Darwin Initiative Annual Report

Important note:

To be completed with reference to the Reporting Guidance Notes for Project Leaders: it is expected that this report will be about 10 pages in length, excluding annexes

Submission Deadline: 30 April 2011

1. Darwin Project Information

Project Reference	18-016
Project Title	Darwin Initiative to Enhance an Established Marine Protected Area System
Host Country/ies	Cayman Islands
UK contract holder institution	Bangor University, Wales (School of Ocean Sciences) SOS
Host country partner institutions	Cayman Islands Government (Department of Environment) (DOE)
Other partner institutions	The Nature Conservancy, USA (TNC)
Darwin Grant Value	£273,914
Start/end dates of project	April 2010 – March 2013
Reporting period	1ST April 2010 to 31st March 2011 Annual report No. 1
Project Leader name	Dr. John Turner, Bangor University
Project website	www.caymanbiodiversity.com
Report authors, main contributors and date	John Turner, Laura Richardson and Croy McCoy 30th April 2011

2. Project Background

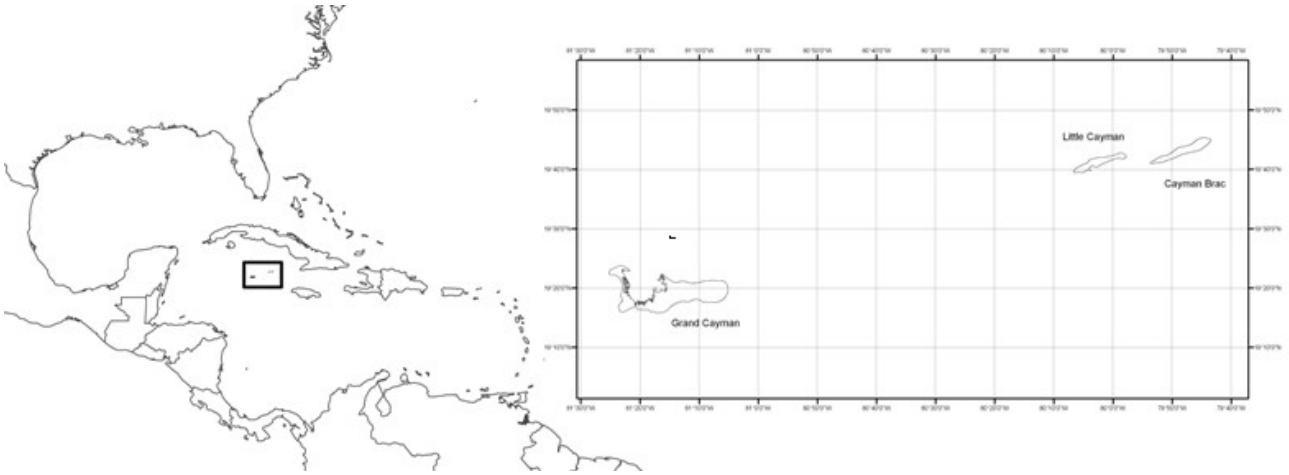

Figure 1 The Cayman islands of Grand Cayman, Little Cayman and Cayman Brac in the Caribbean

The Cayman Islands

The Cayman Islands are a UK Overseas Territory located centrally in the Caribbean (Grand Cayman 19° 20′ 0″ N, 81° 13′ 0″ W; Little Cayman 19° 41′ 0″ N, 80° 02′ 0″ W; Cayman Brac 19° 43′ 0″ N, 79° 48′ 0″ W; Fig. 1), with strong financial and tourism sectors, and negligible industry, run off or agricultural impact. The islands present a rich marine environment, seemingly benefiting from over two decades of world-class *in situ* conservation through the active enforcement of zoned Marine Protected Areas (MPAs).

Key issues addressed

The islands are subject to hurricanes, and coastal protection is paramount to island security, for 90% of the population live within one mile of the coast. Climate change impacts including increased storm frequency, coral bleaching, sea level rise and ocean acidification, combined with increased tourism, coastal developments, and a growing artisanal/recreational fishery are impacting coral reefs and associated ecosystems. There is an urgent need to review the MPAs, to ensure that the system maintains the capacity of the reefs to recover from major damage, and to protect reef associated ecosystems such as pelagic ecosystems, seagrass and mangroves, seabirds, reptiles and mammals, and thereby to address Cayman's obligations under CBD.

Background

Strict Marine Reserves were established in 1986 under the Cayman Islands Marine Conservation Laws of 1978, with Marine Park Zones primarily to control recreational diving, anchoring and fishing close to the major resorts. These zones were complemented by No Diving Zones, and Grouper Spawning Areas, and additional zones have been added in response to specific issues; Wildlife Interaction Zones (swimming with stingrays) and Replenishment Zones. Closed seasons and catch limits operate for lobster, conch and whelks, and fishing and other activities require permits. MPAs currently cover 16.7% of the shelf of the Cayman Islands.

The resident human population and visitors have increased significantly since MPA establishment (by 150% and 425% respectively) and half of visitors dive on the reefs. Recent changes in building legislation are resulting in redevelopment with taller buildings and larger footprints fronting the Marine Park. Further, in the wider Caribbean, disease induced mortality of the keystone grazing urchin *Diadema*, and the near complete die-off of Elkhorn and Staghorn coral have also affected Caymanian reefs. Widespread overfishing, especially of herbivores; reduction in water quality from land based pollution; and coral bleaching, have accelerated degradation, resulting in reefs phase shifting from coral to an algal dominated state.

In the context of these local development and regional changes, and increasing risk from climate change impact, the Cayman Islands Government acknowledges that a review of the MPA system is urgently necessary, to assess whether MPAs are optimal in area, appropriately located, and provide maximum resilience. To date, the Government Department of Environment (DOE) has diligently maintained and monitored the MPAs, and, despite identifying the urgent need to review the system to address development and climate change, has insufficient resources to scientifically assess their effectiveness to make an informed case for their expansion. The project seeks to create an enhanced MPA system that would demonstrate globally what far-sighted *in situ* conservation can achieve in building resilience back into ecosystems.

This current project builds on the results of Darwin Project 14-051: *In Ivan's Wake - Darwin Initiative BAP for the Cayman Islands*, Government of Cayman Islands and University of Exeter in Cornwall. Species specific plans are documented in the Darwin Initiative National Biodiversity Action Plan developed under this previous Darwin Project (Ref. 14-051).

Project aims

1. **To assess the current level of reef resilience within and outside all marine protected areas of Grand Cayman, Little Cayman and Cayman Brac;**
2. **To examine representativeness and variation by utilising mapped reef and associated ecosystem habitats;**
3. **To assess overspill of fish biomass from all No-Take zones;**
4. **To quantify the impact of the artisanal/recreational fishery;**
5. **To use the data from 1-4 to plan and promote an extension to the MPA system with full public consultation and involvement from stakeholders (represented by the Marine Conservation Board/Watersports Association/District Communities).**

Objectives 1, 3 and 4 are being completed by the DOE in partnership with Bangor University (School of Ocean Sciences; SOS). The methodology involves coral reef (Annex, abstract 1) and fish surveys (Annex 3, abstract 2) developed by McCoy & Turner between 2007-2009, and socioeconomic survey methodologies first tested by an SOS team in 2009 (annex 3, abstract 3). Objective 2 will use habitat maps from Darwin 14051, & TNC's Ecological Gap Analysis and Protected Area GIS Tools (Annex 3, Abstract 4). Objective 5 will be led by DOE senior staff (supported by SOS/TNC) since local leadership and government representation are required.

3. Project Partnerships

This project builds on collaborative pilot studies undertaken the Cayman Islands Government Department of Environment (DOE) and Bangor University (SOS) and a PhD study (McCoy, DOE) on monitoring Caymanian coral reefs in MPAs. It also builds on a developing relationship between DOE and The Nature Conservancy (TNC) *Caribbean Challenge*.

The core project team is comprised of John Turner (Project Leader, Bangor University), Gina Ebanks-Petrie (main Project Partner and Host-country Co-ordinator, DOE, Cayman Islands Government), Croy McCoy (Darwin Fellow, DOE), and James Byrne (Regional Partner, TNC, USA). The roles and responsibilities of each collaborating partner are:

- School of Ocean Sciences, Bangor University, UK (Lead UK institution)

  This is a research led university school providing academic input in survey design and analysis, marine field research, project co-leadership, financial management, monitoring and evaluation and research publication in high impact international scientific journals. The School has developed a working relationship with the Cayman Island Government Department of the Environment (DOE), and this Darwin project has arisen out of active research collaboration on monitoring coral reefs in the Marine Protected Area system. The Project is co-led from Bangor (Turner). Laura Richardson has been employed by Bangor University as a full-time Darwin Research Fellow in the Department of the Environment, Cayman Islands for 2011-2013. Additionally, Turner provides PhD supervision for a member of DOE (McCoy) and leads an international postgraduate Masters course in Marine Environmental Protection providing training and UK MSc project students to collaborate with DOE and assist in field research.

- Cayman Islands Government Department of Environment (Lead Host-country Partner)

  The Department of the Environment (DOE) is under the Cayman Islands Ministry for Tourism, Environment, Investment and Commerce (TEIC). The DOE is the main Government agency responsible for the management and conservation of the environment and natural resources and plays a key role in liaising with government and major stakeholder groups represented by the Marine Conservation Board, Watersports Association and district communities. DOE works to facilitate responsible management

and sustainable use of the natural environment and resources of the Cayman Islands through various environmental protection and conservation programmes and strategies. DOE manages the marine protected area system across all three islands and provides field operational capacity for research and enforcement: 15 staff in research and assessment staff (7 marine); 19 staff in enforcement and operations (12 Conservation Officers); 4 administrative staff; and operates 7 research boats and 6 enforcement boats. DOE has the institutional and legal structure to implement the project in the field, but does not have the financial resources and research focus to undertake a scientific assessment of the current MPA system and enhancement planning initiative, while maintaining existing programmes of necessary monitoring and enforcement. However, it is important that DOE lead the stakeholder consultation and district community consultation. The project involves 10 DOE staff on 10-100% time, of which 3 staff (Darwin Research Officer Fellows) > 50% time: McCoy 100%, Chin 75% and Gibb 50%). The Director (Ebanks-Petrie) co-leads the project.

