Darwin Initiative for the Survival of Species

Half Year Report Form

Project Title	**Conservation of whale sharks and fish spawning aggregations in Belize**
Country	Belize
Organisation	University of York
Project Ref. No.	162/09/005
Report date	April-October 2002

1. Outline progress over the last 6 months against the agreed baseline timetable for the project.

Research:

Overall we are pleased and on-track with the results from this past whale shark season. We undertook three site visits of 10-16 days each around the full moon periods from late April to early July. The weather was unseasonably rough in April and June-July and unusually calm in May. In several instances conditions made diving or even reaching the study site impossible.

We recovered in late March a pop-off satellite tag that did not detach as programmed. It was cut off from the whale shark and sent back to the manufacturer for analysis (noted in annual report). Most fortunately, it was found to contain a full data set. We have analysed some of these data and now have the first and unique insights into whale shark diving behaviour every minute for 6 months. In total, 4 out of 11 satellite tagged whale sharks have yielded excellent usable data that show diel, lunar and seasonal diving patterns. Whale sharks are much more versatile physiologically than previously thought as they can withstand rapid and broad changes in pressure, temperature and oxygen availability while diving, possibly in the search of food. The satellite tags show that they are diving deeper than 1000m and possibly over 1,500 m according to the recovered tag, which is why the tag did not detach and the depth sensor broke. This beats their previous recorded deep diving record of 700m for this species set during the course of this project and may account for the failure of two other satellite tags that did not report.

Results from the work on site fidelity (co-funded by the Natural Environment Research Council) indicate that 77% of acoustically tagged sharks returned to Gladden Spit between the months of April and June and 45% returned between one year and the next. This indicates that Gladden Spit is a very important feeding ground for a high percentage of the visiting population of whale sharks and must be protected accordingly. These results and whale shark diving behaviour were presented at the European Elasmobranch Association conference in Cardiff 6-8 September 2002. The work was well received by peers in the field of shark research.

Fisheries landings data for the mutton snapper aggregation fishery was collected from April-June 2002 with Department of Fisheries staff, Friends of Nature staff, Darwin project staff, and a Darwin Project intern from the University of York. We have analysed the data and show that over the study period of 2000-2002 there is a significant decline in both the mean fish length of snappers caught at the aggregation and in the amount caught per amount of effort expended. This indicates that conservation measures are

needed to protect this spawning aggregation. These results will be presented to the fishers and managers of the marine reserve in December 2002 or January 2003.

Education and institutional strengthening:

We are fortunate that Friends of Nature hired a dedicated biologist for the Gladden Spit Marine Reserve, Roberto Pott. We incorporated Roberto into our team during parts of the April and May field trips. Both Roberto and two of Friends' new marine reserve rangers learnt how to record fish landings and tourism information. We will be teaching Roberto how to tag and identify whale sharks and going over analysis techniques when we return to the site during March-April 2003.

A group of ten Belizean students were set to participate in project work in March 2002 but opted for another two-week course. It was not possible to reschedule them due to clashes with University courses and lack of space on the successive field trips. Plans have been made to involve and train three students in plankton work (what the whale sharks feed on when not feeding on fish spawn) during the project's remaining field trips in 2003.

Outreach and information dissemination:

We continued to disseminate brochures on whale shark biology and the code of conduct for interacting with sharks and give talks to tourists. RTG gave a talk to University of Belize students on marine and shark conservation and presented results from the pilot tourism survey of 2001 at two workshops that included local tour-guides, fishermen, conservationists and local NGO representatives.

We published a popular article in the local paper that is read by most tour-guides and tourists in the Placencia area during the whale shark season.

We gave a radio interview profiling the research and its results and working in Belize to the London Radio Service. This programme is broadcast worldwide.

A paper was presented at European Elasmobranch Association's Conference in Cardiff (6-8 September) that has formed the basis of three potential collaborations with other shark researchers.

The project and research have generated good media publicity, particularly in the light of the Sustainable Development Summit in Johannesburg (August 2002). These include:

- London Radio Service – 10 minute programme on the sharks and the research for dissemination worldwide (September 2002)
- Yorkshire Evening post (regional paper) – 30 August, 2002
- Evening Press (regional paper) – 30 August and 3 September 2002
- Daily Express (national paper) – 7 September 2002
- BBC web (international) – 11 September 2002 "Whale sharks prove egg lovers"

We also worked with a BBC film crew in April to raise the profile of sharks in a special on shark intelligence to be aired in 2003. They focused on the whale shark's ability to time its arrival to Gladden Spit to its food source, the spawn of aggregating snappers.

