

**Sustainable Management of the Black Land Crab,
Gecarcinus ruricola, Colombia (162/11/015)**

Annual report 2: April 2003 – March 2004



Darwin Initiative for the Survival of Species

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1. Darwin Project Information	

Project Ref. Number	162/11/015
Project Title	Sustainable management of the black land crab (<i>Gecarcinus ruricola</i>)
Country(ies)	Colombia
UK Contractor	Heriot-Watt University
Partner Organisation(s)	CORALINA, University of Liverpool, University of Papua New Guinea
Darwin Grant Value	148, 393
Start/End dates	April 2002 – March 2005
Reporting period (1 Apr 200x to 31 Mar 200y) and report number (1,2,3..)	Report 2: 1 April 2003 – 31 March 2004
Project website	To be constructed in Year 3
Author(s), date	Dr Mark Baine, 14 April 2004

2. Project Background

The Black Land Crab, *Gecarcinus ruricola*, is overexploited, yet understudied in the Caribbean, particularly in San Andres, Colombia where it is a symbol of cultural identity as well as a major source of protein and economic subsistence. The project aims to conserve, recover and ensure sustainable use of this species, involving local community participation.

3. Project Purpose and Outputs

As noted in the Project Logical Framework (Annex 2) the purpose of the project is to conserve, recover and ensure future sustainable exploitation of the black land crab in the San Andres Archipelago by developing management initiatives, education tools and studying the potential for terraculture of this species to help eliminate growing poverty, while serving as a model for regional action. Specific objectives occur in 4 key work areas: 1) Information gathering. The information base on *G. ruricola* will be improved, under the direction of the UK's leading land crab expert, by carrying out the biological and socio-economic research needed for management planning and to determine the validity of terraculture, including strengthening information management systems and developing an experimental terraculture site, if viable; 2) Management planning. A management plan to conserve and recover *G. ruricola* will be completed along with a socio-economic analysis that includes the feasibility of terraculture; 3) Implementation. Initiatives defined in the management plan will be put into place including strengthening of the policy and regulatory framework, initiation of a monitoring program for species conservation and recovery, establishment of a Black Crab Conservation Unit, and design of a model terraculture project, if proved viable; and 4) Training and education. CORALINA personnel/local community groups will be trained in resource management techniques, with the development of a public awareness campaign based on the habits, needs, and sustainable management of *G. ruricola*. In general terms (months 0-24) the following specific outputs have been achieved or are in the process of being achieved:

- A reference collection on land crab biology, exploitation, management and terraculture has been completed, comprising over 50 papers, manuscripts and books. It is continually updated;
- The project team continues to assess the distribution, abundance and size frequency of existing populations by sex and by island; investigate growth rate and age structure; survey habitats; and analyse ecological relationships. Spatial distribution

and abundance maps for the San Andres archipelago are in the process of being produced;

- The project team continue to determine timing and intensity of the annual breeding migration and return of postlarvae (the latter is very irregular and is insignificant in many years);
- The project team, working with the Christian University, are exploring some aspects of the viability and potential for culturing black crab through experimentation;
- Socio-economic information from stakeholders on users, markets, income, and harvesting patterns has been collected; the project team continues to gather information on catch levels and composition, and catch per unit effort;
- This socio-economic research is being analysed to assess the potential for a terraculture project;
- Information management systems are being developed to adequately store, apply, and ensure access to data;
- The above information will input to the development of a management plan including policies and actions for conservation, recovery, sustainable use, continuing research, monitoring, education, and community participation (months 18-30);
- An economic feasibility study and action plan including sustainable strategies for exploitation, terraculture, and marketing is currently underway (months 18-30);
- Contact has been established with regional organisations to spread information and investigate the potential for a regional network;
- Plans are in progress for the convening of a workshop involving local stakeholders to impart information obtained as a result of this project and to discuss a black crab management plan, the establishment of a Black Crab Conservation Unit, future terraculture studies, future monitoring and changing legislation;
- Researchers have been trained in the management of biological information and in community based resource management approaches; and
- Educational materials and events continue to be produced including posters, school visits, school curricula the publication of a collection of traditional lore, and publicity items (press releases, pamphlet, etc.). A documentary video has been commissioned.

