

Variability of responses of Wandering Albatrosses *Diomedea exulans* to human disturbance

Marianne S. de Villiers¹, Les G. Underhill¹, Mariëtte Wheeler¹, John Cooper¹, Andreas Lopata² and Peter G. Ryan³

¹Avian Demography Unit, Department of Statistical Sciences, University of Cape Town, Private Bag, Rondebosch 7701, South Africa; ²Institute of Infectious Diseases and Molecular Medicine, Allergy Research Group, University of Cape Town, Private Bag, Rondebosch 7701, South Africa; ³Percy FitzPatrick Institute, University of Cape Town, Private Bag, Rondebosch 7701, South Africa

From a conservation management perspective (ARESSA theme 4), there is a trade-off between the gravity of a threat and its manageability. Compared to other threats to wildlife in the sub-Antarctic, human disturbance may be relatively innocuous but is easily managed. There is much variability in animals' responses to disturbance (ARESSA theme 3), and understanding this is key to managing visited sites. We investigated the variability in responses of Wandering Albatrosses at Marion Island to pedestrian approaches. We compared responses of birds with different histories of disturbance: high intermittent disturbance (near Base), low intermittent disturbance (far from Base) and researcher disturbance (study colonies). History of disturbance was the factor that best explained variability in behavioural responses. During the prospecting phase of breeding, birds near Base were more likely to stand when approached, and had higher response scores, than birds far from Base. During late incubation, birds in study colonies or near Base had higher scores than birds far from Base. During the brooding phase, study colony birds had higher response scores than non-study colony birds, and birds at colonies closest to Base had the highest scores. We investigated whether the relationship between history of disturbance and behavioural response could be explained through the effects of chronic disturbance on health and/or immunocompetence. Birds with low stress protein levels (HSP90) and high total protein levels had low response scores. Most of the variance in stress protein levels was explained by history of disturbance, largely due to the elevated stress protein levels of study colony birds. Disturbance may affect breeding success in this species. For brooding birds, better breeding records were associated with lower behavioural response scores. Furthermore, over three days of repeated approaches to birds far from Base, birds approached most times had the lowest breeding success. It remains to demonstrate a link between history of disturbance, immunocompetence and breeding success. The current system of management zones and permitting provides protection from human disturbance for Wandering Albatrosses on Marion Island. We recommend that research programmes on breeding seabirds include controls to measure the effects of human disturbance on breeding success.