- The Nature Conservancy, USA (Project Partner)

  The Nature Conservancy is the leading US conservation organization working around the world to protect ecologically important lands and waters for nature and people. Its *Caribbean Challenge* Program will result in a wholesale transformation of countries' national park systems and will nearly triple the amount of marine and coastal habitat currently under protection, setting aside almost 21 million acres of coral reefs, mangroves, sea grass beds and other important habitat for sea turtles, whales, sharks and other wildlife. Cayman is shortly to join other countries and territories in the *Caribbean Challenge*. TNC will continue to have a major role post Darwin project. The three core components of the Challenge include:

  1. creating networks of marine protected areas expanding across 21 million acres of territorial coasts and waters;
  2. establishing protected area trust funds to generate permanent, dedicated and sustainable funding sources for the effective management, expansion and scientific monitoring of all parks and protected areas;
  3. developing national level demonstrations projects for climate change adaptation.

  Through collaboration with the UK Darwin Initiative, TNC has this year developed a Cayman specific *Ecological Gap Analysis* (http://www.cbd.int/protected/gap.shtml), and has started to use habitat mapping data to examine the goals and constraints of an extended marine protected area using *Marxan* conservation planning software (University of Queensland http://www.uq.edu.au/marxan/) and specifically, the *Marzone* tool (http://gg.usm.edu/pat/). TNC first began working with DOE in July 2008 with an initial visit by James Byrne (TNC Marine Science Program Manager), followed up with a weeklong *Marxan* training in February 2009 by Steve Schill (TNC Principal Mapping Scientist and Senior Scientist) focusing on mapping risks and potential protected areas for terrestrial systems. Since the start of the project, Schill's involvement with the Darwin project has developed and he is now principally responsible for DOE *Marxan* training and the application of the software for *Ecological Gap Analysis* and conservation planning, working closely with Jeremy Olynik. (Annex 3, Abstract 4)

There have been no major changes to the management structure of the project during this first year reporting period, though at the end of this reporting year, Laura Richardson was employed as an additional member of UK personnel, in the role of Darwin Research Fellow (Project Support Officer). She will work full time in DOE, Cayman Islands (from 1st April 2011), to complement DOE staff (especially McCoy) working on the project, with responsibility for field work planning, workshop and community meetings organisation, project data management, media liaison, and output preparation. Laura has a BA Hons in Social Anthropology with

Development Studies (University of Sussex), an M.Sc. with Distinction in Marine Environmental Protection (Bangor University), and experience in conducting research on the effect of MPAs on coral reef resiliency, and in stakeholder liaison.

The core team are in regular contact via email or Skype and also work closely on the ground. Communications between John Turner in the UK and those based in the Cayman Islands (most regularly McCoy and Richardson) are largely by bi-weekly and sometimes daily email or Skype instant messenger. Communications between project staff in the Cayman Islands are generally by regular emails or face-to-face meetings. Research project progress meetings are held monthly at DOE, which do not include John Turner but do include all research management personnel from DOE, including Phil Bush, Secretary of the Cayman Islands Marine Conservation Board. These meetings discuss progress of all current projects (in addition to this Darwin project). John Turner visited DOE, Cayman Islands in September and October to attend management meetings and to discuss project progress. He has a further 4 visits scheduled for the next year/reporting period (June, September, October, January 2011 - 2012).

Support provided to the project by the partnership between DOE and regional partner TNC has been strong and well developed in this first reporting period. James Byrne has visited the Cayman Islands for management meetings coinciding with John Turner's visits, and remains in regular contact with key project staff. Steve Schill's enhanced role in the project since October 2010 (Q2) has facilitated 2 visits to DOE to conduct training sessions with DOE staff (Jeremy Olynik GIS Officer DOE) and builds on an existing working relationship with DOE (Annex 3, Abstract 4).

At the end of the first year, the partnerships are demonstrably strong, with significant project progress having been made across the board. The partnership builds on an existing collaboration between SOS Bangor and DOE (since 2004) monitoring Caymanian coral reefs in MPAs, and has been strengthened in this first year of the project, facilitated by weekly (sometimes daily) communications (email, Skype) between Turner and McCoy and 14.5 months UK personnel time in the Caymans during this period.

In this first year, four people were employed by SOS Bangor to build its own capacity and to undertake specific tasks in the field, prior to the appointment of the Darwin Project Support Officer. These were:

Natasha Pisani M.Sc. (SOS Bangor) – Fish Biomass assessment and Reef resilience assessment, Grand Cayman

Rhiannon Meier M.Sc. (SOS Bangor) – Recreational/artisanal fishing pressure assessment

Laura Richardson M.Sc. (SOS Bangor) – Reef resilience assessment: algal biomass

Monique Grol (Netherlands Intern / SOS Bangor) - Fish Biomass assessment, sister islands.

In addition, *Charlotte Dromard* assisted in fish biomass surveys as a DOE intern from the University of Gaudaloupe, and two students completed MSc research project studies within the project structure:

Jess Campbell: Recovery of Caymanian reefs after a coral bleaching event. *MSc thesis, University of Bangor*. 89p. (Annex 3, Abstract 5)

Adam Barton: An assessment of Caymanian coral reefs: are the long established marine no take zones enough. *MRes Thesis, University of St Andrews.* 102p. (Annex 3, Abstract 6)

Two further students (Katie Hillyer and Elayne Looker) are due to undertake projects on further reef resilience aspects during June-July 2011, specifically on coral colony size and community structure, and coral disease.

Sarah Gall and Beth Henshall from Bangor undertook MSc studies in 2009 (Annex 3, abstracts 7 & 8) within the DOE-Bangor collaboration prior to the Darwin Initiative project, but their work formed the basis of underwater video surveys (Gall) and fishery questionnaire surveys (Henshall) for the Darwin Project.

A project management meeting was held in September 2010 at DOE (including DOE, SOS and TNC) to review the Biodiversity Action Plan and Coral Reef and Lagoon Habitat Mapping produced by Darwin Project 14-051: *In Ivan's Wake - Darwin Initiative BAP for the Cayman Islands*, Government of Cayman Islands and University of Exeter in Cornwall. This meeting was valuable, providing a link between the two projects.

OTEP (Overseas Territories Environment Programme) and JNCC (Joint Nature Conservation Committee) initiatives on invasive species in UK OTs and specifically the Cayman Islands, are managed by DOE, but their relevance is restricted to lion fish eradication. Darwin project field work for assessing fish biomass this year has been shared with field work efforts for these initiatives.

Since 2008, REEF (Reef Environmental Education Foundation www.reef.org), DOE and Oregon State University (OSU) have been working to develop a collaborative conservation programme on Nassau groupers (*Epinephelus striatus*) as part of the Grouper Moon Project in the Cayman Islands. The funded research, broadly titled as "The reproductive biology of remnant Nassau grouper stocks: implications for Cayman Islands Marine Protected Area (MPA) management" aims to evaluate the potential for spawning site MPAs to recover Nassau grouper stocks. This research was funded by a grant from the Lenfest Ocean Program at the Pew Charitable Trusts and expanded on the initial findings of an Acoustic Research Project that was started in 2003. It is anticipated that the results of this research pertaining to MPAs evaluation and enhancement will feed into the Darwin project, especially as the Grouper spawning aggregation sites are a key management issue.

A new collaborative research component is currently being developed (at the end of this reporting year) with Dr Andrew Baker of the Rosenstiel School of Marine and Atmospheric Science, University of Miami, to investigate hard coral connectivity between islands, deep and shallow reefs & protected and unprotected sites. The activity will involve collecting 15-30 biopsies of coral tissue from 2 species of coral from two depths and from sites on one island, and from a site on each sister islands.

The DOE is the CBD/CMS/CITES focal point for the Cayman Islands.

DOE has to date maintained and monitored the MPAs most effectively, but this Darwin partnership is providing the opportunity and capacity to review the MPA system to address development and climate change. By attempting to enhance and increase the current MPA system coverage from 16.7% to at least 30%, the project partnership is helping the host country institution to address the following priorities of the CBD:

1. Promote conservation of the biological diversity of marine ecosystems, habitats and biomes
2. Promote conservation of species diversity in the marine environment.
4. Promote sustainable use and consumption
5.1. Decrease the rate of loss and degradation of natural marine habitats
7.1. Maintain and enhance resilience of components of marine biodiversity to adapt to climate change
8. Maintain capacity of ecosystems to deliver goods and services and support livelihoods
11. Improving financial, human, scientific, technical and technological capacity to implement CBD.

4. Project Progress

Project progress has been excellent and is on or ahead of schedule towards achieving the planned outcomes (see next section). The purpose level assumptions still hold true and the indicators remain adequate for measuring proposed outcomes (Annex 1 log frame).

4.1 Progress in carrying out project activities

Activities 1.1 - 4.1 set for year 1 (quarter, Q1-4) have all been addressed as follows:

Output 1: Map the reef and associated subtidal ecosystem habitats around the islands to assess habitat variation and examine representativeness

Indicators for Output 1: *Marine Habitat classification and GIS from Darwin project 14051. Additional data from satellite, in situ acoustic surveys (multibeam) and Groundtruthing surveys from TNC Caribbean Challenge).*

Means of Verification of Output 1: *Accuracy assessment conducted under Darwin 14051 and by DOE. Additional assessment necessary to identify any change resulting from October 2009 bleaching event.*

Important Assumptions for Output 1: *That temperatures cool in November (2009) and that bleached corals recover rather than display mass mortality (signs of recovery are apparent).*

The impact of the bleaching event of September 2009 was assessed by Jess Campbell in June-July 2010, and no mass mortality resulted, although bleaching had different effects around each island. No additional assessment beyond this survey at 55 sites around the three islands was therefore considered necessary: Campbell, J. (2010). Recovery of Caymanian reefs after a coral bleaching event. *MSc thesis, University of Bangor*. 89p. (Annex 3, Abstract 5).

