

Optimal mating group size of dusky dolphins (*Lagenorhynchus obscurus*)

Dara N. Orbach¹, Jane M. Packard², and Bernd Würsig¹

(1) Department of Marine Biology, Texas A&M University at Galveston, Galveston, TX, 77553, USA

(2) Department of Wildlife and Fisheries Sciences, Texas A&M University, College Station, TX, 77843 USA

Corresponding author: orbachd@tamug.edu

Theoretically, optimal group size during foraging and mating activities involves tradeoffs between ultimate costs and benefits. During mating interactions of dusky dolphins (*Lagenorhynchus obscurus*), several males chase one receptive female in apparent scramble competition. The female may easily escape the group when few males are present; however, increased intra-sexual competition may reduce each male's opportunities to copulate when many males are present. We tested the predictions that the size of mating groups is a function of increasing proximate costs and decreasing benefits. Boat-based focal follows of mating groups (N= 44) were conducted off Kaikoura, New Zealand between October 2011-January 2012. Behaviors were scored from continuous video recordings. GPS coordinates were recorded to measure travel variables. We measured two indices of cost: (1) speed of travel and (2) monopolization potential (number of individuals close to a copulating pair). The latter was positively correlated with group size ($r = 0.415$, $n = 38$, $p < 0.05$). Indices of benefits were: (1) number of intromissions, (2) duration of intromissions, and (3) energy savings (linearity of travel). The latter was negatively correlated with group size ($r = -0.487$, $n = 44$, $p < 0.05$). The optimal mating group size predicted by the model was 6 and the modal observed mating group size was 5 dolphins. For behaviorally plastic species such as dolphins, we suggest that multiple factors may influence the decision of when to join or leave a mating group and that mutual assessment models should also be examined.