There have been no significant changes to the project plan or outputs.

4. Progress

A delay to the start of the project in Year 1 meant that the first crab migration period (May 2002) was missed. The delay led to the postponement of training activities until year 2. This has not affected the general well-being of the project with 2 events to study in May 2003 and 2004, with training provided in advance. During the rest of year 1 (project starting in August 2002) an initial project meeting was held in San Andres to produce a more detailed project calendar. A reference collection was completed. Public awareness of the crab and its importance was increased through a significant level of educational activities. Biological surveys including ovarian maturity analyses, population structure and growth were initiated. Socioeconomic surveys were completed of crab catchers, crab sellers and crab consumers.

Annex 1 provides a summary of the progress over year 2 of the project against the logical framework. The project continues largely to plan. The table below provides an account of the project's major achievements through year 2.

Table 1

Achievement	Approach and methodology	Impacts/Results
Collection of biological and socio-economic data	<p>(1) Following set research protocols, sampling of crab population: size, sex, maturity, gonad ripening and egg laying, egg counts, 5m² quadrant sampling for stock abundance for both islands of San Andres and Old Providence. Observational analyses of migratory behaviour and occurrence of recruitment. Market sampling.</p> <p>(2) Following a set research protocol, analysis of growth, mortality, feeding and general behaviour of a small number of captive crabs in provisional enclosure.</p> <p>(3) Recording by catchers of catch, location, hours catching and catcher numbers.</p>	<p>(1) Database collation, leading to improved knowledge on the size and population structure of crabs on both islands. Contrary to commonly held views crabs do not seem to be smaller on San Andres. There are also many more small crabs on Providence, suggesting differences in past recruitment patterns. The reproductive cycle is becoming clearer, with mature females each producing at most one batch of eggs each season. Migratory behaviour is becoming clearer, and the patterns are both complex and unpredictable. Postlarval recruitment was not detected in 2003, so the 2004 results will be very interesting. The size range of individuals targeted within the catchery has been clarified for each island.</p> <p>(2) Information to aid in the assessment of terraculture feasibility. Ongoing.</p> <p>(3) Database collation to enable an assessment of the catchery with respect to sustainability. Community involvement.</p>
Training	<p>(1) 17 participants at 2 training courses (crab biology, data collection and economics; community based resource management) involving lectures, tutorials and practical on the job training. Christian University students and CORALINA personnel took part in the theoretical aspects; crab catchers and CORALINA personnel in the practical aspects. Theoretical training undertaken over 1 week. Practical training over 2- 3 weeks including sampling, measuring and data analysis.</p> <p>(2) Arne Britton began MSc in Marine Resource Management at Heriot-Watt University.</p>	<p>(1) Improved understanding of biological sampling and data analyses within San Andres. Improved understanding of outreaching and community involvement in resource management planning. Improved relationships between researchers and local communities.</p> <p>(2) Tertiary level education of CORALINA staff.</p>
Education	<p>(1) Documentary commissioned: 15 minute exploration of and crab management issues and the work of the Darwin Initiative.</p> <p>(2) Initiation of discussions on the development of a land crab module for inclusion in the school curricula, and the development of an education and social participation programme. Establishment of Crab Clubs, festivals and other events.</p> <p>(3) CORALINA and crab catcher workshops on aspects of crab ecology, catchery and social cartography.</p> <p>(4) Crab Lore Booklet completed.</p>	<p>(1) Education and awareness</p> <p>(2) Improved knowledge dissemination on the black land crab. Over 1500 participating schoolchildren.</p> <p>(3) Community involvement.</p> <p>(4) Entertaining look at the culture and history of the association between the land crab and islanders. Builds an appreciation of the importance of the land crab to San Andres.</p>

The educational component of the project has become very strong as the project develops. There is a very noticeable increase in awareness of the importance of the black land crab. Schools are also showing a high level of interest in both curricular and extra-curricular activities centring on the black land crab, helping to get across basic ecological principles.

The biological and socio-economic analyses are proceeding well, despite a number of hiccups in terms of personnel replacements. A number of crab catchers are also actively involved in the research, ensuring a sustained level of community involvement.