Progress in carrying out Activities in Output 1:

1.1 Steering Group Meeting 1 to Establish Darwin project was held on 30th August 2010 at DOE (Gina Ebanks-Petrie, Tim Austin, Dr John Turner, Croy McCoy, James Byrne present) during which the following were discussed: steering committee composition and role; links and lessons from previous Darwin project; Darwin Initiative requirements reported by John Turner from the Darwin initiative Project Leader's workshop of 30th March London; review of overall objectives, log frame, activities, work plan and metrics; training and involvement by DOE staff and postgraduate students; post of Project Support Officer, the budget; publicity; and plans for the first Marine Conservation Board Stakeholder meeting.

1.2 Stakeholder meeting 1: Marine Conservation Board was held on 3rd September 2010 at DOE (Phil Bush (Chair), Richard Flowers, Capt. Chuckie Ebanks, Kenny Ryan, Bernard Watson, Bruce Eldemire, Capt. Andrew Pierson, Tim Austin, Dr John Turner, Croy McCoy) during which Turner and McCoy presented the Darwin Initiative, the objectives of this project, preliminary and underpinning results from pilot studies, and engaged the Board through consultation and ideas for participation.

1.3 The Marine Habitat Classification and GIS were reviewed on 6 September 2010 in DOE by DOE staff, current project and previous project (14-051) personnel in Grand Cayman (Ebanks-Petrie, Austin, McCoy, M. Cottam, J. Olynik, and Turner and with Byrne –TNC). The habitat mapping, based on ortho-corrected aerial mapping from 2004 and 2008 provided a robust classification for lagoons and shelf areas for each of the three islands, supported by an independent accuracy assessment. The Biodiversity Action Plans (BAP) for 18 marine habitats (eg sea grass areas, coral reef) and species were reviewed. It was agreed to aim to extend 'No Take Zones (including Wildlife Interaction Zones) from 16.7% to 50% of the shelf of Cayman, and to ensure that the extended zones protect fish on reef walls and incorporate grouper spawning aggregation sites, which will require new bathymetric limits to the zones. It was agreed that the timing of the project is appropriate to inform the National Conservation Bill in these respects, and the Bill will strengthen Marine Conservation Laws.

1.4 Assess existing long term data sets (Photo image data sets from Ogden (1976) and permanent photo quadrats by McCoy for 1997 and 2004 were identified as suitable raw data sets for analysis. Some early qualitative analysis was undertaken by Gall (Bangor) (Annex 3, abstract 7).

1.5 Initial Ecological Gap Analysis assessment (EGA) was conducted during the Marine Conservation Workshop 1 between 6-16th April 2010, lead by Steve Schill (TNC) collaborating with Jeremy Olynik (DOE GIS Officer). (Annex 3, Report Abstract). The focus was Grand Cayman. The objectives included: Finalizing the project extent, marine strata, and planning units; creating a marine environmental risk surface; compiling a list of biodiversity conservation features (targets) and associated conservation goals; training personnel in the use of the latest Marxan support software; and drafting and reviewing preliminary conservation portfolios . In addition Olynik attended the ESRI Users conference in July 2010 in San Diego for additional training in GIS tools, and Austin and McCoy attended the TNC Reef resilience workshop in June 2010 at TNC, Key Largo, Florida.

1.6 Steering Group Meeting 2: held 6th September 2010 at DOE (EBanks-Petrie, Austin, McCoy, Olynik, Cottam, Byrne, Turner) finalised the research objectives and methodologies.

In addition, the project was presented to a DOE staff meeting on 8th September 2010, to all scientists, enforcement officers, and support staff, and with Ministerial representatives present. Turner and McCoy explained the objectives of the Darwin Initiative, described the project and activities, and presented preliminary results. The main objective was to be inclusive and encourage involvement and participation in the project at all levels.

Further, the Governor of Cayman Islands Mr Duncan Taylor hosted a reception at the Governors Residence on 26th October 2010. Presentations by Mr Duncan Taylor, Governor, Ebanks Petrie (DOE), Turner (PL -SOS Bangor), and James Byrne (TNC) (Annex 3, 9) were followed by a media day, during which press and television interviews were given (see Dissemination section for web sites for further verification).

Progress towards project outputs

All activities planned for Q1 were successfully completed and Output 1 has been completed in full. The main output is a Geographical Information System at DOE, based on accuracy assessed habitat maps, and linked via GIS tools to Marxan Marine Protected Area planning tools. Although initially based on Grand Cayman, Gap Analysis and Marine Environmental Risk Surface are now complete for the Sister islands. In addition, the project was launched In Grand Cayman by the Governor, Mr Duncan Taylor, with local press and television coverage, and press coverage in the UK.

Output 2: Assessment of the current level of reef resilience within and outside the Marine Protected Areas of Grand Cayman, Little Cayman and Cayman Brac, and an assessment of the extent of overspill of fish biomass from the No Take Zones into surrounding zones
Indicators for Output 2:
Measures of: Coral cover, Coral species abundance, Calcareous and fleshy macroalgae, Coral recruits, Frequency of coral diseases and bleaching; Frequency of Herbivorous fish; Quantification of other impacts eg anchoring damage. Report to DOE / papers.

Means of Verification for Output 2
Reef survey at 55 established permanent sites around islands using visual census and video techniques. Comparisons with old data and photographs for some sites from 1970s and 1980s (source Ogden). Comparisons with permanent photo quadrats from early 2000s by McCoy.

Statistical comparisons with video and visual census by Gall, McCoy & Turner, 2009 (Annex 3, abstract 1) Use of experienced team with species specific knowledge, and training for junior members

Sites and techniques already established and old data and photographs archived, so no expected problems. New video data archived.

Important Assumptions for Output 2:
Bleaching event October 2009 means early comparison with pre bleaching survey of July 2009 essential.
Will require additional training of junior staff in DOE to provide appropriate dive team size to satisfy health and safety requirements and ensure future monitoring capability. Assisted by MPA Darwin Fellow and Bangor MSc project students

Assumes enforcement ensures No Take Zones are not transgressed.

Progress in carrying out Activities in Output 2:

2.1 Reef resilience field training and surveys: Reef resilience video & photo surveys were conducted at 55 permanent sites within and outside of Marine protected areas on Grand Cayman, Little Cayman and Cayman Brac during June to August, 2010, lead by McCoy, assisted by Natasha Pisani (Darwin Field support Officer from Bangor) and training was provided for DOE staff (Gibb and Chin), MSc research project students Jess Campbell (Bangor) and Adam Barton (St Andrews). 2 MSc dissertations produced: Campbell, J. (2010) Recovery of Caymanian reefs after a coral bleaching event. *MSc thesis, University of Bangor*. 89p; and Barton, A. (2010) An assessment of Caymanian coral reefs: are the long established marine no take zones enough?. *MRes Thesis, University of St Andrews.* 102p. (annex 3, abstracts 5 & 6). The Campbell thesis was also presented as a poster at Reef Conservation UK, December 2010. (Annex 3, abstract 10).

Algal biomass surveys were conducted at selected sites on Grand Cayman between November and December 2010 by McCoy and Laura Richardson (Bangor Field Support Officer). Results are under analysis, and an abstract has been accepted for a poster at the Association of Marine Laboratories of the Caribbean Meeting, 23-28 May, 2011 in Costa Rica (Annex 3, abstract 11)

2.2 Fish biomass field training and surveys: Fish biomass surveys within and outside MPA at selected sites on Little Cayman and Cayman Brac were completed between March and May 2010, (to complete earlier pilot survey which was conducted on Grand Cayman only). The surveys were lead by McCoy, with training for Charlotte Dromard (Intern, University of Gaudaloupe) and Natasha Pisani (Field Support Officer Bangor).

The fish biomass surveys were repeated at sites on Grand Cayman, Little Cayman and Cayman Brac between January and March 2011, lead by McCoy, with training for Monique Grol (University of Netherlands intern and Bangor Field Support Officer) and DOE staff Gibb and Chin.

To date, the fish biomass surveys have been presented at the Gulf of Caribbean Fisheries Institutes Annual Meetings:
McCoy, M., Dromard, C., Turner, J.R. (2009). An evaluation of Grand Cayman Marine Protected Area Performance: a comparative study of coral reef fish communities. Proceedings of the 62nd GCFI Gulf and Caribbean Fisheries Institute, Cumana Venezuela.(Annex 3, abstract 2)
Dromard, C.R., McCoy, C., Turner, J. R. (2010) *Evaluation of marine protected area's performances: the case of Little Cayman and Cayman Brac, Cayman Islands*. GCFI San Juan, Puerto Rico 1st -6th November 2010. (Annex 3, abstract 12)

2.3½ year reports Darwin Initiative (submitted October 2010).

2.4 Stakeholder meeting 2: Marine Conservation Board: to promote results illustrating the benefits of the MPA system, and to identify threats was combined with the meeting held on 3rd September 2010, (since it involved flying stakeholders in from sister islands, and preliminary results were already available from pilot studies). Major Stakeholder concerns on Marine Conservation Board identified were: Grouper fishing on Little Cayman and need to further protect Grouper spawning aggregation sites; illegal fishing from shores at night and in MPA at night; need for increased enforcement and prosecution; protection of channels at East end, where reef has eroded.

2.5 Reef resilience survey 2: Scheduled July August 2011.

2.6 Fish biomass survey 2: Scheduled August –September 2011.

2.7 ½ year report to Darwin Initiative and Final report on Benefits of extended MPAs: Due October 2011.

Progress towards project outputs

Output 2 is on schedule with all tasks in year 1 completed as proposed, and preliminary results disseminated at regional and UK scientific meetings (verification via abstracts provided).

