

Darwin Initiative Annual Report

Darwin Project Information

Project Ref Number	EIDPO15
Project Title	Integrating disease surveillance with conservation management for Galapagos fauna
Country(ies)	Ecuador
UK Contract Holder Institution	Institute of Integrative & Comparative Biology, University of Leeds
UK Partner Institution(s)	Institute of Zoology (IoZ), Zoological Society of London
Host country Partner Institution(s)	Galapagos National Park, University of Guayaquil
Darwin Grant Value	£119,696
Start/End dates of Project	1 st October 2006-30 th September 2007
Reporting period (1 Apr 200x to 31 Mar 200y) and annual report number (1,2,3..)	1 st October 2006 to 31 st March 2007 Annual report 1
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Project website	www.galapagoslab.org
Author(s), date	Dr S Goodman, Dr A Cunningham, Dr V Cedeño

1. Project Background

This project is a post-project extension to Darwin project 12-017 (Building capacity and determining disease threats to endemic Galapagos fauna) based in Galapagos, Ecuador, which sought to establish the capacity of the Galapagos National Park to be able to identify, carry out surveillance for, and manage disease threats to Galapagos fauna. The original project aims were achieved, so the extension seeks to maximise these benefits by providing continuing training to new and existing staff, and by responding to specific disease management requirements identified by the original work e.g. West Nile Virus (WNV) and giant tortoise health issues.

2. Project Partnerships

Project partnerships: Our relationship with the Galapagos National Park (GNP) and the University of Guayaquil (UoG) has continued with the same high level of support and commitment developed during the initial project. New MOUs covering the extension period were signed by all the partners.

The capacity building component of the current extension is about to deliver new physical infrastructure (a new laboratory building) and has already enhanced training to a larger number of park staff, leading to a greater capacity to manage disease threats to endemic fauna in Galapagos, thereby increasing capacity to meet CBD commitments. Similarly new knowledge from research outputs, and support from the project to local stakeholders is leading to new policy impacts promoting biosecurity for Galapagos.

The relationship with IoZ at the Zoological Society of London (ZSL) has continued to be strong, with considerable input from Dr Andrew Cunningham in to all aspects of the project as would be expected from his status as co-investigator, providing expertise which complements that at UoL. Minor difficulties in transferring funds to UoG were experienced following changes in administrative staff at UoG, but these have now been resolved.

Other Collaborations: As with the original project we continue to collaborate with a wide range of local stakeholders and other international organisations working in Galapagos. These include Concepto Azul (collaboration on capacity building, research, logistics); the University of Missouri & St Louis Zoo (collaboration on avian diseases in Galapagos); University of Yale (collaboration on tortoise management and conservation genetics training); University of Torvegatta, Rome, Italy (marine and land iguana health); University of Liverpool, UK (investigation of tortoise mycoplasmas); Charles Darwin Research Station (CDRS, collaboration on disease management, mosquito ecology, lobbying and policy, logistics); Wild Aid (collaboration on lobbying and policy); New York State Dept Health (collaboration on mosquito biology and West Nile Virus impacts). We have made contact with the Galapagos based staff of Darwin project 15-05 (based at the CDRS) who use the Galapagos laboratory facilities available through our project, and they are also assisting our investigations of mosquito distributions in the archipelago by helping with mosquito trapping at their field sites.

3. Project progress

3.1 Progress in carrying out project activities

The overarching project outputs from the logframe are: 1) Increased capacity of lab to deal with specific identified disease threats is expanded, and development of current programmes; 2) Construction of annex to existing lab for sample archive and necropsy room; 3) Enhanced capabilities of project managers to translate research outputs in to conservation practice; 4) Operating plan for disease management in tortoise captive breeding programme; 5) Increased conservation science taught by local teachers; 6) Participation of graduates from other Latin American countries in masters programmes at the Galapagos lab and University of Guayaquil; 7) Media representation. The following activities contributed towards these outputs:

