

## Hawaii Fisheries Disaster Relief Program

# Final Report

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**2. Title of Project:** “What do sea turtles see and how can this be used to prevent their interactions with fishing gear”

**3. Fishery Targeted:** Hawaiian longline fleet but also any fisheries that might interact with sea turtles

**4. Award received:** US\$88,010

**Actual amount spent:** US\$88,010 (final amount likely to be higher due to exchange rate to AU\$, unknown until final invoice paid)

**5. Project Objectives:**

**Objective 1.** Determine the visibility of different colours to sea turtles (green, loggerhead and leatherback sea turtles)

**Objective 2.** Extrapolate findings to adult sea turtles by using anatomical and optical measurements as well as mathematical modelling

**Objective 3.** Determine the exact colour vision abilities, contrast sensitivity and the ability to detect flashing light of adult sea turtles

**6. Describe how the objectives were met.**

For Objective 1. field experiments were undertaken with hatchling green turtles (on Heron Island, Australia), loggerhead turtles (Mon Repos, Australia) and leatherback sea turtles (at St. Croix, US Virgin Islands). These travel and equipment expenses were spent as outlined in the contract. In the original proposal the fieldwork with leatherback sea turtles was planned to occur in Florida, however storms destroyed many nests shortly before my trip so the field trip location was changed to St. Croix at the last minute. My sincere thanks go to Drs. Jeanette Wynecken and Mike Salmon as well as private and government organisations in St. Croix for accommodating me at very short notice. We obtained detailed colour threshold responses from specimen of each species and these results are currently being prepared for publication.

For Objective 2. Anatomical and optical parameters were measured in locally sourced loggerhead and green turtle specimen and leatherback eye tissue (sourced from specimens that had died in longline bycatch in Canada). All salary and equipment funding was spent as outlined in the proposal. The leatherback sea turtle results have just been published (Brudenall *et al.*, 2008) and the results from other species are being prepared for publication.

**7. Discuss differences between work anticipated in your proposal and work that was actually completed.**

Objective 3 could not be met as no suitable material was available. As stated in the project proposal this objective was strongly dependent on suitable tissue availability sourced in close proximity of the equipment required to do the experiments (within the Brisbane region, Queensland, Australia). During the course of the project sea turtle tissue from freshly deceased turtles was not available. This part of the project had a very small budget for chemicals only.

**8. Discuss differences between expected and actual costs.**

Actual cost of the proposal was higher than the expected cost due to changed in the US\$ - AUS\$ exchange rate during the lengthy contract negotiations. I gratefully acknowledge the adjustments to my budget made by FDRP / JIMAR to compensate for some of the exchange rate shortfall. Also due to unforeseen weather impact the planned field trip to Florida had to be changed to take place in St. Croix, US Virgin Islands. The additional flight and accommodation costs could be covered by using funding dedicated to a fieldtrip to Hawaii which, as it turned out throughout the project, was not essential as material could be sourced in Australia.

**9. List all publications, posters, brochures, and other informational material published with project funding. Submit copies of publications to JIMAR**

***Journal Articles:***

A Southwood, **KA Fritsches**, RW Brill, Y Swimmer 2008. Sound, chemical, and light detection in sea turtles and pelagic fishes: exploring sensory-based approaches to bycatch reduction in longline fisheries. *Endangered Species Research* (in press).

D Brudenall, IR Schwab & **KA Fritsches** 2008. Ocular morphology of the leatherback sea turtle (*Dermochelys coriacea*). *Veterinary Ophthalmology* 11 (2), 99-110.

***Conference Presentations (talks):***

**KA Fritsches**. Ecology of Colour Vision in Large Pelagic Predators. American Fisheries Society 137<sup>th</sup> Annual Meeting 2-6<sup>th</sup> Sept 2007, San Francisco, USA.

**KA Fritsches**. Responses to light of different wavelengths in hatchling sea turtles. Vision Downunder Conference 19-22 July 2007, Cairns, Australia.