

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

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Harbor seals (*Phoca vitulina*) have declined in parts of Alaska, while seal populations in other areas of the state remained stable or increased. Genetic data indicate that movements of individuals between areas cannot explain the declines. Fluctuations in population abundance can be evaluated by estimating survival and reproduction, and quantifying effects of proximate factors on those vital rates. In 2003 we initiated long-term vital rates studies in Prince William Sound (PWS) where seals numbers have declined by >65% (- 3.1%/yr 1990-2004). Thus far 122 seals in PWS have received subcutaneous VHF transmitters (Telonics IMP-300-L) duty-cycled for 5 years of battery life. At the time of capture we collect samples to assess age, genetics, body condition and health, diet, endocrinology profiles, disease and contaminant exposure. Long-term vital rates data from VHF implants, paired with data on diet and health of individuals, permits an assessment of what variables may differentiate between seals that survive and reproduce and those that do not, potentially elucidating factors contributing to declines of seals in those areas. In summer 2005, with funding from NPRB, we established six land-based dataloggers at multiple haulout sites to continuously monitor presence/absence of radio-tagged individuals and transmit those data via a geostationary operational environmental satellite (GOES). Initial problems with ambient electronic interference resulted in an unacceptably high level of false positive signals, identified by incorrect pulse rates or transmission times. Equipment modifications reduced the recording of false positives. Detection of seals radio-tagged in 2005 was high (92.7%) but datalogger resight (signal detection) of seals tagged in 2003 and 2004 was extremely low (27.3% and 10.4%, respectively). It is unlikely that all of these censored (undetected) signals are reflective of mortality rate. Herein we examine frequency of false-positive GOES data and discuss plans for ground-truthing and improving quality of data collected via remote monitoring.

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