Capacity building and training

A major component of this post-project extension was to extend the physical capacity of the Galapagos laboratory by constructing an annex to the existing building for a new pathology suite and frozen tissue archive. By March 2007 the plans for the lab annex were finalised (see annex 3) and the ground broken for the foundations. After evaluating all possibilities it was decided to construct a standard building *in situ* rather than use a prefabricated building, since negotiations with local builders have permitted a more cost effective solution to be delivered, with more space and facilities for the same unit price. Construction will be completed by July

2007. This work was delayed slightly due to the administrative problems at UoG (see section 2). Equipment will be completed once the building work is finished. Other project initiation activities including signing of new MOUs with project partners to cover extension period have been completed. The laboratory core staff continued to receive on the job training and guidance from the UK partners and University of Guayaquil/Concepto Azul.

The training workshop for WNV scheduled for February 2007 has been delayed to September 2007 after consultation with the project stakeholders (GNP and CDRS) who now wish this to be conducted as a broader risk assessment, response plan and simulation exercise under the Galapagos wide Global Environment Facility management plan for invasive species.

Captive breeding centre staff were instructed in new record keeping, information management and reporting protocols, which are now in place and being utilised. The data archives of the captive breeding centres are being reorganised and transferred to new databases compatible with the new protocols.

A UK veterinary Masters student from the University of Liverpool, UK, received 4 weeks of training in epidemiology and pathology as an intern at the laboratory.

One biology graduate from the Amazonas region of Ecuador spent 4 weeks gaining work experience at the laboratory

Together these contribute to the fulfilment of year 1 aims for outputs 1, 2, 3, 4.

Research, Disease Monitoring and Conservation

The laboratory has been continuing its previous research and monitoring programmes into Galapagos wildlife diseases, and extended its monitoring for WNV (fresh road kill birds are being collected and will be tested for WNV as an efficient sampling strategy) and Chelonian herpes and tortoise mycoplasma (wild and in captive breeding centres). New procedures for the monitoring of tortoise health in captive breeding centres were introduced, and initial consultation with captive breeding programme staff have been made to design new implementation strategies for further discussion at a tortoise management workshop. Together these fulfil the year 1 aims for outputs 1, 3, 4. Genetics studies are underway on Galapagos mosquitoes (via a Marie Curie PhD studentship to Arnaud Bataille, a Belgian student registered at the University of Leeds), tortoise intestinal parasitic nematodes and tortoise blood parasites. Together these contribute to the fulfilment of year 1 aims for outputs 1, 3, 4.

The laboratory has now been formally incorporated in to the operating procedures for two further important areas of Park activities. Firstly, the Ecuadorian laboratory staff are consulted over all applications to the Park by prospective exporters (e.g. visiting scientists) for permits to export biological samples from the archipelago. This scientific review by lab staff should lead to more oversight of the appropriateness of allowing samples to be exported and therefore greater control of Galapagos bio-resources, contributing to CBD commitments. Secondly the laboratory staff also evaluate all applications for research permits to undertake biological research in the archipelago, again to give the Park a scientific assessment of the appropriateness and rigour of proposed research activities. This is a significant enhancement of Park capabilities that greatly increase the Parks control over activities that involve scientific exploitation of Galapagos biodiversity (see also Dissemination of results).

Education programme

Local community workshop on wildlife disease issues has been postponed to later in 2007/8 to tie in with the activities on WNV management (see capacity building and training). No other activities in this theme were scheduled for completion in year 1 (2006-2007).

Dissemination of results

Work on the genetic population structure of Galapagos mosquitoes and its implications for disease epidemiology was presented as talk by Arnaud Bataille at the Population Genetics meeting (an international conference) at the University of Manchester, UK, January 2007.

In early 2007 following the election of President Correa in November 2006, Dr Cedeño (the Ecuadorian director of the laboratory) led a meeting with the newly appointed team at the Ministry of Environment, including advisors to the Minister of Environment. This meeting presented the Darwin project, the laboratory and its role within the Galapagos National Park to the Ministry.

The project was featured and Dr Cedeño interviewed for the BBC television documentary "Lonesome George and the battle for Galapagos", 1 hour, originally broadcast in the UK on BBC4 8th October 2006.

