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## **Review of Stress and the Measurement of Stress in Marine Mammals**

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### **LONG-TERM GOALS**

The goals of this review of stress are to provide for marine mammals a conceptual framework for considering stress, to use the framework to review previous studies of stress, and to suggest how to design studies that address questions about stress.

### **OBJECTIVES**

The objectives are to comprehensively review the literature on stress in cetaceans, stress in pinnipeds and stress in other marine mammals, and to devise and present a conceptual framework for considering stress in marine mammals that can be used by marine mammal researchers to consider how animals detect and respond to stressors over short and longer time periods.

### **APPROACH**

A comprehensive review of the published literature on stress will be performed. Definitions of stress used in different studies will be identified and related to a clear conceptual framework for the consideration of stress in marine mammals. Summary tables will be prepared to list, for each group of marine mammals, key features of all published papers. Reported values for cortisol concentrations will be summarised in tables with details of sample collection conditions in order to provide readily accessible information on mean values and ranges of measured cortisol concentrations in different situations. Measurements of Dr Cockrem will write the review.

### **WORK COMPLETED**

This work will be performed and completed in FY2013.

### **RESULTS**

Results will be available once the work has been completed.

## **IMPACT/APPLICATIONS**

There is currently no recent, authoritative review of stress in marine mammals available to the scientific community. The review will assist researchers to readily determine what work has previously been undertaken on stress in particular species and groups of marine mammal species, to pose questions in relation to clear definitions of stress, to determine how stress can be measured in their study animals, and to interpret results in relation to results from previous studies.

## **RELATED PROJECTS**

This review is related to two projects which include investigations of the measurement of stress via quantification of blubber cortisol concentrations. These projects are "Variability of hormonal stress markers collected from a managed dolphin population" and "Variability of hormonal stress markers and stress responses in a large cross-sectional sample of elephant seals".