Output 3: An assessment of the artisanal/recreational fishery

Indicators for Output 3

Socio-economic questionnaires directed at recreational fishers (visiting piers, and via patrol boat), tourists in departure lounge at airport and via hotel excursion operators, diving operators, charter boat skippers, and migrant workers. Report to DOE.

Means of Verification: *Unbiased questionnaires and recorded interviews analysed from representative cross section. Questionnaires tested and trialled in 2009 by Henshall, McCoy & Turner (Annex 1, abstract 3).*

Important Assumptions for Output 3:
May not get honest answers when recreational fishers approached in patrol boat, but in general, such fishers are compliant.
Honesty and safety will be issue when interviewing migrant workers (mostly Jamaican & Pakistani) who tend to fish late evening/night.

Progress in carrying out Activities in Output 3:

3.1 Socioeconomic assessment of artisanal and migrant worker fishers and
3.2 Socioeconomic assessment of recreational fishers

Activities 3.1 and 3.2 were completed by Rhiannon Meier (Bangor Field Support Officer) with support from Laura Richardson (Darwin Project Support Officer), and DOE Enforcement staff during February and March 2011 on Grand Cayman, Little Cayman and Cayman Brac.

A total of 275 resident questionnaires were conducted on Grand Cayman from 29th February – 30th March 2011, 264 of which were used for analysis for fisheries quantification. The 11 questionnaires that were excluded from further analysis were those not deemed reliable after the face-to-face survey using a pre-determined criterion. All completed questionnaires were used for analysis of fishers' opinions on the marine environment and the current management system. A total of 63 resident questionnaires were conducted on Cayman Brac between the 6th–11th February 2011, 62 of which were used for further analysis. The two questionnaires not incorporated into analysis were conducted with fishers who were either not happy to engage in the survey, or from a source that was not deemed reliable by the analyst. A total of 16 fully completed resident questionnaires were conducted on Little Cayman between the 24th–28th February 2011.

In addition, an analysis of DOE Enforcement report data of illegal fishing between 1993 and 2011 has been undertaken by Rhiannon Meier, showing frequency of warnings, arrests and intended prosecutions, and numbers of conch, lobster, fish and turtle caught illegally.

3.3 Interim report of fisher surveys
An interim report has been produced: Meier, R., McCoy, C., Richardson, L., Turner, J.R. (2011). Quantifying Recreational and Artisanal Fisheries of the Cayman Islands. *Darwin Initiative Interim Report.* (Annex 3, Abstract 13).

3.4 Annual Reporting to Darwin Initiative (This report)

Progress towards project outputs
Output 3 is now complete, although further analysis will be undertaken to link the total fish biomass caught to total available fish biomass on the shelf of the Cayman, to estimate the proportion of fish caught.

Outputs 4-7: Plan and promote an extension to the MPA system with full public consultation and involvement.

Indicators for outputs 4-7:

Using data from 1-4, plan extended MPA zones to cover all representative habitats, covering at least 30% shallow marine environment.
Initial consultation to ensure public participation on all 3 islands. Show benefits in terms of results of MPA effects on reef resilience
Ecological gap Analysis, and Protected Area Tools in GIS such as Environmental Risk Surface, Relative Biodiversity Index, and Marxan and Mazone protect area planning software.
GIS data system to show revised boundaries and purpose of zones.
Stakeholder workshops and public presentations on all 3 islands.
Acceptance and implementation of extended MPA system.

Means of verification of outputs 4-7:
MPA plans led by Dept of Environment (DOE), Cayman Islands to ensure local ownership, with overseas scientists maintaining behind the scenes advisory scientific role.
Changes in legislation required, facilitated by Director, DOE through Government.
Modified Management plan accepted.
Modified Monitoring plans accepted.
Modified enforcement plans accepted.

Important Assumptions for Outputs 4-7:
Unusually, there are few assumptions or risks here. Caymanians have been highly supportive of MPA system since benefits have been so obvious, especially in comparison with other Caribbean islands where reefs are substantially more degraded

Threats from climate change are widely recognised (especially increased intensity and frequency of hurricanes, sea level rise and mass coral mortality from bleaching and disease) because most have suffered effects. Coastal protection and income from tourism are recognised as being widely important and need to update MPA system is generally understood. Sensitization is already high due to existing MPA system, and education elements are already exceptionally strong.

Progress in carrying out Activities in Output 4-7:

4.1 Ecological Gap Analysis update and review: The EGA has been completed on schedule for all 3 islands by TNC (Byrne and Schill) with Olynik and Austin (DOE), between April 2010 and March 2011.

4.2 Steering Group Meeting 3: Identification of concerns and threats: Originally scheduled for April 2011, but now to be run in June 2011, when Turner is in Cayman,

4.3 District community stakeholder meetings on Grand Cayman, Little Cayman and Cayman Brac: engage comments on perceived threats and goals. Scheduled for June 2011.

4.4 Environmental Risk Assessment and mapping:
ERA has been completed for all 3 islands by TNC (Byrne and Schill) with Olynik and Austin (DOE) between April and March 2011, and is therefore ahead of schedule (planned for July and August 2011.

4.5 Field survey to verify specific habitat: Scheduled for July August 2011.

The remaining activities are scheduled from January 2012 (with exception of 6.5, which has been partly met):

5.1 *Steering Group Meeting 4: Marine Protected Area Planning*

5.2 *Marine Conservation workshop 2 and training: Site Conservation Index and Relative Biodiversity Index Assessment Calculation Workshop*

5.3 *Marne Conservation Workshop 3 and training: Use of Marxan protected area modelling software*

5.4 *Review conservation scenarios - determine optimal configuration of protected areas that meet user defined conservation goals.*

5.5 *Field verification of possible configurations*

6.1 *Marine Conservation Board and Community Stakeholder consultation (3) on MPA protected area optimal configuration*

6.2 *Steering Group Meeting 5: Consideration of feedback and implementation planning*

6.3 *Marine Conservation Law modifications*

6.4 *Development of MPA management plan, monitoring plans, enforcement plans and education plans*

6.5 ***Presentations at international conferences***
Presentations have been made to date at the following regional and international conferences:

Turner, J.R.; McCoy, C; Barton, A; Campbell, J., Dromard, C., Gall, S., Henshall, B., Pisani, N. (2010). Established Marine Protected Areas enhance the resilience of Caymanian coral reefs. *Euro. ISRS symposium, Reefs in a Changing Environment*. 13-17th December, Hof van Wageningen, Netherlands. (Annex 3, abstract 14)

Turner, J.R., McCoy, C., Byrne, J, Barton, A; Campbell, J., Dromard, C., Gall, S., Henshall, B., Pisani, N. (2010). Towards enhancing an established marine protected area system, Cayman Islands. *Reef Conservation UK. 13th Annual Meeting*. London Zoo. 4th December. (Annex 3, abstract 15)

Dromard, C.R., McCoy, C., Turner, J. R. (2010) *Evaluation of marine protected area's performances: the case of Little Cayman and Cayman Brac, Cayman Islands*. GCFI San Juan, Puerto Rico 1st -6th November 2010. (Annex 3, Abstract 12)

McCoy, M., Dromard, C., Turner, J.R. (2009). An evaluation of Grand Cayman Marine Protected Area Performance: a comparative study of coral reef fish communities. *Proceedings of the 62nd GCFI Gulf and Caribbean Fisheries Institute*, Cumana Venezuela. (Annex 3, abstract 2)

6.6½ *year report to Darwin Initiative on implementation*

6.7 *Finalisation of maps, signage and brochures*

6.8 *Acceptance and implementation of extended MPA system*

7.0 *Final Steering Group Meeting and Final Report to Darwin Initiative*

Progress towards project outputs
The project is ahead of schedule in relation to output 4, activities 4.1 and 4.4 (EGA and ERA complete), with the bulk of activities in this area beginning in June 2011 and extending through 2012 and 2013.

4.2 Standard Measures

Table 1 Project Standard Output Measures

Code No.	Description	Year 1 Total	Year 2 Total	Year 3 Total	Year 4 Total	Total to date	Number planned for reporting period	Total planned during the project
1A	Number of people to submit thesis for PhD qualification (in host country)			1				1
1B	Number of people to attain PhD qualification (in host country)			1				1
2	Number of people to attain Masters qualification (MSc, MPhil etc)	2					2	8

Code No.	Description	Year 1 Total	Year 2 Total	Year 3 Total	Year 4 Total	Total to date	Number planned for reporting period	Total planned during the project
4A	Number of undergraduate students to receive training (case study in Bangor modules)	90					90	270
4B	Number of training weeks to be provided	0.2					0.2	0.6
4C	Number of postgraduate students to receive training (case study, Bangor modules)	30					30	90
4D	Number of training weeks to be provided	0.2					0.2	0.6
5	Number of people to receive at least one year of training (which does not fall into categories 1-4 above)	2					2	4
6A	Number of people to receive other forms of education/training (which does not fall into categories 1-5 above)	1					1	1
6B	Number of training weeks to be provided	4					4	8
7	Number of (ie different types - not volume - of material produced) training materials to be produced for use by host country	2					2	4
8	Number of weeks spent by UK project staff on project work in the host country	52					52	156
9	Number of species/habitat management plans (or action plans) to be produced for Governments, public authorities, or other implementing agencies in the host country	2					2	2
10	Number of individual field guides/manuals to be produced to assist work related to species identification,	2					2	2

Code No.	Description	Year 1 Total	Year 2 Total	Year 3 Total	Year 4 Total	Total to date	Number planned for reporting period	Total planned during the project
	classification and recording							
11A	Number of papers published in peer reviewed journals							10
11B	Number of papers to be submitted to peer reviewed journals	3					3	12
12B	Number of computer based databases to be **enhanced** and handed over to host country	2					2	2
14A	Number of conferences/seminars/ workshops to be **organised** to present/disseminate findings	2						8
14B	Number of conferences/seminars/ workshops **attended** at which findings from Darwin project work have been presented/ disseminated.	4					4	13
15A	Number of national press releases in host country(ies)	3						?
15C	Number of national press releases in UK	2						?
15D	Number of local press releases in UK	3						?
16A	Number of newsletters produced	2						?
17B	Number of dissemination networks to be **enhanced/ extended**	2						?
18A	Number of national TV programmes/features in host country(ies)	2						11
19A	Number of national radio interviews/features in host county(ies)	1						
19B	Number of national radio interviews/features in UK	0						
22	Number of permanent field plots to be established during the project and continued	55	+8					63

Code No.	Description	Year 1 Total	Year 2 Total	Year 3 Total	Year 4 Total	Total to date	Number planned for reporting period	Total planned during the project
	after Darwin funding has ceased							
23	Value of resources raised from other sources (ie in addition to Darwin funding) for project work	264, 828	273, 073	275, 182				813,083
New -Project specific measures								

Table 2: Publications

Meier, R., McCoy, C., Richardson, L., and Turner, J.R (2011). Quantifying the impact of recreational and artisanal fisheries, in the Cayman Islands, through the use of socio-economic questionnaires. *Darwin Project Interim Report.*

McCoy, C, Richardson, L, Turner, J.R. Estimating marine reserve effects through quantification of macroalgal biomass on a central Caribbean coral reef. Poster presentation. *Association of Marine Laboratories of the Caribbean Meeting*, Costa Rica June, 2011.

