	889
Vostochni	12/13	217	701	442	1,360
Polovina	14	29	92	187	308
Little Polovina	14	5	1	99	105
Polovina Cliffs	14	70	395	93	558
Tolstoi	10	141	329	351	821
Zapadni Reef **	11/17	76	175	238	489
Little Zapadni	11	159	255	229	643
Zapadni **	11/17	257	400	512	1,169
Island total		1,478	3,974	3,362	8,814
<u>St. George Island</u>					
South	12	51	188	74	313
North	9	142	254	233	629
East Reef	10	33	78	83	194
East Cliffs	10	57	183	194	434
Staraya Artil	12	20	34	46	100
Zapadni	12	26	93	71	190
Island total		329	830	701	1,860

* Adult males are assumed to be equal to or greater than 7 years of age. Class 2 – territorial without females; Class 3 – territorial with females; Class 5 – idle males.

** Haulouts adjacent to the rookery were counted on a different day than the rookery area.

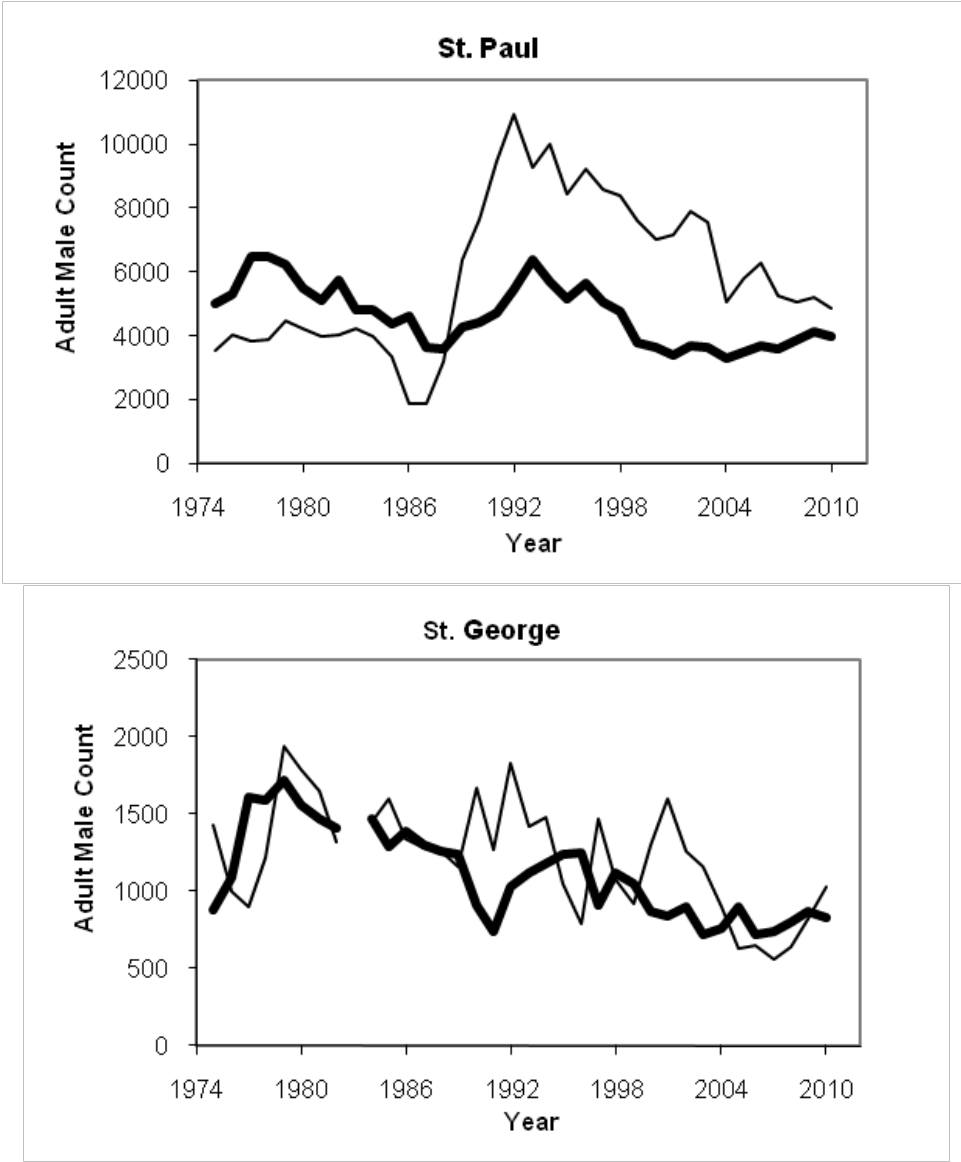


Figure 2. – Northern fur seal adult males (harem – thick line, idle – thin) counted on the Pribilof Islands 1975-2010.