A tentative timetable is provided below summarising the main activities planned for Year 3.

Activity	Month, Year 3
Spatial distribution maps produced	May/June
Paper presented at CONCARIBE 2004	May
Site visit by UK personnel to assess progress of project and finalise year 3 activity plan	May/June
Migration monitoring	May/June
Production of Crab Lore Booklet and other educational materials	May/June
Continuation of terraculture experiments Continuation of biological sampling programmes and data analysis Continuation of catch monitoring	April - October
1 week workshop to discuss project results, recommendations, terraculture feasibility, future management and monitoring, and establishment of the Black Crab Conservation Unit. Visit by UK personnel to San Andres We-site produced	October/November
Production of the documentary video	October/November
Arne Britton completes MSc	October
Terraculture feasibility study produced and plans for a further proposal discussed, if viable	October
Management plan produced School curricula module finalised	January
Field manual on the land crab produced	February/March
Darwin Initiative Final Report	April/May 2005

5. Actions taken in response to previous reviews

On the whole, the Year 1 review was positive. The following points were raised and replied to:

- Larval studies: Although the original intention was to include research on larval development at sea, it was quickly decided that the effort involved and the hit and miss nature of recruitment, would far outweigh the small benefits that may be achieved. Efforts on terraculture would also concentrate at this stage on growth and survival in captivity of juveniles and sub-adults, rather than the technically more complex larval and postlarval culture.
- Population estimates: Information is being gathered and the project team intends to analyse this information in Year 3. We hesitate in making general inferences along the way, particularly as there is no baseline guidance data.
- Documentary: It was clarified that the funds allocated to the making of the documentary in the proposal were underestimates and hence the need for transferral of funds.
- Project financing: Comments made by the reviewer regarding UK/Developing Country situations in terms of reliance on funding and absorbing of project costs were challenged. Separate discussions between the DI Secretariat and the Project Leader clarified the issues involved. All due concerns were noted.

6. Partnerships

Heriot-Watt University and CORALINA continue to work well together. The main advantage is a historical relationship between both partners on other research projects. CORALINA also receives annual MSc students who undertake project dissertations in San Andres. Dr Richard Hartnoll from the University of Liverpool has fully integrated himself into the project team and is actively involved in e-mail correspondence on queries that rise throughout the research from CORALINA researchers. Dr Hartnoll has invested considerable additional time to this project over that originally envisaged. The Christian University continue to be involved with the project.

It should be noted that a number of personnel changes have occurred within the CORALINA project team. These changes will not affect the project's progress. The new Director of CORALINA has also collaborated with Heriot-Watt University before and indeed has spent considerable personal research time on land crab populations in Old Providence.

It should also be noted that the project leader Dr Mark Baine, has ceased employment with Heriot-Watt University, having taken up the post of Director of the Motupore Island Research Centre (MIRC), University of Papua New Guinea (October 2003). Dr Baine, under the auspices of MIRC has been sub-contracted by Heriot-Watt University to manage the project. This change in circumstances has been communicated to the DI secretariat and will not affect progress of the research.

Late in 2003, the project team made contact with Dr Chris Magin of Fauna and Flora International who have been leading another Darwin Initiative project "Development of a national strategy for sustainable wildlife use for the Commonwealth of Dominica" 2001-2004, of which one key species is the black land crab *Gecarcinus ruricola*. Both projects will compare notes and results over the coming year.

7. Impact and Sustainability

This project has had a high profile within Colombia and particularly in the San Andres Archipelago. This has been achieved through extensive publicity via radio, television and local press. The educational programme and organisation of social activities has also ensured that the project's objectives have been disseminated throughout the island. The involvement of schools and catchers in education and research indicates the level of involvement throughout the islands. These activities will be bolstered by the organisation of a workshop in Year 3, the production of the Crab Lore Booklet and finalisation of the documentary, which is at least guaranteed a number of airings on local television.

