

Growth, behavioral ontogeny and seasonal change in Steller sea lion pups during their first winter.

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To assist recovery efforts for the Steller sea lion, we are examining the combined roles that physiological development, nutritional source and the demand for independent foraging play in the ontogeny of behavior by sea lion pups during their first winter. To accomplish this, we captured, measured, sampled and attached time-depth recorders (TDR) to 30 and 39 sea lions in Prince William Sound at 5 months of age during November 2005 and 2007, respectively. We recaptured 20 pups with functioning TDRs ($n = 10$ male and 10 female) at 10 months of age during March/April 2006 and 2008. Most pups were still suckling by the end of their first winter, and pups gained 30 ± 13 kg mass by individual of which 18 ± 9 kg was lipid mass. Growth was similar between sexes (ANOVA: $P=0.334$, $P=0.112$, respectively). Cumulative swimming and diving effort during the winter were generally unrelated to growth, but one measure – rate of vertical travel – was significantly, but weakly correlated with change in mass (linear regression: $P=0.02$, $R^2=0.257$) and change in lipid mass ($P=0.009$, $R^2=0.339$). While this effect was weak, the two individual pups having greatest vertical travel (exceeding all other pups by > 1000 m/d) were also the individuals having smallest increase in mass and lipid mass (-2 kg to 6.5 kg). We further identified 7000 bouts of diving made by these 20 pups. Most measures of bout activity exhibited a seasonal peak in February (GLM: bout depth $F(4,6801)=115.090$, $P<0.001$; proportion submerged $F(4,6801)=24.351$, $P<0.001$; vertical travel $F(4,6801)=74.909$, $P<0.001$), and significantly greater diving intensity and focus on remaining submerged during night was observed during this peak as well. Seasonal influences on behavior of these suckling pups may indicate increased attempts at independent prey capture or a shift in the type and availability of prey available.

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