3.2 Progress towards Project Outputs

1) Increased capacity of lab to deal with specific identified disease threats is expanded and development of current programmes

The completion of the new laboratory annex in the coming months will enhance the capability of the Galapagos lab by providing much needed space to house its expanding activities, enhance capabilities for necropsy, other pathology investigations and to archive frozen material from many different projects in the archipelago. New diagnostic protocols e.g. monitoring for and sampling of sick tortoises for mycoplasma culture have been introduced and a protocol has been set up with the University of Liverpool for mycoplasma identification. Similarly the ongoing training activities for project staff and are leading to greater capabilities for disease investigations, management of disease issues, and integration of the laboratory into the central operating strategy of the GNP. The progress so far indicates we are on target to deliver the full outputs in this theme by the end of the project. There are no significant issues regarding output level assumptions.

2) Construction of annex to existing lab for sample archive and necropsy room

The plans for the annex were finalised and ground broken for foundations by March 2007. Construction expected to be completed by July 2007. Thus this output will be delivered in full a few months behind the originally anticipated schedule of April 2007. A delay caused by administrative difficulties at the UoG due to staff changes at the university (now resolved).

3 & 4) Enhanced capabilities of project managers to translate research outputs in to conservation practice; Operating plan for disease management in tortoise captive breeding programme

There are now increased communications with the technical department of the Park, with specific Park staff now responsible for liaison with the laboratory. Regular reports on research activities at the laboratory are made to these staff with recommendations for action points. Key staff will participate in disease (WNV etc) workshops. New record keeping, information management and reporting protocols, are now in place and are being utilised at the captive breeding centres. The data archives of the captive breeding centres are being reorganised and transferred to new databases compatible with the new protocols. Initial consultations with captive breeding programme staff have been made to design new implementation strategies for further discussion at a tortoise management workshop. The participation of the tortoise breeding centre staff in the project, introduction of new protocols at the centres, initial consultation exercise and general support and endorsement by GNP indicate that this output is

on track and will be delivered for the end of the project, and that the outputs will have conservation impacts. There are no significant issues regarding output level assumptions.

5) Increased conservation science taught by local teachers

The main delivery period for this output is scheduled for later in the project, but progress has been made in discussing development of the programme with the stakeholders and identifying teachers who will participate.

The ongoing programme of visits by high school children to the laboratory was maintained with up to 10 high school children on work experience programmes lasting 1 month. Additionally an 'open house' event demonstrating the laboratories activities was held over 1 weekend in November 2006 for all schools in Puerto Ayora (the town where the lab is located), which was attended by approximately 100 children.

Progress so far indicates we are on target to deliver outputs in this theme by the end of the project. There are no significant issues regarding output level assumptions.

6) Participation of graduates from other Latin American countries in masters programmes at the Galapagos lab and University of Guayaquil

The preparatory work for this activity is underway (e.g. forming necessary links with education institutions in other countries, administration to establish programme at the University of Guayaquil etc). The main development of this output will take place in 2007-8 academic year.

An intensive workshop on conservation genetics is being planned for December 2007, in collaboration with the University of Yale, USA, with additional funding from a grant awarded by the American Genetics Association. In this first year the focus will be mainly on Ecuadorian students from the mainland.

The progress so far indicates we are on target to deliver the full outputs in this theme by the end of the project. There are no significant issues regarding output level assumptions.

7) Media representation.

The project was featured and Dr Cedeño interviewed for the BBC television documentary "Lonesome George and the battle for Galapagos", 1 hour, originally broadcast in the UK on BBC4 8th October 2006.

The progress so far indicates we are on target to deliver the full outputs in this theme by the end of the project. There are no significant issues regarding output level assumptions.

