Steller Sea Lions *(Eumetopias jubatus)* Demographic Studies in Russian Waters

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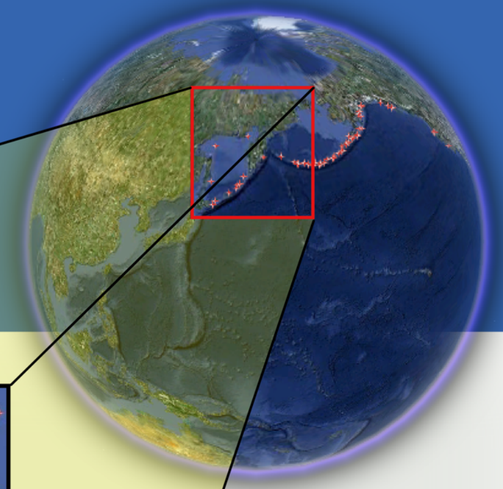

Abstract

Steller sea lions (SSL) underwent a mysterious decline throughout most of their range through the mid-1970s - 1990s. Currently, the western Aleutian Islands are experiencing the most dramatic declines within the Alaskan population. Although there are no demographic data available for this area, there are vital rates estimates for rookeries to the west in the Russian population. Here, we provide some of the first results from a long-term study to provide life history data useful to sea lion management in Alaska. We used resight data from 7,807 SSL pups branded on 10 major rookeries across the Russian SSL range in 1989-2010 to estimate survival and reproductive rates at the major rookery complexes with diverging population trends. Two genetically distinct SSL populations inhabit Russian waters, Asian and Western, divided at longitude 162° E. Annual productivity of the Asian population is < 6,000 pups: 100 in eastern Kamchatka, ~ 700 at Sakhalin Is., 2,000 in the northern Sea of Okhotsk, and 3,000 in the Kuril Islands. First-month pup survival was high (~95%). Survival to age 1 was only 50%. Annual survival of age 1+ was 80-90% through age 15, then decreased rapidly. Non-pup mortality during the breeding season at rookeries was low (<1%). No females observed giving birth at age 3 years old. Approximately 28% of females had their first pup at age 4, 75% at age 5, and 90% at age 6. Mean annual birthrate for females age 3+ was 52%, but it varied widely (41% - 72%) between rookeries and years. The current estimated abundance of the Asian population is ~ 25,000 - 28,000 including pups. Over the last 10 years SSL abundance has been increasing in the Kuril Islands, northern Sea of Okhotsk, and Sakhalin Island, but has stabilized at a historically low level in eastern Kamchatka. Our demographic studies indicate that the Asian population consists of at least 4 management units with different population trends and movement patterns.

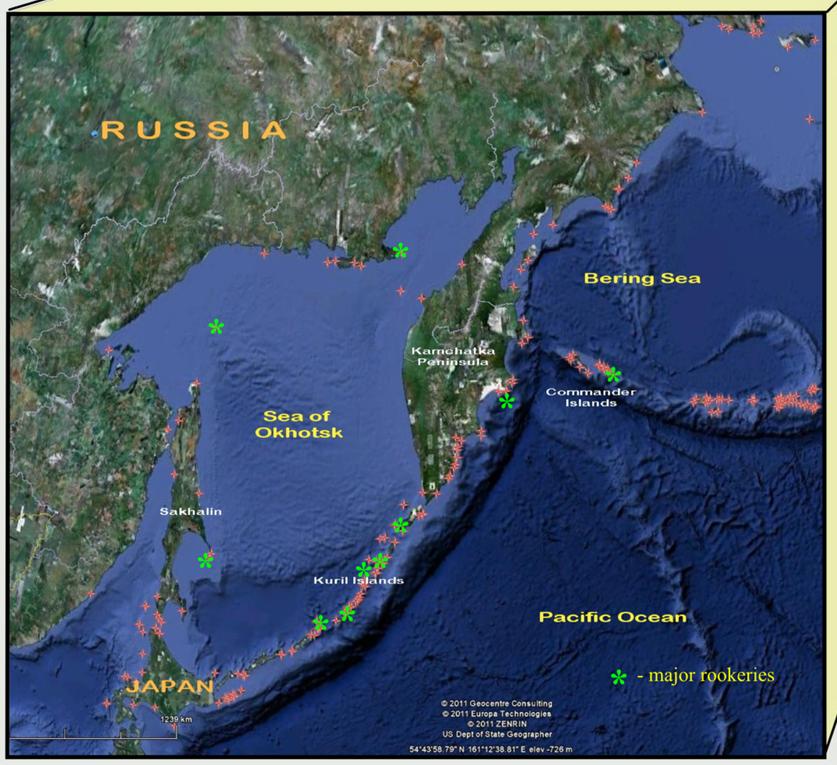

Figure 1. Steller sea lion sites along the Asian coast.

Observation blind at Matykil' I. in northern part of the Sea of Okhotsk.

