Do differences in harbor seal percent body fat predict population trends in Glacier Bay and Prince William Sound, Alaska?

Karpovich, Shawna A.[1]; Pendleton, Grey W.[2]; Blundell, Gail M.[2]

(1) Alaska Department of Fish and Game, 1300 College Rd, Fairbanks, AK 99701 USA
(2) Alaska Department of Fish and Game, 802 3rd St, Douglas, AK 99811 USA

shawna_karpovich@fishgame.state.ak.us

Marine mammals utilize fat stored in blubber during periods of high energy demand and low food availability. We examined percent body fat relative to population trends of harbor seals (*Phoca vitulina*) from two areas of Alaska (Glacier Bay [GLBA], a rapidly declining population; and Prince William Sound [PWS], a population that after a long period of decline is relatively stable) to determine whether seals from the GLBA population are nutritionally stressed. Harbor seals were live-captured in 2003-2006 (n=240) during February-PWS, April-both sites, June-PWS, and September-GLBA, and percent body fat was estimated via deuterium oxide administration. Harbor seals undergo dramatic seasonal changes in fat content associated with gestation, lactation, molt, and forage availability. To control for live-capture sample collection during different seasons, we described seasonal variation in body fat, calculated using sternal blubber depth, for harbor seals harvested throughout Alaska from 1972-2004 (n=874). All cohorts were leanest in September during/following molt. Harvested adult harbor seals (>5 yrs) were fattest in January (+10.68±2.59% compared to September), subadults (1-5 yrs) were fattest in March (+6.11±2.25%), and pups were fattest immediately post-weaning in July (+7.15±2.41%). Average live-captured percent body fat was compared across seasons using predicted seasonal changes in body fat from harvested seals. In GLBA during April, subadult (sexes combined) and adult male harbor seals were significantly fatter than in PWS during April ($p=0.04$, $p=0.003$) and February ($p=0.009$, $p=0.01$). Adult female sample size was insufficient for comparison, and pups were not different. Higher percent body fat for GLBA seals suggests the population decline is not attributable to a low nutritional plane or chronic disease; instead sudden factors such as predation, acute lethal disease, or emigration are more likely. Also, GLBA pups, the only cohort not fatter than PWS, may lack sufficient reserves relative to GLBA costs. More information concerning adult females is needed.

Contents