3.3 Standard Output Measures

Table 1 Project Standard Output Measures

Code No.	Description	Year 1 Total	Year 2 Total	Year 3 Total	Year 4 Total	TOTAL
Established codes						
4A	Ecuadorian undergrad	1				
4B	No. weeks training	4				
4C	UK Masters student	1				
4D	No. weeks training	4				
6A	GNP staff training	6				
6B	No. weeks training	6				
8	SG - 3 weeks Dec 06	3				
10	Captive tortoise health monitoring/recording guide	1				
12B	Captive tortoise health database	1				
14B	Population Genetics group conference, Manchester, UK	1				
18B	Project featured in "Lonesome George & the battle for Galapagos", 1 hour, BBC4 8 th October 2006.	1				
20	Equipment for laboratory	£13,400				
23	Funding for conservation genetics workshop (AGA) Dec 2007	\$10,000				
New - Project specific measures						

Table 2 Publications

None scheduled for first 6 months of the project September 2006-March 2007

Type * (eg journals, manual, CDs)	Detail (title, author, year)	Publishers (name, city)	Available from (eg contact address, website)	Cost £

3.4 Progress towards the project purpose and outcomes

Purpose To provide capacity to respond to specific disease threats identified by the previous project (12-017)

The project is starting to deliver increased capacity to respond to WNV and Chelonian diseases in line with the project timetable, e.g. ongoing training for the project staff, new technical capabilities introduced. The imminent completion of the new laboratory annex building will add additional physical capacity. Indicators and assumptions appear to be appropriate at this point.

Purpose To fully embed disease surveillance in the Galapagos National Park strategy

The growing support and commitment of the GNP to the laboratory, together with endorsement of the conservation implications of the project outputs show that disease surveillance is becoming further embedded into the GNP strategy (see also next point below). Indicators and assumptions appear to be appropriate at this point.

Purpose To integrate wild tortoise health initiatives with the tortoise captive breeding programme

Modernisation of the tortoise breeding programme and consultation with staff responsible is underway. New protocols accepted by staff and endorsed by GNP. Indicators and assumptions appear to be appropriate at this point.

Purpose To build conservation education capacity within the Galapagos community and Latin American region

The basic preparatory measures for this work are in place, progress is on track for this point of the project. Indicators and assumptions appear to be appropriate at this point.

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

We continue to try and extend the impacts of the original project. The endemic biodiversity of Galapagos should now have reduced risk from the impact infectious diseases due to the enhanced physical capacity and expertise present in the GNP, the new knowledge generated from research outcomes and the transfer of research outcomes into policy. In addition to the increase in expertise and diagnostic capabilities of project staff we continued to support local stakeholders on lobbying for the implementation of the new national laws on biosecurity for aircraft flying to Galapagos that arose from work on WNV invasion risks in the original project. In the reporting period we have provided technical expertise to WildAid, GNP and CDRS who are lobbying and advising the Ecuadorian aviation authorities on the introduction of disinsection and fumigation procedures for all aircraft flying to Galapagos. Once introduced this will be a frontline preventative measure to reduce the chances of introduction of mosquitoes carrying devastating diseases for Galapagos wildlife such as West Nile Virus.

4. Monitoring, evaluation and lessons

Monitoring and evaluation of outputs and indicators have been described in sections 3.1-3.4. Since this post-project funding is a continuation of a previously successful project we have continued to use the successful work and management practices already in place.

Lessons: Some delay to the distribution of funds was experienced to due staff changes at the University of Guayaquil. These were solved through discussions mediated by our main Ecuadorian investigator, Dr Virna Cedeño, who has the local respect and experience to solve such matters easily. We are also mindful of potential future staff turnover within Ecuadorian staff at the laboratory, and of post-graduate training for these key individuals in Europe or North America to further enhance their professional capabilities. Therefore we have taken steps to identify potential new junior members of staff to work as interns and receiving training, and to find post-graduate training possibilities for our existing staff.