Demographic features of the Asian population of Steller sea lions

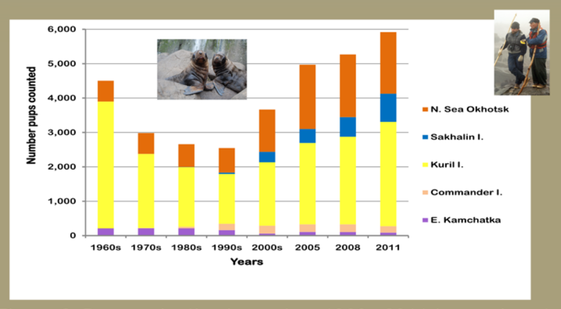

Figure 2. Pup production by region, 1960s-2011 (ground couts).

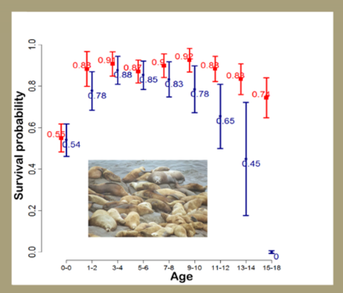

Figure 3. Age specific survival rates (males in blue; females in red).

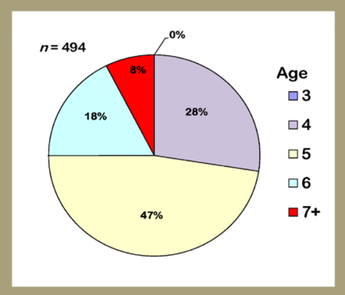

Figure 4. Age at first reproduction

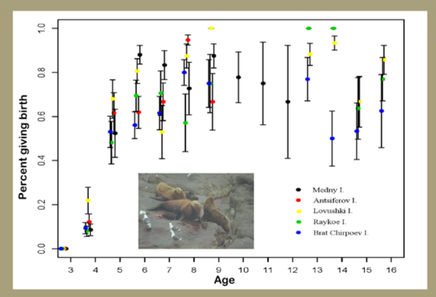

Figure 5. Birth rates.

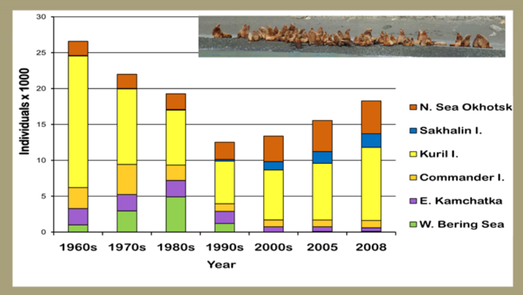

Figure 6. Changes in total abundance by region, 1960s-2008 (count data).

Pup with alfa-numeric brand.

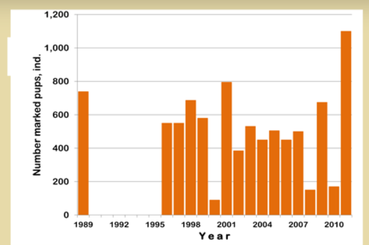

Figure 7. Pup branding in Russian waters, 1989-2011.

Survey and resighting brands at Iony I.

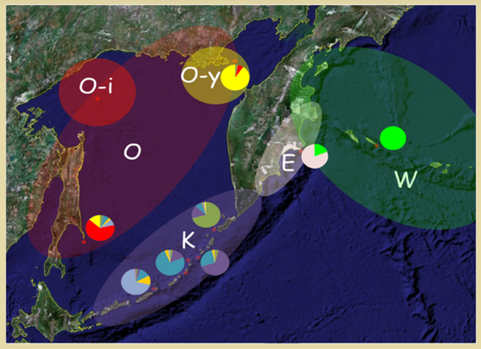

Figure 8. Management units of Steller sea lions in Russia.

W - Commander Islands belong to the Western population; **E** - Eastern Kamchatka; **K** - Kuril Islands; **O** - Northern part the Sea of Okhotsk; **O-i** - Iony Island group; **O-y** - Yamsky Islands group.

Pie charts refer to level of mixing of mature branded animals among the rookeries.

Field team is branding SSL pups at Kuril Islands, 2005.

Field camp at Brat Chirpoev Island.

Acknowledgment

Several hundred of Russian, American, Japanese, and Ukrainian scientists, students, and volunteers have assisted in surveys, pup branding, and brand resight data collection since 1989. We would like to especially thank Jason Baker, Alexander Boiko, Tom Loughlin, Alexander Makhnyr, Mikhail Maminov, Richard Merrick, Nikolay Pavlov, and Adolf Perlov who pioneered the use of pup branding on Russian rookeries. We thank the field teams who collected brand resight information on the many different islands and who have continued the pup branding program: Sveta Artemieva, Victor Diyachkov, Tracey Goldstein, Kaoru Hattori, Hiroshi Hoshino, Takeomi Isono, Alexey Kondratyuk, Alexey Kuzin, Evgeny Mamaev, Victor Nikulin, Peter Permyakov, Tanya Shulezhko, Andrey Tretyakov, Alexey Trukhin, Vladimir Vertyankin, Akihiko Wada, Jason Waite, Orio Yamamura, and many other assistants. We also thank the crews of the charter boats "Bol'sheretsky", "Vsevolod Timonov", "Grodno", "Dol'sk", and "Georg Steller".

Funding was provided by the National Marine Fisheries Service, Alaska SeaLife Center, Japanese Fisheries Agency, and Russian Academy of Sciences.

The long-term research program was conducted under the authority of all required Soviet and Russian research permits.

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