



University of St Andrews

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Monday, January 13, 2014

To Whom It May Concern:

RE: SG104 Title: Attend the 20th biennial conference for the society of marine mammology to present on beaked whale social structure. (Amount requested: £500)

Please find attached a brief report detailing the results of the above grant award.

I would also like to thank MASTS for making it possible for me to attend the biennial conference in the third year of my PhD, when collaborations and networking are especially relevant.

Yours sincerely,

A handwritten signature in black ink, appearing to read 'CD' followed by a flourish.

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Objective:

This funding enabled me to attend the 20th biennial conference for the society of marine mammology in New Zealand, to present on Blainville's beaked whale social structure.

Abstract for the presentation:

Comparisons across cetacean species have revealed that deep-diving foragers have a diversity of social structures not necessarily constrained by a shared ecology. An understanding of the social structure of a species can furthermore facilitate better conservation management for that species. We used sixteen years of photo-identification data from a population of Blainville's beaked whales (*Mesoplodon densirostris*) from waters off Abaco Island in the Bahamas to quantify social relationships between individuals at different stages of their reproductive cycle. The dataset encompassed three generations of individuals, including 27 females with documented calves (range 1 to 4 calves). We found that females with dependent calves preferentially associate with other female-calf pairs, while females without dependents prefer to associate with one another. The mean association index of dyads in different reproductive classes was 0.0092 (sd 0.019), whereas it was 0.0202 (sd 0.023) for animals in the same reproductive class groups, an order of magnitude difference (Mantel test, $t = 2.55$; $p = 0.005$). As a case study we examine the association history of an adult female over a 14-year period, and 49 sightings, detailing her preferred and avoided associations with other females through three different calving cycles as her reproductive state changed over the study period. We discuss how such association strategies could be adaptive, for example in communal care or defence of calves.

Results of the grant:

The social structure analysis I presented at the conference is one of my PhD chapters that I am undertaking at the University of St Andrews.

“It does not make sense to regulate minor changes in behavior having no adverse impact; rather, regulations must focus on significant disruption of behaviors critical to survival and reproduction.”

National Research Council (NRC) 2000

As data on behavioural responses to sound is so limited for beaked whales, models are an alternative to better understand outcomes of disturbance, and these models require as much biological information about a species as possible in order for their predictions to be as adequate as possible. Many of these models are being developed at the Centre for Ecological and Environmental Modelling (CREEM) at the University of St Andrews. Understanding a species social structure can help provide crucial information for these models. (Ironically, I was able to spend time with people from CREEM in New Zealand explaining my study.)

Funding of this small grant from MASTS enabled me to communicate this analysis on social structure, the first of its kind on a beaked whale that is under threat. There was lots of interest, particularly due to the analysis covering three generations of animals, and also the dataset allowing us to follow adult females through four calving cycles. I was offered a dataset from Hawaii to add to this analysis, and am also now in negotiation with several potential collaborators for future work.