

Remote Monitoring of Vital Rates in Harbor Seals (*Phoca vitulina*)

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Harbor seals (*Phoca vitulina*) declined by >63% in Prince William Sound (PWS) since ~1980 and continue declining at 2.4%/yr (1990-2005). Declining populations can be evaluated by estimating long-term survival and reproduction and quantifying effects of proximate factors on those vital rates. In 2003, we initiated a vital rates study in PWS; 122 harbor seals (70.5% females, 61.5% <1 year old) received subcutaneously-implanted 5-yr VHF transmitters with mortality sensors. We conduct a comparable study (155 5-yr VHF implants) in the rapidly declining seal population in Glacier Bay (GLBA). At capture/tagging we collect samples to assess age, genetics, body condition and health, diet, immunocompetency, reproductive condition, disease status and contaminant load. In 2005, with NPRB funding, we established six remote-monitoring stations in PWS that transmit presence/survival data from radio-tagged harbor seals via GOES. Survival data from VHF implants paired with health-related data for those individuals may identify variables that differentiate between seals that survive and non-surviving/censored seals; potentially elucidating factors contributing to seal declines. Code was written to automatically download GOES-transmitted data and sort/filter data, eliminating false positives (~25% of data). Preliminary results (log-linear models) for telemetry-resight data from remote stations indicate that resight rate was highest in year tagged, with possible age*mark*year effects. Both sexes had equal resight probability. Area comparison (females only) showed weak evidence of higher resight probability in GLBA; pups were less likely to be resighted in subsequent years. Estimates of survival rates and multivariate analysis of health data, relative to survival, will be conducted in the future.



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