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

N/A

6. Other comments on progress not covered elsewhere

The project was invited to be a partner in 3 further grant applications. Firstly are a partner on an application made by Prof Patty Parker (Dept. Biology, University of St. Louis, Missouri, USA) to the National Science Foundation (NSF) PIRE scheme for a project investigating the evolutionary genetics of poxvirus in the Galapagos. If successful substantial amounts of laboratory work would be carried out in the project facilities in Galapagos, and the grant will provide funding to support Ecuadorian staff, consumables at the laboratory and travel funds for the UK project partners. Secondly we have also collaborated on a further grant application with the St. Louis institutions and the CDRS (value \$25,000) to support avian influenza surveillance in Galapagos under the Global Avian Influenza Network Surveillance (GAINS) initiative funded by the World Conservation Society (WCS) and US-AID. Work under this scheme is expected to take place in summer 2007. Finally, we are partners with the Dept. of Ecology and Evolutionary Biology at the University of Yale, USA, in an application for \$10,000 to the American Genetics Association that will support an additional workshop on conservation genetics for Ecuadorian students at the laboratory.

These collaborations demonstrate the growing interest in working with the laboratory from international scientists, that will both increase the capacity of the laboratory by providing new training opportunities for the staff, and will enhance the sustainability post-Darwin funding by providing additional income sources.

We would also like to take this opportunity to commend the performance of Dra Marilyn Cruz, the Galapagos laboratory veterinary pathologist, who has shown exceptional professionalism and dedication to the project over the last year. Although the success of the project is a team effort, she has made, and continues to make, outstanding contributions to the work. We believe that she would be an excellent candidate to receive post-graduate training in Europe, and would be able to further enhance her contribution to the project and Galapagos through this.

7. Sustainability

Due to the original phase, the project already has a high profile among stakeholders and potential users of the laboratory, nationally and internationally, including institutions responsible for the management of Galapagos, local government, national government, national and international universities (e.g. see collaborations above). We have continued to maintain these

relationships with the new Ecuadorian government, and also intend to increase the broader profile via the media.

The Correa administration has a relatively strong interest in biodiversity issues, particularly with respect to protecting Ecuadorian bio-resources and in dealing with the issues that recently led the Galapagos to be placed in the UNESCO list of at risk World Heritage Sites. At the time of the recent meeting with Ministry of Environment (see section 3.1) a moratorium was in place, at the direction of the Ministry of Environment, on the export of biological samples for research from Galapagos as it was felt that there was not sufficient scientific oversight of the permit system. In the meeting it was explained that the Darwin lab and staff would be able to evaluate these permit applications leading to an agreement to lift the moratorium. This demonstrates the emphatic recognition by the Ministry of the importance and contribution of the lab to Galapagos conservation. Similarly the Ministry also acknowledge the long term role the lab will play in addressing the issues required to remove the UNESCO at risk designation, left open the possibility of further government support for the lab once the Darwin funding finishes.

The Park and the University of Guayaquil have already committed to maintain the laboratory once the Darwin project has finished (as specified in the project MOUs), so the outputs, outcomes and impacts will be sustained. The support and commitment the laboratory has from the GNP and UoG demonstrate the recognition and importance these institutions give to biodiversity and the contribution of the outputs from this project to conservation.

8. Dissemination

As described in section 7 we achieved an important dissemination output with the Ecuadorian Ministry of Environment. These links appear to be strong and will be maintained through the active participation of the Galapagos National Park and Ministry in shared conservation goals for Galapagos in the future.

Once the teacher training component of the project is mature this will also constitute a valuable dissemination route to the Galapagos local community the should be sustainable in definitely, conservation lessons from the project will be built in to on going school programmes funded by the Ecuadorian government.

9. Project Expenditure

Table 3 Project expenditure during the reporting period (Defra Financial Year 01 April to 31 March)

Item	Budget (please indicate which document you refer to if other than your project schedule)	Expenditure	Balance
Rent, rates, heating, overheads etc			
Office costs (eg postage, telephone, stationery)			
Travel and subsistence			
Printing			
Conferences, seminars, etc			
Capital items/equipment			
Others			
Salaries (specify)			
TOTAL			

The costs of the new laboratory extension were less than originally estimated at the time of the grant application leading to a surplus of approximately £2600 in capital items (less than 10% of the total for this budget line). At the same time travel and conference/seminar costs were also under spent due to 1 less than expected trip from the UK to Galapagos taking place. The under spends were vired into salaries to account for higher than anticipated increases in salary costs. Salary costs were increased due to higher than anticipated local inflation, and the need to take on local interns for training (in preparation for possible future core laboratory staff turnover) and the need to ease extremely high workloads in the laboratory for existing staff.