Turner, J.R.; McCoy, C; Barton, A; Campbell, J., Dromard, C., Gall, S., Henshall, B., Pisani, N. (2010). Established Marine Protected Areas enhance the resilience of Caymanian coral reefs. Oral presentation. *Euro. ISRS symposium, Reefs in a Changing Environment*. 13-17th December, Hof van Wageningen, Netherlands.

Turner, J.R., McCoy, C., Byrne, J, Barton, A; Campbell, J., Dromard, C., Gall, S., Henshall, B., Pisani, N. (2010). Towards enhancing an established marine protected area system, Cayman Islands. Oral presentation. *Reef Conservation UK. 13th Annual Meeting*. London Zoo. 4th December.

Conference Poster Presentation: Campbell, J.L. (2010). Recovery of Caymanian reefs after a coral bleaching event; can marine parks help? Poster Presentation *Reef Conservation UK. 13th Annual Meeting*. London Zoo. 4th December.

McCoy, M., Dromard, C., Turner, J.R. (2010). An evaluation of Grand Cayman Marine Protected Area Performance: a comparative study of coral reef fish communities. (paper & oral presentation) in Proceedings of the 62nd GCFI Gulf and Caribbean Fisheries Institute, Cumana Venezuela. (submitted)

Dromard, C.R., McCoy, C., Turner, J. R. (2010) *Evaluation of marine protected area's performances: the case of Little Cayman and Cayman Brac, Cayman Islands*. Oral presentation and paper. GCFI San Juan, Puerto Rico 1st -6th November 2010.

Henshall, B., McCoy, C. Turner, J.R.,(in submission) Maintaining reef resilience: the characteristics and spatial distribution of fishing pressure from the recreational and artisanal fisheries of the Cayman islands Reef Conservation UK. *PLoSOne*

Gall, S., McCoy, C. Turner, J.R., (in submission) The effect of long established marine protected area on Caymanian coral reefs. *Biological Conservation*

Henshall, B., Turner, J.R., McCoy, C. (2009). Maintaining reef resilience: the characteristics and spatial distribution of fishing pressure from the recreational and artisanal fisheries of the Cayman islands. Oral presentation. Reef Conservation UK. 12th Annual Meeting. London Zoo. 5th December.

Gall, S., Turner, J.R., McCoy, C. (2009). The effect of long established marine protected area on Caymanian coral reefs. Oral presentation. Reef Conservation UK. 12th Annual Meeting. London Zoo. 5th December.

McCoy, M., Dromard, C., Turner, J.R. (2009). An evaluation of Grand Cayman Marine Protected Area Performance: a comparative study of coral reef fish communities. Paper Presented at 62nd GCFI Gulf and Caribbean Fisheries Institute, Cumana Venezuela.

Campbell, J. (2010) Recovery of Caymanian reefs after a coral bleaching event. *MSc thesis, University of Bangor*. 89p

Barton, A. (2010) An assessment of Caymanian coral reefs: are the long established marine no take zones enough?. *MRes Thesis, University of St Andrews.* 102p.

Gall, S. (2009). The effect of long established Marine Protected Areas on the resilience of Caymanian coral reefs. *MSc Thesis* University of Wales, Bangor.113p.

Henshall, B. (2009). Maintaining reef resilience: the characteristics and spatial distribution of fishing pressure from the recreational and artisanal fisheries of the Cayman islands. *MSc Thesis* University of Wales, Bangor.107p.

4.3 Progress towards the project purpose and outcomes

We feel that at this early stage, we are making strong progress towards stated purposes and outcomes (Above sections, and Annex 1 log-frame). It is too early to assess the full impact of the project. Important impacts on biodiversity that will influence the sustainable use of biodiversity benefits are at the core of the project. The purpose level assumptions still hold true and the indicators for measuring outcomes are remain appropriate at this stage.

4.5 Progress towards impact on biodiversity, sustainable use or equitable sharing of biodiversity benefits

This Darwin project will provide the scientific evidence, resource the consultative process, extend manpower and enrich expertise to enable the Cayman to increase the area of shelf sea under protection from 16.7% to approximately 30%, thereby going significantly beyond the recommendations of the Convention on Biological Diversity of 10%. The project will provide the information base for the DOE to assess, review, plan, and promote an extended MPA system for the foreseeable future. DOE do not have the scientific resources to undertake such major interim studies, but they do have the expertise and goodwill of the local population to effectively manage and enforce the current and an extended MPA system, which is essential to maintain the resilience of reefs and associated ecosystems in response to coastal development and climate change. Datasets and specifically trained personnel will further enhance capacity, enabling Cayman to address its BAP and future national conservation legislation. Coral reefs are the most biologically diverse habitats of the oceans and provide essential ecosystem goods and services. However, at today's level of 387ppm CO_2, reefs are fast declining (19% lost, 35% threatened) with consequential impacts on associated ecosystems. Resilient reefs are known to have a better capacity to recover from damage, and management actions that reduce harvesting of herbivorous fish to sustainable levels, maintain trophic levels, manage water quality and minimise stressors will increase resilience. Networks of marine protected areas

provide an effective mechanism for such management, and a revised and updated MPA system covering at least 30% of representative habitats of coral reef and associated ecosystems in the Caymans will protect island biota, pelagic, reptile, seabird and sea mammal species at a time of increasing human impact and climate change and will ensure that the system maintains the capacity of the reefs to meet user defined conservation goals.

5. Monitoring, evaluation and lessons

Project progress is monitored and evaluated by the Principal Investigators (EBanks-Petrie (DOE), Turner (SOS Bangor) and Byrne (TNC), and through meetings of the Steering Committee. Financial monitoring is provided within DOE (by Financial administrator Margaret Buchanan) and by Bangor University Finance Office. Evaluation is being undertaken by the Marine Conservation Board, and scientific outputs are destined for peer review.

The objectives and methodologies to produce outputs were scrutinised by the Steering Committee in September 2010, and then opened for consultation and approval via the Marine Conservation Board and Watersports Association Stakeholders.

To date, the project has adhered to its activity list, budget and predefined outputs. Preliminary results have been presented to the Marine Conservation Board in Cayman, examined in MSc degree dissertations, and presented at regional and international conferences for peer review, and are now beginning to be submitted as research papers for peer review.

However, the outputs from year 1 activities have largely resulted from scientific surveys of reefs and their resources within and outside of Marine Protected Areas. The project moves into a new phase in Year 2, in which the data from Year 1 is used to develop options for extended and new marine protected areas, and these are presented to the general public and stakeholders for their consideration. Consequently, it will become more difficult to assess achievement, because a successful outcome may be perceived differently by different groups of stakeholders and on different islands. However, success can be measured by the percentage increase in well enforced marine protected areas on the Cayman shelf, beyond 16.7% and to 30 or 50%.

It will be necessary to hold more frequent steering committee meetings in Year 2, since the project will need to be more responsive to issues raised by the general public and stakeholders. The Project Leader expects to make more frequent visits to Cayman in year 2 because the project activities will become more demanding requiring greater decision making. However, it is also recognised that DOE, rather than UK staff must be the public face of the project in Cayman, especially during stakeholder meetings. The socioeconomic fishery surveys have revealed how the attitudes of fishers can vary between islands, and have highlighted important issues, where a sensitive approach is required. A flexible approach will be required in assessing indicators, because DOE will: (1) be having to consider how to manage the currently closed, but due for review, Grouper Spawning Aggregation Sites, and (2) the National Conservation Bill will be making its way through government.

6. Actions taken in response to previous reviews (if applicable)

This is our first annual report.

7. Other comments on progress not covered elsewhere

The Darwin Project Support Officer post was specified in July 2010 and was advertised during August, receiving 76 applications. The shortlist was drawn up during September though due to the high number of applicants and problems encountered revising the job specification for approval within a suitable pay band structure, interviews and hiring for the post were delayed until the end of the reporting year (March 2011). During this reporting year however, a number of temporary posts were filled (amounting to 12 months paid salary) by Natasha Pisani (SOS Bangor) undertaking field surveys in June-August 2010 (3 months salary); Laura Richardson (SOS Bangor) assisting with underwater photographic image databasing in Bangor and undertaking algal biomass and mobile invertebrate underwater surveys in the Cayman Islands in November-December 2010 and February-March 2011 (4 months salary); Monique Grol (SOS Bangor) assisting with underwater fish biomass surveys in the Caymans in January-February 2011 (2 months salary); and Rhiannon Meier (SOS Bangor) undertaking socio-economic questionnaire survey assessment of Caymans' artisanal/recreational fishery in February-April 2011 (3 months salary). These temporary postings have succeeded in keeping the project outputs, and especially field surveys, on target while the longer term post was being appointed. As a result, there was not a significant underspend by the end of the financial year.