We shared lessons learnt and knowledge on tagging methods with a Wildlife Conservation Society shark specialist who visited our project for 7 days in May. He subsequently went on to successfully deploy satellite tags on white sharks in South Africa.

A hat was designed and produced to raise awareness of whale shark research, Darwin support in Belize, and project partners' involvement. These were distributed to all

project partners including the Minister of Agriculture and Fisheries, the Fisheries Department Administrator and Heads of the Coastal Zone Marine Authority and Research Institute.

Conservation policy:

The most positive news on conservation policy came when the Department of Fisheries signed a co-management agreement with the Friends of Nature, making them the organisation responsible for the Gladden Spit Marine Reserve. With this agreement in hand and strong financial backing from several funding agencies Friends can work on conservation and education issues at Gladden. Unfortunately, the whale shark guidelines drafted to regulate tourism at Gladden Spit Marine Reserve have still not yet been gazetted and therefore have still not been implemented. However, the mayhem at the spawning ground observed with tour-boats this year may have been the cause of the drastic decrease in the predictable sighting of sharks and fish. This wake-up call should help ensure that the regulations are implemented this coming year.

Belize may provide strong support for whale sharks being placed on the Appendix II of Convention on International Trade in Endangered Species of Flora and Fauna (CITES) during it s biennial conference to be held in Chile in November.

Collaborations:

Concrete collaborations have been possible in the past 6 months with the Friends of Nature following the hiring of a dynamic new executive director, Lindsay Garbutt, and biologist Roberto Pott (see note on biologist and ranger involvement in research above).

The Texas Flower Garden Banks National Marine Sanctuary (FGBNMS) Research Coordinator recently sent some images of whale sharks sighted at their marine reserve in early October to investigate a possible match with sharks we have identified at Gladden. The photos were sent in as a result of the information request poster placed on all vessels visiting the FGBNMS. Sightings were also called in from Mexico in September but no photos were taken so matches will not be possible. However, we already know from previous resightings of Belize tagged sharks that whale sharks travel to the Yucatan peninsula.

2. Give details of any notable problems or unexpected developments, that the project has encountered over the last 6 months. Explain what impact these could have on the project and whether the changes will effect the budget and timetable of project activities. Have any of these issues been discussed with the Department and if so, have changes been made to the original agreement?

Research:

The positive unexpected development of the season was the retrieval of the satellite tag that has yielded a minute-by-minute data on temperature and depth the whale shark was diving to over the course of 6 months. This unique information provides us with a unique picture of the whale shark's diving and foraging behaviour.

The less positive development of the season was the surprise lack of predictable aggregating behaviour for 6 days during the peak snapper spawning-period. This may have been due to the significant increase in tourist boats and divers visiting Gladden Spit in search of whale sharks. Their presence may have disrupted fish behaviour and constrained spawning which in turn alters the whale sharks' predictable daily surface-feeding behaviour. Also due to this change in behaviour and unseasonably rough

weather we were not able to tag many sharks this year or teach the biologist and rangers how to tag and identify sharks. We are hoping to accomplish this in March and April 2003.

Institutional aspects and policy:

Rapid strengthening of Friends of Nature through the hiring of a full staff and opening of their new office. With staff on board and the purchase of two boats they are now in a position to enforce marine reserve regulations eg. Whale shark tour regulations once these are gazetted. Most of their strengthening was due to help from privately funded consultants who helped them develop strategic and management plans. The Darwin Project helped to introduce the biologist and two of the rangers to the Gladden Spit site and fauna and provide them with some of the skills necessary for future monitoring of fish and whale shark populations.

3. Are there any other issues you wish to raise relating to the project or to Darwin's management, monitoring, or financial procedures.

There are no other issues to address at this time.

Completed forms to: Rose Clarkson, Darwin Initiative M&E Project Manager, John Muir Building, Kings Buildings, University of Edinburgh, Mayfield Rd., Edinburgh EH9 3JK, Scotland. Email: R.Clarkson@ed.ac.uk