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

Annex 1 Report of progress and achievements against Logical Framework for Financial Year: 2006/07

Project summary	Measurable Indicators	Progress and Achievements April 2006 - March 2007	Actions required/planned for next period
<p>Goal: <i>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</i></p> <p><i>The conservation of biological diversity,</i></p> <p><i>The sustainable use of its components, and</i></p> <p><i>The fair and equitable sharing of the benefits arising out of the utilisation of genetic resources</i></p>		<p>Galapagos should now have reduced risk from infectious diseases due to enhanced physical capacity and expertise in GNP, new knowledge from research outcomes and transfer of research outcomes into policy. We continued to support local stakeholders on lobbying for the implementation of the new national laws on biosecurity for aircraft flying to Galapagos.</p>	<p><i>(do not fill not applicable)</i></p>
<p>Purpose</p> <p>To provide capacity to respond to specific disease threats identified by the current project, to fully embed disease surveillance in the Galapagos National Park strategy, to integrate wild tortoise health initiatives with the tortoise captive breeding programme, and to build conservation education capacity within the Galapagos community and Latin American region.</p>	<p>New knowledge on the nature and prevalence of diseases and their vectors translated into practice.</p> <p>An operating plan for the Galapagos giant tortoise captive breeding programme integrating tortoise disease management, endorsed by the GNP authorities.</p> <p>Enhanced conservation science education capabilities of local teachers. Postgraduate students being trained from Latin American countries.</p>	<p>The project is starting to deliver increased capacity to respond to WNV and Chelonian diseases in line with the project timetable. The growing commitment of the GNP to the laboratory shows that disease surveillance is further embedded into GNP strategy. Modernisation of the tortoise breeding programme and consultation with staff is underway. The basic preparatory measures for the conservation education activities are in place. Assumptions appear to be appropriate at this point.</p>	<p><i>Capacity building:</i> complete lab annex, continue to run training for new and enhanced diagnostic protocols, WNV workshop; <i>Research & Monitoring:</i> continue research programmes and integration tortoise health with captive breeding programme; <i>Education:</i> work with teachers to develop educational programme and materials, teachers participate in part-time training. Masters students trained; <i>Dissemination:</i> Website updated, engage local and international media interest.</p>

<p>Output 1.</p> <p>Increased capacity of lab to deal with specific identified disease threats is expanded, and development of current programmes.</p>	<p>New findings endorsed by international scientific community and inform conservation strategy.</p>	<p>The completion of the new laboratory annex will enhance the capability of the Galapagos lab by providing much needed space to house its expanding activities, enhance capabilities for necropsy, other pathology investigations and to archive frozen material from many different projects in the archipelago. New diagnostic protocols e.g. sampling of live tortoise mycoplasma for culture and identification have been introduced to the lab. Similarly the ongoing training activities for project staff and are leading to greater capabilities for disease investigations, management of disease issues, and integration of the laboratory into the central operating strategy of the GNP. There are no significant issues regarding output level assumptions at this point.</p>
<p>Activity 1.1 Capacity building and training.</p>		<p>The laboratory core staff continued to receive on the job training and guidance from the UK partners and University of Guayaquil/Concepto Azul.</p> <p>The training workshop for WNV scheduled for February 2007 has been delayed to September 2007 after consultation with the project stakeholders (GNP and CDRS) who now wish this to be conducted as a broader risk assessment, response plan and simulation exercise under the the Galapagos wide Global Environment Facility management plan for invasive species.</p> <p>For the next reporting period, continue with ongoing training for lab staff, organise WNV workshop.</p>
<p>Activity 1.2 Research, Disease Monitoring and Conservation</p>		<p>Core research activities from previous project continuing, new diagnostic protocols e.g. sampling of live tortoise mycoplasma for culture and identification have been introduced to the lab. Sampling of birds for WNV introduced. Continue with this programme as per the logframe for the next period.</p>
<p>Output 2.</p>	<p>Annex operational and used in</p>	<p>Plans agreed and ground broken for foundations. After evaluating all</p>