We have not experienced any major risks to the project, nor do we predict any in the foreseeable future.

8. Sustainability

During year 1, the project has aimed to establish the scientific evidence for promoting an enhancement to the Marine Protected Area System of the Cayman Islands. The Project therefore established a sound dataset prior to being publicly launched by the Governor, such that a case could be made for MPA enhancement to the general public and stakeholders. In year 2, the emphasis will be on public and stakeholder engagement in considering different options for MPA design. The Cayman will be celebrating 25 years of Marine Protected Areas in April/May, providing an excellent opportunity to raise the profile of the project and its aims. There will be considerable legacy aspects to this project including the logistical and legal framework to support an enhanced marine protected area system in the Cayman Islands (with the optimal configuration of enlarged MPA system increasing coverage from the current 16.7% to at least 30% of the Cayman shelf if appropriate), The stable end-point will be an enhanced MPA system of representative habitats of coral reef and associated ecosystems, thereby helping to protect island biota, pelagic, reptile, seabird and sea mammal species at a time of increasing human impact and climate change. DOE will ensure that the MPA system is a central component of current and future planning, to be incorporated into future national climate change response policy (including: Grand Cayman Development Plan, Disaster Risk Management Framework, National Conservation Bill, Storm Atlas). Involvement of most DOE staff in field training and Marine Workshops will have enhanced institutional capacity and personal involvement in future planning. McCoy will have a doctorate, and is committed to working in DOE in Cayman in the long term. Collaborative partner TNC has established expertise in nurturing MPAs in the Caribbean region over the long term, through increasing funding, building support and improving management. A robust MPA system will need to be reviewed regularly and maintain flexibility with continued stakeholder consultation and representation in management. The establishment of financial mechanisms that drive funding to protected areas including endowment funds, and payments for natural resources and services that protected areas supply may be necessary in the future.

9. Dissemination

Dissemination efforts have been targeted at key stakeholders in government and business (represented by the Marine Conservation Board, Watersports Association and district communities) during the launch period of the project (October 2010) and national media activity in the Cayman Islands will have widened the impact:

Press coverage in host country:

29.10.10 cayCompass.com: '*Marine parks could be doubled*' (http://www.compasscayman.com/caycompass/2010/10/29/Marine-park...)
29.10.10 Caymanian Compass (national newspaper): '*Marine parks could be doubled*'
29.10.10 Cayman Islands Government www.gov.ky: '*Marine Parks: A delicate Balance*' (http://www.gov.ky/portal/page?_pageid=1142,5140536&_dad=portal)

National Cayman television features:

'New initiative launched to protect marine biodiversity' (27th October 2010): (http://www.cayman27.ky/news/item/7394**)**

'Environment Break: Darwin Initiative' (8th November 2010): (http://www.cayman27.com.ky/news/item/7548)

Associated with this Darwin project, the Cayman Islands are currently celebrating 25 years of marine parks (MP25), which is being actively promoted by DOE with a dedicated logo (featured on outgoing email correspondence from DOE, DOE website banners and MP25 web page on the DOE site), media coverage (documenting the history of Cayman marine parks in a 3 part series; part 1 'Environment Break: Marine Parks History'(11th April 2011): http://www.cayman27.ky/news/item/9395) and public outreach events. In the forthcoming year, a number of public outreach events will promote the MP25, including more television features, a children's poster campaign and reception event entitled 'Meet the Marine Parks', strong promotion of MP25 at the annual 'Pirates' Week' and proposed partnerships with the Cayman Islands Government Department of Tourism and key tourism industry members for the purposes of cross-branding their activities with the MP25. It is hoped that with promotion of the existing parks, this will feed well into the parks eventual proposed enhancement and expansion with the completion of this project. Press releases in the UK during the Darwin project launch and in this first reporting year will have also expanded the impact of this project on an international scale:

Press coverage in UK:

Bangor web page: Bangor scientist to help protect Marine Biodiversity in the Caribbean 28.10.10 http://www.bangor.ac.uk/news/full.php.en?nid=2401&tnid=2401

02.11.10 ITV Wales blog: '*Welsh scientists join Cayman Islands conservation project*' (http://itvwalesblog.com/2010/11/02/welsh-scientists-join-cayman-islands-conservation-project/)

02.11.10 Wales Tonight (ITV Wales) – ITV Local: '*Caribbean Conservation*' (http://www.itv.com/wales/cayman-islands-research39013/)

02.11.10 Welsh Country Magazine: '*Bangor University Scientist to help protect Marine Biodiversity in the Caribbean*' (http://www.welshcountry.co.uk/news-from-around-wales/74-gwynedd/8312-bangor-university-scientist-to-help-protect-marine-biodiversity-in-the-caribbean)

03.11.10 Science News blogspot: '*Bangor Scientist to help protect Marine Biodiversity in the Caribbean*' (http://news-science-news.blogspot.com/2010/11/marinebiologyinternational-bangor.html)

03.11.10 Daily Post (regional Welsh newspaper): '*Reef Relief: Caribbean Mission for N. Wales University Team*'

UK Overseas Territories Conservation Forum, *Forum News No 37, P.16 December 2010.*

In the forthcoming year we plan to expand web, media and newsletter activity alongside scientific presentation of research findings in high impact international journals and at international conferences to increase the profile of the project within the host country, Caribbean region and UK, and the broader international scientific community.

The Darwin logo is displayed on DOE research boats (we have photographs).

The DOE actively promotes their work and efforts with media dissemination, public outreach (meetings, receptions, community events eg Agricultural shows, school and educational visits) and through scientific research conducted and presented to the wider scientific community via national, regional and international conferences and published studies in scientific journals. As such, it is expected that DOE will continue such activities in relation to the enhanced MPA system that will result from this project.

10.Project Expenditure

Table 3 project expenditure during the reporting period (1 April 2010 – 31 March 2011)

Item	**Budget** (please indicate which document you refer to if other than your project application or annual grant offer letter)	**Expenditure**	**Variance/ Comments**
Staff costs N Pisani L Richardson R Meier M Grol Total Staff costs			
Overhead costs			
Travel and subsistence			
Operating costs			
Capital items/equipment Olympus camera & accessories, zoom lens, strobe; Blufin Sony Camcorda, accessories, video camera, underwater strobe and infra red cable			
Others: Consultancy			
Others (please specify)			
TOTAL			

Notes: The unexpected underspend on staff costs is mostly due to employers pension contributions net being taken up, because in year 1, it was agreed to employ staff as Field Support Officers for specific tasks on a non contractual basis, prior to employing the Project Support Officer full time. One month's salary was not taken up in year 1, due to the time it took to recruit the Field Support Office at the beginning of the project. These two aspects were discussed with LTS. The underspend on operating costs is addressed by equipment costs – this is because video camera and photographic equipment have been used more extensively to work more efficiently and save time during underwater survey. We request virement from 'Others' and 'Operating cost' headings to Equipment and travel and Subsistence to balance these items.

10. OPTIONAL: Outstanding achievements of your project during the reporting period (300-400 words maximum). This section may be used for publicity purposes

I agree for LTS and the Darwin Secretariat to publish the content of this section.

Established Marine Protected Areas enhance the resilience of Caymanian coral reefs.

The Cayman Islands present a rich marine environment, seemingly benefiting from over two decades of world-class *in situ* conservation through the active enforcement of zoned MPAs. However, local development, regional degradation and increasing risk from climate change impact have necessitated a review of the MPA system, to assess whether MPAs are optimal in area, appropriately located, and provide maximum resilience. Initial studies addressed: (1) the current level of reef resilience within and outside all marine protected areas of Grand Cayman, Little Cayman and Cayman Brac; (2) the overspill of fish biomass from all No-Take zones; and (3) the impact of the artisanal/recreational fishery. Study 1 identified that the coral-algae dominance phase shift has occurred on Caymanian reefs; algal cover now dominates (80%) but species diversity, richness and coral cover are greater within MPAs and algae cover lower than outside protected areas. Study 2 surveyed reef fish within and outside MPAs and demonstrated that fish biomass within protected zones was 2 x higher for herbivores, and 4 x higher for carnivores than fished areas, and there was evidence for a 'Spillover' of higher fish biomass up to 5km beyond the MPA boundary. Study 3 used structured questionnaires to identify that 87% of fish caught were reef species including important and vulnerable species such as herbivores and those forming spawning aggregations. Habitat maps, Ecological Gap Analysis and Protected Area GIS Tools (*Marxan, Marzone*) are now being used together with stakeholder consultation to review, plan and promote an extended MPA system. Long term benefits from resilient reefs will be the protection of biodiversity, people, critical infrastructure, property and coasts, and enhance sustainable use by residents and visitors, and thus economic development, demonstrating the benefits of an enhanced zoned MPA system to the wider Caribbean and beyond. Established Marine Protected Areas enhance the resilience of Caymanian coral reefs.

Images: We have a large number of excellent images of meetings with stakeholders, local partners and SOS Bangor staff involved with marine and socio-economic fieldwork, and the coastal and marine environment (fish, corals, mobile invertebrates, marine birds, algae and diver surveyors, boats with Darwin logo), all of which we would be happy to share to raise the profile of our work and the Darwin Initiative.

