

Appendix 1: Poster Abstracts

Effects of blubber collection procedure and seawater exposure in relation to blubber hormone levels: standardization of lipid extraction technique

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Blubber hormone measurements obtained from biopsies of free-ranging cetaceans provide sufficient sample sizes for population-level health assessments. However, these measurements are often compared to samples excised directly from carcasses obtained from stranding or bycatch events and yet a comprehensive analysis of the effects of dart sampling on blubber hormone measurements has not been conducted. Blubber samples acquired from stranded common dolphins (*Delphinus capensis*) were used to investigate the effect of the following on hormone concentration: 1) anatomical location, 2) blubber depth, 3) the act of darting, 4) seawater exposure, and 5) extraction technique: manual extraction vs. accelerated solvent extractor (ASE). We then examined the potential ramifications of these five variables upon hormone quantification (cortisol and progesterone). We found significant variation between both blubber depth ($p = 0.0009$) and anatomical location ($p = 0.0002$) on blubber cortisol levels. Compared to excising samples directly from the carcass, the darting process caused significant ($p = 0.00001$) lipid loss. Seawater exposure (1 and 10 min) did not appear to cause further lipid loss ($p = 0.9$ and 0.3) for either sampling technique, however, we found a decreasing trend in cortisol concentration (but not progesterone) in excised and biopsied samples exposed to seawater irrespective of time. Though the ASE extraction process produced only 17% more lipid mass over the manual extraction, it produced >100% more hormone (cortisol and progesterone). This study represents an important step in validating the incorporation of blubber hormone levels from projectile biopsies in health assessments of free-ranging cetaceans. In addition, the novel extraction process and normalization based on lipid weight for blubber hormone quantification provide a more reliable methodology and convenient tool for the rapid assessment of reproductive state and stress response in cetaceans.

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Behavior and Group Characteristics Differ in Mixed-Species Associations (MSA) of Cetaceans in the Southern California Bight

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Effects of mixed-species associations (MSA [at least two different species swimming together and/or interacting]) on cetacean behavior rarely have been quantified, but are important for identifying and differentiating potential anthropogenic impacts. Baseline marine mammal behavior was assessed during 83,005 km of U.S. Navy supported aerial line-transect surveys in the Southern California Bight during 2008–2013. Multinomial logistic regression was used to assess effects of MSA on group size, maximum nearest neighbor distance (a “cohesion” index, in body lengths), behavior state, and heading. Two percent (50) of 2,536 sightings were MSA involving 13 species (5 baleen whales, 7 toothed whales, 1 pinniped). Behavior and group size of some species differed significantly in MSA vs. non-MSA. MSA were predominated by Risso’s dolphins (46%; 23 of 50 MSA). Risso’s dolphins were most frequently associated with bottlenose dolphins (35% of 23 Risso’s MSA groups) followed by northern right whale dolphins (NRWD; 2% of 23). Risso’s dolphins tended to change headings more often in MSA ($p < 0.10$), socially interacting by moving/orienting toward or away from other species. Notable MSA included a Risso’s dolphin chasing/charging a lone minke whale, a Risso’s dolphin repeatedly charging the heads of sperm whales that reacted by opening their mouths, and a mother/calf fin whale closely following/interacting with ~1,000 NRWD. Risso’s dolphin mean group size was significantly higher in MSA (26) vs. non-MSA (15). Group cohesion generally decreased in MSA vs. non-MSA but not significantly. Speculated explanations for the observed MSA include kleptoparasitism, feeding, defense of conspecifics, “floating maritories,” play, harassment, and social interest. Increased group sizes and tighter cohesion in MSA may indicate elevated defensiveness and/or facilitate social interactions. Interspecific interactions have remained historically uncommon in the SCB, but similar proportionally based on similar spatial/temporal effort (2–6%). MSA likely involve both benefits and risks to members, depending on species and motivations.

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SOUTHERN CALIFORNIA MARINE MAMMAL WORKSHOP

JANUARY 31 – FEBRUARY 1, 2014

• NEWPORT BEACH, CA •



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APPENDIX 1: POSTER ABSTRACTS

APPENDIX 2: EVALUATION FORM