Annex to existing lab for sample archive and necropsy room.	extended project.	possibilities it was decided to construct a standard building <i>in situ</i> rather than use a prefabricated building, since negotiations with local builders have permitted a more cost effective solution to be delivered, with more space and facilities for the same unit price. Construction will be completed by July 2007.
Activity 2.1. Build annex to pathology laboratory		Continue with construction, ensure annex is complete and operational by August 2007.
Output 3. Enhanced capabilities of project managers to translate research outputs in to conservation practice	Species conservation in Galapagos enhanced by input from research findings	Increased communication with technical department of the Park, with specific Park staff now responsible for liaison with laboratory. Regular reports on research activity at laboratory made to these staff with recommendations for action points. Key staff will participate in disease (WNV etc) workshops. See also outputs 1 & 4.
Activity 3.1. Workshops with Park staff		See activity 1.1.
Output 4 Operating plan for disease management in tortoise captive breeding programme.	Operating plan reviewed externally and implemented.	Captive breeding centre staff were instructed in new record keeping, information management and reporting protocols, which are now in place and being utilised. The data archives of the captive breeding centres are being reorganised and transferred to new databases compatible with the new protocols. Initial consultation with captive breeding programme staff have been made to design new implementation strategies for further discussion at a tortoise management workshop. Indicator applies once plan has be written but seems appropriate at this point
Activity 4.1. Begin modernisation of tortoise programme and training of staff.		See above for progress. For next reporting period continue with training and introduction of modernisation.
Activity 4.2. Development of operating plan		For progress see above. For next reporting period continue with

		consultation of stakeholders. Organise workshop.
Output 5 Conservation science taught by local teachers.	Participation of teachers in programme, local children value species conservation.	The main delivery period for this output is scheduled for later in the project, but progress has been made in discussing development of the programme with the stakeholders and identifying teachers who will participate. There are no significant issues regarding output level assumptions at this point.
Activity 5.1. Identify schools and teachers to participate		Identification of schools and teachers completed
Activity 5.2. Consultation on curriculum for teachers		Consultation on requirements for curriculum underway. In the next reporting period produce materials and begin training
Activity 5.3 Visits by schools to Galapagos laboratory		10 high school students on work experience lasting up to 1 month each. In November 2006 an open house day attracted ~100 children
Output 6 Graduates in masters programmes from other Latin American countries.	Participation of Masters students in the programme	The main delivery period for this output is scheduled for later in the project, but progress has been made in forming the necessary links. There are no significant issues regarding output level assumptions at this point.
Activity 6.1. Identify institutions to participate		Consultation underway
Activity 6.2. Ecuadorian conservation genetics workshop		Money obtained from American Genetics Association in collaboration with partners at Yale University to run an Ecuadorian conservation genetics workshop in Galapagos in December 2007 (approx 30 participants (students and professionals) expected).

Output 7 Media representation	Project featured in local media	We continue to seek appropriate media coverage. There are no significant issues regarding output level assumptions at this point.
Activity 7.1. National and International TV features		The project was featured and Dr Cedeño interviewed for the BBC television documentary “Lonesome George and the battle for Galapagos”, 1 hour, originally broadcast in the UK on BBC4 8 th October 2006.
Activity 7.2 Conference presentation		Genetic population structure of Galapagos mosquitoes and implications for disease epidemiology, presented at the Population Genetics meeting (an international conference) at the University of Manchester, UK, January 2007. Further conference presentations to be arranged for 2007-8 period.