Annex 1: Report of progress and achievements against Logical Framework for Financial Year 2010-2011

Project summary	Measurable Indicators	Progress and Achievements April 2010 - March 2011	Actions required/planned for next period
Goal: *To draw on expertise relevant to biodiversity from within the United Kingdom to work with local partners in countries rich in biodiversity but constrained in resources to achieve* ⇒ The conservation of biological diversity, ⇒ The sustainable use of its components, and ⇒ The fair and equitable sharing of the benefits arising out of the utilisation of genetic resources		Significant steps have been made towards project aims in the first year of a 3 year project.	
Purpose To ensure coastal protection for human settlements and future tourism income by enhancing the protection of coral reefs thereby allowing rehabilitation of supporting ecosystems, through increased resilience to climate change.	Increases in species abundance diversity, biomass, size and fecundity and therefore resilience to major impacts both in and (through spillover) outside MPAs.	Training, monitoring, research and involvement of key stakeholders for the purpose of marine protected area system enhancement with completion of the project is well underway.	Marine Protected Area planning tools and GIS will be used to design options for consideration and consultation at stakeholder workshops and District community meetings to determine optimal configuration of protected areas that meet user defined goals.
Output 1. Map the reef and associated subtidal ecosystem habitats around the islands to assess habitat variation and examine representativeness	Marine Habitat classification and GIS available in Cayman from Darwin project 14051. Additional data from satellite, *In situ* acoustic surveys (multibeam) & groundtruthing surveys from TNC Caribbean Challenge (Byrne). Report to DOE / papers	Progress has been excellent with all planned activities for Q1 successfully completed and output 1 completed in full and in some cases well ahead of schedule. Indicators remain appropriate. Surveys established that despite many corals bleaching in September 2009, that there was no mass mortality event and that habitats need not be reclassified. Local and UK press and television coverage supported the project launch by Cayman Islands Governor.	
Activity 1.1 Steering Group Meeting 1 to Establish Darwin project in DOE with project partners		Meeting held, excellent format for periodic project review – all key project members present. Topics covered included: project partnerships, links with previous Darwin project, review of project objectives, activities, work plan, training, budget, publicity and stakeholder liaison.	
Activity 1.2 Stakeholder meeting 1: Marine Conservation Board		Meeting held with key project members and seven key Marine Conservation Board representatives. Topics discussed: project outline and objectives. Engagement and ideas exchange encouraged.	

Project summary	Measurable Indicators	Progress and Achievements April 2010 - March 2011	Actions required/planned for next period
Activity 1.3 Link with Darwin 14051 (Exeter) review of BAP and GIS Marine habitat maps (Cayman)		Completed with DOE project 14051 personnel in Grand Cayman and key current Darwin project personnel. Habitat mapping from 2004 and 2008 is robust (supported by independent assessment). BAPs for marine habitats and species reviewed. Aimed expansion of current no take zones from 16.7% of Cayman shelf to at least 30% and possible aim of 50% agreed.	
Activity 1.4 Assess existing long term data sets		Data collated and assessed as suitable for analysis. Some preliminary qualitative analysis undertaken.	
Activity 1.5 Initial Ecological Gap Analysis assessment (EGA) (Marine Conservation Workshop 1)		EGA assessment completed for Grand Cayman during Marine Conservation Workshop 1, resulting in creation of marine environmental risk surface, list of biodiversity conservation targets, and latest software training. The same has also been completed for Cayman Brac and Little Cayman following the workshop.	
Activity 1.6 Steering Group Meeting 2: Objectives and methodologies		Meeting held – all key project members present (including previous Darwin project staff from DOE). Research objectives and methodologies finalised.	
Output 2. Assessment of the current level of reef resilience within and outside the Marine Protected Areas of Grand Cayman, Little Cayman and Cayman Brac An assessment of the extent of	Measures of: Coral cover Coral species abundance Calcareous and fleshy macroalgae Coral recruits Frequency of coral diseases and bleaching Frequency of Herbivorous fish Quantification of other impacts e.g. anchoring damage. Report to DOE / papers Diving surveys of fish species	Output 2 is on schedule with all year 1 proposed activities successfully completed. Preliminary results have been widely disseminated at regional and UK scientific meetings. Indicators remain appropriate.	

Project summary	Measurable Indicators	Progress and Achievements April 2010 - March 2011	Actions required/planned for next period
overspill of fish biomass from the No Take Zones into surrounding zones	abundance and size, to assess biomass at sites within and at increasing distances outside of No Take Marine Protected Zones. Report to DOE		
Activity 2.1 Reef resilience field training and survey		Training and surveys for year 1 completed: benthos video and photo surveys for all islands; 2 MSc theses produced; algal biomass survey on Grand Cayman (results under analysis). Benthos surveys will be repeated in the next period, with a focus on coral community structure and coral disease, and archival video recording, with training provided where required.	
Activity 2.2 Fish biomass field training and survey		Repeated training and fish biomass surveys completed twice within reporting period: early 2010 and 2011. Results to date have been presented at regional meetings. Fish biomass surveys will be repeated in the next period (August to Sept) to check for stability/seasonality and training provided where required.	
Activity 2.3 ½ year reports Darwin Initiative and Interim Report on benefits of MPA		Submitted.	
Activity 2.4 Stakeholder meeting 2: Marine Conservation Board		Meeting held: preliminary results of surveys discussed with stakeholders to promote benefits of MPA system. Key stakeholder concerns identified.	
Activity 2.5 Reef resilience survey 2		Scheduled July-August 2011 with focus on coral colony size, recruits and community structure, and coral disease	
Activity 2.6 Fish biomass survey 2		Scheduled August-September 2011 with a focus on a different seasons assessment, and possible survey of overspill corridors	
Activity 2.7 ½ year report to Darwin Initiative and Final report on Benefits of extended MPAs		Due October 2011.	
Output 3. An assessment of the artisanal/recreational fishery	Socio-economic questionnaires directed at recreational fishers (visiting piers, and via patrol boat), tourists in departure lounge at airport and via hotel excursion operators, diving operators, charter	Interim report submitted. Additional analysis linking fishing pressure and current fish biomass will be carried out. Indicators are appropriate	

Project summary	Measurable Indicators	Progress and Achievements April 2010 - March 2011	Actions required/planned for next period
	boat skippers, and migrant workers Report to DOE.		
Activity 3.1 Socioeconomic assessment of artisanal and migrant worker fishers		Surveys completed successfully on all three islands.	
Activity 3.2 Socioeconomic assessment of recreational fishers			
Activity 3.3 Interim report of fisher surveys		Report produced.	
Activity 3.4 Annual Reporting to Darwin Initiative		Completed herein.	
Details of Output 4-7		Project is ahead of schedule in relation to output 4, activities 4.1 and 4.4. Indicators remain appropriate.	
Activity 4.1 Ecological Gap Analysis update and review		Completed for all three islands.	
Activity 4.2 Steering Group Meeting 3: Identification of concerns and threats		Re-scheduled from April 2011 to June 2011 to coincide with Turner's next visit	
Activity 4.3 District community stakeholder meetings on Grand Cayman, Little Cayman and Cayman Brac: engage comments on perceived threats and goals		Scheduled for June 2011 to coincide with Turner's next visit	
Activity 4.4 Environmental Risk Assessment and mapping		Completed ahead of schedule for all three islands.	
Activity 4.5 Field survey to verify specific habitats		Scheduled for July-August 2011.	
Activity 5.1 Steering Group Meeting 4: Marine Protected Area Planning		Scheduled January 2012.	
Activity 5.2 Marine Conservation workshop 2 and training: Site Conservation Index and Relative Biodiversity Index Assessment Calculation Workshop		Scheduled January 2012.	
Activity 5.3 Marine Conservation Workshop 3 and training: Use of Marxan protected area modelling software		Scheduled January - February 2012.	
Activity 5.4 Review conservation scenarios - determine optimal configuration of protected areas that meet user defined conservation goals		Scheduled February March 2012.	

Project summary	Measurable Indicators	Progress and Achievements April 2010 - March 2011	Actions required/planned for next period
Activity 5.5 Field verification of possible configurations		Scheduled March April 2012.	
Activity 6.1 Marine Conservation Board and Community Stakeholder consultation (3) on MPA protected area optimal configuration		Scheduled April 2012.	
Activity 6.2 Steering Group Meeting 5: Consideration of feedback and implementation planning		Scheduled April 2012.	
Activity 6.3 Marine Conservation Law modifications		Scheduled May – December 2012.	
Activity 6.4 Development of MPA management plan, monitoring plans, enforcement plans and education plans		Scheduled May – December 2012.	
Activity 6.5 Presentations at international conferences		Presentations made at regional and international conferences, including: Euro. ISRS Symposium Netherlands, Reef Conservation UK London, GCFI Puerto Rico, GCFI Venezuela.to date. Further presentations planned for Association of Caribbean Marine Laboratories 2011, International Marine Conservation Congress 2012, and International Coral Reef Symposium, Cairns 2012	
Activity 6.6 ½ year report to Darwin Initiative on implementation		Scheduled October 2012.	
Activity 6.7 Finalisation of maps, signage and brochures		Scheduled from January – February 2013.	
Activity 6.8 Acceptance and implementation of extended MPA system		Scheduled from March 2013.	
Activity 7.0 Final Steering Group Meeting and Final Report to Darwin Initiative		Scheduled March 2013.	

