Breeding numbers and success of *Eudyptes* penguins at Marion Island, and the influence of mass and time of arrival of adults

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At Marion Island, numbers of macaroni penguins *Eudyptes chrysolophus* and especially eastern rockhopper penguins *E. chrysocome filholi* have been decreasing. For both species the time of arrival of females for breeding, and for rockhopper penguins the mass of females on arrival, was significantly related to breeding success[1]. Therefore, over-wintering conditions appear to influence breeding success. The mass on arrival of macaroni penguins has fluctuated around a constant level, but was noticeably poor following the *El Niño* of 1997/98[2]. The mass of returning rockhopper penguins has been decreasing, so that they now commence breeding in a poorer condition than previously. In 2007, instruments were attached to some birds at the conclusion of their moult to investigate the direction of travel to the winter feeding grounds. One male macaroni and two unsexed rockhopper penguins moved to the southeast, whereas three macaroni penguins of both sexes travelled south or southwest. The male macaroni penguins travelled farther than the female in the same time. Should winter food be displaced to the south, the condition of female macaroni penguins returning to breed may also deteriorate.

1.   Crawford, R. J. M., Dyer, B. M., Cooper, J. & Underhill, L. G. Breeding numbers and success of *Eudyptes* penguins at Marion Island, and the influence of mass and time of arrival of adults. *CCAMLR Science* **13**, 175–190 (2006).
2.   Crawford, R. J. M., Duncombe Rae, C. M., Nel, D. C. & Cooper, J. Unusual breeding by seabirds at Marion Island during 1997/98. *African Journal of Marine Science* **25**, 453–462 (2003).