Annex 2 Project's full current logframe

Project summary	Measurable indicators	Means of verification	Important assumptions
<p>Goal:</p> <p>To draw on expertise relevant to biodiversity from within the United Kingdom to work with local partners in countries rich in biodiversity but poor in resources to achieve</p> <ul style="list-style-type: none"> • 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 			
<p>Purpose</p> <p>To provide capacity to respond to specific disease threats identified by the current project, to fully embed disease surveillance in the Galapagos National Park strategy, to integrate wild tortoise health initiatives with the tortoise captive breeding programme, and to build conservation education capacity within the Galapagos community and Latin American region.</p>	<p>New knowledge on the nature and prevalence of diseases and their vectors translated into conservation practice.</p> <p>An operating plan for the Galapagos giant tortoise captive breeding programme integrating tortoise disease management, endorsed by the Galapagos National Park authorities.</p> <p>Enhanced conservation science education capabilities of local teachers. Postgraduate students being trained from Latin American countries.</p>	<p>Project reports and workshop reports involving partner organisations, publications in peer reviewed journals.</p> <p>Management plan documents and correspondence.</p> <p>Records of training workshops, and educational programmes, including materials. Increased number of school students taught conservation science. Graduates in masters programmes from other Latin American countries.</p>	<p>Researchers and managers use project findings to help minimise disease impacts on endemic species.</p> <p>Disease monitoring programme receives continued funding to maintain its activities. Note continuing funding from Galapagos National Park Service and University of Guayaquil is already agreed.</p> <p>Local schools continue to seek to teach conservation science.</p> <p>The demand for postgraduate training in conservation continues.</p>
<p>Outputs</p> <p>Capacity of lab to deal with specific identified disease threats is expanded, and development of current programmes.</p> <p>Annex to existing lab for sample archive and necropsy room.</p> <p>Enhanced capabilities of project managers to translate research outputs in to</p>	<p>New findings endorsed by international scientific community and inform conservation strategy.</p> <p>Annex operational and used in extended project.</p> <p>Species conservation in Galapagos enhanced by input from research findings</p>	<p>Papers in peer reviewed international scientific journals, output of data supporting conservation activities.</p> <p>Annual reports, peer reviewed papers, output of data supporting conservation activities.</p> <p>Annual reports, peer reviewed papers.</p> <p>Operating plan</p>	<p>Research and surveillance programmes generate data required for management plans.</p> <p>Annex operational within one year.</p> <p>Managers participate in training implement recommendations and take up methods for</p>

<p>conservation practice</p> <p>Operating plan for disease management in tortoise captive breeding programme.</p> <p>Conservation science taught by local teachers.</p> <p>Graduates in masters programmes from other Latin American countries.</p> <p>Media representation</p>	<p>Operating plan reviewed externally and implemented.</p> <p>Participation of teachers in programme, local children value species conservation.</p> <p>Participation of Masters students in the programme</p> <p>Project featured in local media</p>	<p>document published and distributed.</p> <p>Educational materials, school project reports</p> <p>Students pass their courses, teaching materials, reports</p> <p>Articles & recordings</p>	<p>knowledge transfer.</p> <p>Links to educational organisations and media are established (agreements are in place to do this via the Galapagos National Park Service).</p>
<p>Activities</p> <p>Capacity building and training.</p> <p>Research, Disease Monitoring and Conservation</p> <p>Education programme</p> <p>Dissemination of results</p>	<p>Activity Milestones (Summary of Project Implementation Timetable)</p> <p>Yr1: Build annex to pathology laboratory and run training workshops for new and enhanced diagnostic protocols; workshops for transfer of research outputs into conservation practice and tortoise health initiative. Yr2 Follow up training workshops</p> <p>Yr1: Implement new diagnostic procedures and surveillance for targeted pathogens, continue with previous research programmes. Implement integration of wild tortoise health initiative into tortoise captive breeding programme. Yr2: Continuation of year 1 with workshop to assess and develop the programme of integrating disease issues into conservation management of the Park. Production of scientific publications and finalised management plans.</p> <p>Yr1: Work with local teachers to develop educational programme and materials in conservation science. Teachers participate in part-time training programme held over a six month period. Masters students trained from Ecuador and other Latin American countries. Yr2: Teachers implement teaching of conservation with support from the project. Masters students trained from Ecuador and other Latin American countries.</p> <p>In each year: Annual reports and project website updated. Engage local and international media interest. Yr2 Presentation of results at international conference, workshops, papers submitted to international peer reviewed journals by 1 year after end of project.</p>		

Annex 3 onwards – supplementary material (optional)

A3.1 Plans for new laboratory annex

