

Grant in Aid of Research from the Society for Marine Mammalogy.

Annual summary report: This study aimed to assess the trophic ecology of southern elephant seals (SES) *Mirounga leonina* at Marion Island (MI), and forms part of the long-term (1983 – present) mark-recapture study on MI, in the southern Indian Ocean. During the 2013 breeding season (Sept. – Nov.) 121 recently weaned SES pups were physically weighed and a whisker was collected from each individual. Forty-five of the sampled pups were born to mothers of known ages, of which 36 adult females were photogrammetrically weighed on their arrival at MI for the breeding season. Whisker regrowths were collected from 30 juveniles, photogrammetrically reweighed (ongoing) upon their return from the first foraging trip. The SMM grant was used to analyze the stable isotopes (SI) ratios of chronologically sampled whiskers of 14 juvenile and 20 adult female SES (839 SI samples). Adult females occupied a trophic level (T.L) of 4.3 ± 0.15 , indicative of a myctophid fish diet, while juveniles consumed 38.5 ± 0.12 % crustaceans (T.L of 3.8 ± 0.12) (mean \pm SD). The relationship between the *in utero* $\delta^{15}\text{N}$ SI signature of the pup's and corresponding mother's whisker was non-linear. This discrepancy in the mother-pup whisker isotopic fractionation factor along the length of the whisker is being quantified; whereafter the SI signature of the pups' whiskers will be used as a proxy for the mother's diet. The next step is to investigate the role diet plays in female body mass and the subsequent maternal investment in offspring. Envisaged publications will be submitted in mid-2015.

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