

## SHARK BIOLOGY AND CONSERVATION 11 MARCH 2008 ZSL SCIENTIFIC MEETING RESEARCH POSTERS PRESENTED

### **Methodological solutions for the determination of behavioural traits and their metabolic requirements in sharks**

*Adrian C. Gleiss\**, Samuel H. Gruber, Brad Norman & Rory P. Wilson

*\*Institute of Environmental Sustainability, Biological Sciences, Swansea University, Swansea SA1 8PP. E-mail: 323246@swan.ac.uk*

Elucidation of the behavioural ecology of elasmobranchs is essential to further our understanding of the role of these important animals in marine ecosystems and therefore facilitate their conservation. Although their cryptic life style complicates the collection of high-resolution data, the continual development of electronic "tags" is increasing our ability to gather such data. Here we present a new archival-tag measuring 13 parameters (tri-axial acceleration, tri-axial magnetic field strength and a suite of environmental factors) that is able to resolve both behaviour and associated energetic cost in sub-second resolution. Semi-captive trials were conducted on two lemon sharks (*Negaprion brevirostris*) in the Bahamas and two free-swimming whale sharks (*Rhincodon typus*) at Ningaloo Marine Park. Using acceleration traces, four behavioural traits could be distinguished and their relative energetic gain calculated. Overall dynamic body acceleration (ODBA), itself known to correlate with activity-specific metabolic-rate, showed a positive linear relationship with tail-beat frequency, indicating the potential for ODBA as a proxy for energy expenditure. Comparison of ODBA for four distinct behaviours revealed it to be highest during fast-start swimming, while the lowest ODBA was measured during resting phases. Notably, diving whale sharks exhibited descents with low ODBA, while ascents were characteristic of high ODBA. This is indicative of cost-efficient locomotion.

### **Are coastal sharks threatened by distant fishing pressure?**

*Jennifer Schultz<sup>1\*</sup>, Kevin Feldheim<sup>2</sup>, Samuel Gruber<sup>3</sup>, Mary Ashley<sup>4</sup> & Brian Bowen<sup>1</sup>*

*<sup>1</sup>Hawaii Institute of Marine Biology, University of Hawaii;*

*<sup>2</sup>Pritzker Laboratory, The Field Museum;*

*<sup>3</sup>Bimini Biological Field Station, University of Miami;*

*<sup>4</sup>Department of Biological Sciences, University of Illinois*

*\*PO Box 1346, Kaneohe HI 96744, USA. E-mail: jschultz@hawaii.edu*

Rapid decline in coastal shark populations has generated concern regarding their conservation status and the future of ecosystems where they serve as apex predators. Their depletion is attributed to the growing demand for shark fins and unregulated fishing. Some nations have implemented laws to manage these species on a local scale but recent studies indicate that coastal sharks may be capable of long-distance migration, even across oceans. We use genetic analyses to determine whether distant lemon shark populations are connected via migration. We find that lemon sharks travel up to 6000 km coastally. While movement across the Atlantic has occurred throughout the lemon shark's evolutionary history, there is no evidence for contemporary transatlantic migration. Therefore, over-fishing is likely to threaten coastally linked shark populations; transoceanic populations will not be similarly impacted and will not readily repopulate depleted stocks.

please contact Joy Hayward for further information:

joy.hayward@zsl.org

Joy Hayward, Scientific Meetings Coordinator, ZSL, Regent's Park, London NW1 4RY, UK.

## **The artisanal shark fisheries in the Andavadoaka region of southwest Madagascar: results from a year of catch monitoring**

Frances Humber<sup>1,2</sup> (Corresponding author), Brendan Godley, Alasdair Harris, Vola Ramahery & Annette Broderick

<sup>1</sup>Blue Ventures Conservation, 52 Avenue Road, London N6 5DR, UK;

<sup>2</sup>Marine Turtle Research Group, Centre for Ecology and Conservation, University of Exeter in Cornwall, Tremough Campus, Penryn TR10 9EZ, UK.

The nomadic Vezo of southwest Madagascar have a strong history of shark exploitation. Approximately 25 species of sharks and guitarfish are regularly fished, primarily to support a growing shark finning industry that is increasingly active in the region.

It is widely recognised that catches of both species groups are declining, however there are currently few viable alternatives available to local fishers and little research has ever been conducted to determine the extent of shark or turtle fishing in southwest Madagascar and the rate at which populations are declining. There is currently no legislation to regulate shark fisheries.

In October 2006 Blue Ventures initiated the first phase of a shark research and conservation programme in the region of Andavadoaka, southwest Madagascar. This research is monitoring the status and exploitation of the shark fisheries in 12 villages along 40km of coastline. These studies are working to identify which species are found in the region, collecting previously unknown biological information, and profiling the fisheries through socio-economic assessment.

The research programme has so far seen widespread support from local communities, and in the first year of monitoring the project has recorded over 1000 shark landings. It is estimated that over 25 species of shark have been caught, with *Sphyrna lewini*, the scalloped hammerhead, accounting for 33% of the catch.

The project aims to increase the knowledge base of shark fisheries along this larger stretch of coastline and develop a local and national framework for shark conservation and fisheries management.

## **The role of UK aquaria within global shark conservation**

Emma-Louise Nicholls, Department of Earth Sciences, University College London, Gower Street, London, WC1E 6BT, UK. E-mail: e.nicholls@ucl.ac.uk

The question of whether it is right to keep animals in captivity is as complex today as it was when zoos and aquariums first started steering away from the menagerie style collection of barred cages, and venturing towards natural-looking 'habitats' and enrichment exercises. Upon interviewing a number of zoo and aquarium staff for a book, the justification of animal collections comes in the form of public education and breeding programmes. Both highly commendable reasons, but when it comes to UK-based establishments, in which the majority of faunas are non-endemic, is their role in global conservation as prolific as they would have us believe?

Four major aquaria were studied for their role in global shark conservation; London Aquarium, National Marine Aquarium, Great Yarmouth Sea Life Centre and Blue Planet Aquarium. The results revealed a varied scale of levels of education and information available to the public that, without the input of the Shark Trust, would have been down to zero in the majority of cases.