Annex 2 Project's full current logframe

Project summary	Measurable Indicators	Means of verification	Important Assumptions
Goal: Effective contribution in support of the implementation of the objectives of the Convention on Biological Diversity (CBD), the Convention on Trade in Endangered Species (CITES), and the Convention on the Conservation of Migratory Species (CMS), as well as related targets set by countries rich in biodiversity but constrained in resources.			
Sub-Goal: To review the effectiveness of the Marine Protected Area system of the Cayman islands in maintaining resilience of coral reefs and shallow marine ecosystems in response to direct human impact and climate change, and if appropriate, to provide the information base to extend the system to increase that effectiveness	Measures of resilience (see below – output 1) Area (km ^{2}) of specific MPA zones Currently 103.8 km ^{2} protected. Increase by approx 30% if appropriate	Coral reef and associated ecosystem survey, including in water, acoustic and satellite data sets Geographical Information System and Report of MPA acceptance and implementation, supported by public workshops and followed by management	
Purpose: To ensure coastal protection for human settlements and future tourism income by enhancing the protection of coral reefs thereby allowing rehabilitation of supporting ecosystems, through increased resilience to climate change.	Increases in species abundance diversity, biomass, size and fecundity and therefore resilience to major impacts both in and (through Spillover) outside MPAs	Future monitoring and resilience in the face of climate change, especially when compared with inadequately protected sites in many degraded Caribbean locations	Major coral bleaching event during project could severely impact shallow reefs, resulting in change of emphasis to one of assessing reef resilience and recovery. Occurred October – November 2009 to 90m depth. In medium term, and due to time lag, ocean acidification will almost certainly result from high atmospheric carbon dioxide concentrations resulting in the catastrophic loss of coral reefs. Only the most resilient species will survive in a greatly modified habitat

Project summary	Measurable Indicators	Means of verification	Important Assumptions
Outputs 1. Map the reef and associated subtidal ecosystem habitats around the islands to assess habitat variation and examine representativeness	Marine Habitat classification and GIS available in Cayman from Darwin project 14051. Additional data from satellite, *In situ* acoustic surveys (multibeam) & groundtruthing surveys from TNC Caribbean Challenge (Byrne). Report to DOE / papers	Accuracy assessment conducted under Darwin 14051 and by DOE. Additional assessment necessary to identify any change resulting from October 2009 bleaching event.	That temperatures cool in November (2009) (happening), and that bleached corals recover rather than display mass mortality (signs of recovery are apparent).
2. Assessment of the current level of reef resilience within and outside the Marine Protected Areas of Grand Cayman, Little Cayman and Cayman Brac	Measures of: Coral cover Coral species abundance Calcareous and fleshy macroalgae Coral recruits Frequency of coral diseases and bleaching Frequency of Herbivorous fish Quantification of other impacts eg anchoring damage. Report to DOE / papers	Reef survey at 55 established permanent sites around islands using visual census and video techniques. Comparisons with old data and photographs for some sites from 1970s and 1980s (source Ogden). Comparisons with permanent photo quadrats from early 2000s by McCoy. Statistical comparisons with video and visual census by Gall, McCoy & Turner, 2009. Use of experienced team with species specific knowledge, and training for junior members	Sites and techniques already established and old data and photographs archived, so no expected problems. New video data archived. Bleaching event October 2009 means early comparison with pre bleaching survey of July 2009 essential. Will require additional training of junior staff in DOE to provide appropriate dive team size to satisfy health and safety requirements and ensure future monitoring capability. Assisted by MPA Darwin Fellow and Bangor MSc project students.
An assessment of the extent of overspill of fish biomass from the No Take Zones into surrounding zones	Diving surveys of fish species abundance and size, to assess biomass at sites within and at increasing distances outside of No Take Marine Protected Zones. Report to DOE	Regular tests of visual assessments of fish size and accuracy of species recognition Enforcement of No Take Zone by MPA patrols	As above. Assumes enforcement ensures No Take Zones are not transgressed.

Project summary	Measurable Indicators	Means of verification	Important Assumptions
3. An assessment of the artisanal/recreational fishery	Socio-economic questionnaires directed at recreational fishers (visiting piers, and via patrol boat), tourists in departure lounge at airport and via hotel excursion operators, diving operators, charter boat skippers, and migrant workers Report to DOE.	Unbiased questionnaires and recorded interviews analysed from representative cross section. Questionnaires tested and trialled in 2009 by Henshall, McCoy & Turner	May not get honest answers when recreational fishers approached in patrol boat, but in general, such fishers are compliant. Honesty and safety will be issue when interviewing migrant workers (mostly Jamaican & Pakistani) who tend to fish late evening/night.
4 - 7 (subdivided below for clarity) Plan and promote an extension to the MPA system with full public consultation and involvement.	Using data from 1-4, plan extended MPA zones to cover all representative habitats, covering at least 30% shallow marine environment. Initial consultation to ensure public participation on all 3 islands. Show benefits in terms of results of MPA effects on reef resilience Ecological gap Analysis, and Protected Area Tools in GIS such as Environmental Risk Surface, Relative Biodiversity Index, and Marxan and Mazone protect area planning software GIS data system to show revised boundaries and purpose of zones Stakeholder workshops and public presentations on all 3 islands Acceptance and implementation of extended MPA system.	MPA plans led by Dept of Environment (DOE), Cayman Islands to ensure local ownership, with overseas scientists maintaining behind the scenes advisory scientific role. Changes in legislation required, facilitated by Director, DOE through Government Modified Management plan accepted Modified Monitoring plans accepted Modified enforcement plans accepted	Unusually, there are few assumptions or risks here. Caymanians have been highly supportive of MPA system since benefits have been so obvious, especially in comparison with other Caribbean islands where reefs are substantially more degraded Threats from climate change are widely recognised (especially increased intensity and frequency of hurricanes, sea level rise and mass coral mortality from bleaching and disease) because most have suffered effects. Coastal protection and income from tourism are recognised as being widely important and need to update MPA system is generally understood. Sensitization is already high due to existing MPA system, and education elements are already exceptionally strong.

	Activities (detailed in work plan)	Monitoring Indicators
1.1	Steering Group Meeting 1 to Establish Darwin project	Existing data assessed and initial EGA completed to identify survey objectives. Stakeholders engaged with Darwin project. 2 Steering Group Meetings (1 & 2) 1 Marine Conservation Board (1) 1 Marine Conservation Workshop (1)
1.2	Stakeholder meeting 1: Marine Conservation Board	
1.3	Link with Darwin 14051 (Exeter) review of BAP and GIS Marine habitat maps (Cayman)	
1.4	Assess existing long term data sets	
1.5	Initial Ecological Gap Analysis assessment (EGA) (Marine Conservation Workshop 1)	
1.6	Steering Group Meeting 2: Objectives and methodologies	
2.1	Reef resilience field training and survey	Darwin Fellows trained in specific methodologies to take part in field work Data on MPA effects on resilience attained and compared with pilot studies Impact of October 2009 bleaching event quantified in short term and medium term Papers on reef resilience presented at GCFI 2010, Euro ISRS 2010 and ICRS 2012 accepted Benefits of MPA system quantified, and communicated to stakeholders Importance of effective enforcement reinforced and Marine Conservation Officers informed/training enhanced 1 Marine Conservation Board (2) 2 x ½ year DI reporting
2.2	Fish biomass field training and survey	
2.3	½ year reports Darwin Initiative and Interim Report on benefits of MPA	
2.4	Stakeholder meeting 2: Marine Conservation Board	
2.5	Reef resilience survey 2	
2.6	Fish biomass survey 2	
2.7	½ year report to Darwin Initiative and Final report on Benefits of extended MPAs	
3.1	Socioeconomic assessment of artisanal and migrant worker fishers	Data on non commercial fishing pressure attained & compared with pilot survey. Fisher impact compared with fish biomass study Papers on recreational fishing presented at GCFI 2010, Euro ISRS 2010 and ICRS 2012 accepted EGA reviewed in context of new field data Stakeholders views on threats and conservation goals assessed Environmental risks to specific habitats/species mapped and verified
3.2	Socioeconomic assessment of recreational fishers	
3.3	Interim report of fisher surveys	
3.4	Annual Reporting to Darwin Initiative	
4.1	Ecological Gap Analysis update and review	
4.2	Steering Group Meeting 3: Identification of concerns and threats	
4.3	District community stakeholder meetings on Grand Cayman, Little Cayman and Cayman Brac: engage comments on perceived threats and goals	
4.4	Environmental Risk Assessment and mapping	

4.5 Field survey to verify specific habitats	1 Steering Group Meeting (3) 3 Community Stakeholder meetings (3 islands) Annual DI reporting
5.1 Steering Group Meeting 4: Marine Protected Area Planning 5.2 Marine Conservation workshop 2 and training: Site Conservation Index and Relative Biodiversity Index Assessment Calculation Workshop 5.3 Marne Conservation Workshop 3 and training: Use of Marxan protected area modelling software 5.4 Review conservation scenarios - determine optimal configuration of protected areas that meet user defined conservation goals. 5.5 Field verification of possible configurations	Darwin Fellows trained in Protected Area tools Biodiversity Index for sites quantified Optimal configuration of protected areas that meet user defined conservation goals determined Verified by field assessment Papers on protected area enhancement based on quantitative assessment presented at IMCC Washington DC 1 Steering Group Meeting (4) 2 Marine Conservation Workshops (3 & 4)
6.1 Marine Conservation Board and Community Stakeholder consultation (3) on MPA protected area optimal configuration 6.2 Steering Group Meeting 5: Consideration of feedback and implementation planning 6.3 Marine Conservation Law modifications 6.4 Development of MPA management plan, monitoring plans, enforcement plans and education plans 6.5 Presentations at international conferences 6.6 ½ year report to Darwin Initiative on implementation 6.7 Finalisation of maps, signage and brochures 6.8 Acceptance and implementation of extended MPA system	Stakeholders consulted on proposed options for MPA area configuration Relevant changes in Marine Conservation Law made Monitoring plans, enforcement plans and education programs adopted Clear dissemination of new laws and areas Optimal configuration of enlarged MPA covering 30% Cayman shelf accepted if appropriate Increases in species abundance diversity, biomass, size and fecundity and therefore resilience to major impacts both in and (through Spillover) outside MPAs ½ year DI reporting Marine Conservation Board (3) 3 Stakeholder Community Meetings (3 islands) 1 Steering Group Meeting (5)
7.0 Final Steering Group Meeting and Final Report to Darwin Initiative	Final Steering Group Meeting (6) Final DI Reporting

Annex 3 Onwards – supplementary material (optional but encouraged as evidence of project achievement)

Checklist for submission

	Check
Is the report less than 5MB? If so, please email to Darwin-Projects@ltsi.co.uk putting the project number in the Subject line.	X
Is your report more than 5MB? If so, please discuss with Darwin-Projects@ltsi.co.uk about the best way to deliver the report, putting the project number in the Subject line.	
Have you included means of verification? You need not submit every project document, but the main outputs and a selection of the others would strengthen the report.	X
Do you have hard copies of material you want to submit with the report? If so, please make this clear in the covering email and ensure all material is marked with the project number.	
Have you involved your partners in preparation of the report and named the main contributors	X
Have you completed the Project Expenditure table fully?	
Do not include claim forms or other communications with this report.	