Attempts have been made to attract interest in the establishment of a regional network of organisations interested in land crab management. There was little response to this, however, possibly as this species is of limited distribution in the region and elsewhere does not carry the same cultural and economic importance. Contact will also be made with regional organisations to discuss ways of disseminating the results of the project through regional bulletins and web-sites. The local level of interest in this project remains high and a paper discussing the progress of the project will be presented at the CONCARIBE conference in Cartagena, Colombia in May 2004. Further contact will be made then with representatives from appropriate regional bodies and individuals.

With the future completion of a management plan and the enacting of legislation with respect to black land crab exploitation, the project will ensure continued regulation after the Darwin period. In addition, the completion of the experimental terraculture phase along with the

socio-economic analysis, and economic feasibility study and action plan will determine the viability and potential of this economic development alternative, forming the basis for a model project that is integrated with the principles of the management plan. This plan will include strategies that identify a clear pathway, over 3 years, for the transfer of training, implementation of full-scale sustainable use projects and introduction of immediate practical actions that result in species conservation and recovery. British expertise on land crabs, shared in the course of the project, will greatly improve the knowledge base and local capabilities for future long-term management of this species. A Black Crab Conservation Unit with members from CORALINA, the Christian University, the Agriculture Secretariat, trainees and participating community organisations will be established to collaborate in development and long-term implementation of the management plan and terraculture project, if viable. Drs Baine and Hartnoll will continue to be involved in an advisory context. The management plan and results of the terraculture experiments will be distributed throughout the region, thus ensuring as wide a relevant audience as possible for this model approach to the sustainable management of land crab resources.

8. Post-Project Follow up Activities (max 300 words)

(1) Based on the recommendations of the management plan, further research may be needed to assess the viability of terraculture of the black land crab in San Andres. This may also be of interest to the Commonwealth of Dominica, and could involve a joint submission – following on from 2 Darwin Initiative projects. One possibility is a study of larval and postlarval rearing and early release into natural habitat. A single hatchery could serve both areas.

(2) A detailed examination of spawning activity, larval development in the sea and subsequent recruitment. There is great inter year variation and a 2 year observation window is too short.

(3) A comprehensive tagging and monitoring programme to appreciate in more detail the behaviour and movement of this cryptic animal, particularly during the migration season. Studies on the Christmas Island red crab indicate how this might be achieved.

(4) The investigation and development of road bypasses (arches or tunnels) to allow safe passage for spawning crabs from inland forest areas to the sea and for returning juveniles, ensuring a reduction in large numbers of road kill during the migration season.

These projects are suitable for post-project funding as they will supplement the work of the present project and further highlight the importance of this species through international recognition of the threats and possible solutions. Information provided by such projects would aid in the conservation and sustainable management of this species and would also provide an immediate responsibility for the Black Crab Conservation Unit.

The Colombian agency CORALINA has a mandate that combines responsibilities of conservation, planning, management and education. CORALINA's mission is to manage, protect and recover the Archipelago's environment by using appropriate technologies for renewable resource use and by promoting sustainable human development in consultation with the community, in order to improve quality of life through participation and agreement. With approximately 33 staff, adequate facilities and black crab project experience and enthusiasm (including training) CORALINA will play a major role in follow-up activities in co-operation with the Black Crab Conservation Unit.

9. Outputs, Outcomes and Dissemination

Table 1 provides details on project outputs accomplished during Year 2 of the project.

Table 1. Project Outputs (According to Standard Output Measures)

Code No.	Quantity	Description
2	1	CORALINA representative Arne Britton currently completing MSc in Marine Resource Management at Heriot-Watt University
4c	2	2 MSc dissertations undertaken in San Andres related to the DI research by UK students on the MSc Marine Resource Management (Michael Richmond and Jorji Frederiksen)
4d	40 weeks	20 weeks for each student
6a	17	17 Colombian students and CORALINA staff receive training on crab biology, data analysis and economics; and community based resource management
6b	17	22 weeks of training (17 theoretical and 5 practical)
7	2	2 sets of course notes for the above training blocks
8	8	MB and RH over 2 visits in May and October 2003
18c	3	TV interviews which were aired
19c	14	Radio interviews or news bulletins aired

Originally perceived outputs for Year 2 have been obtained. Additionally, 2 MSc dissertations were undertaken in San Andres by UK students related to (1) level of understanding of crab catchers of resource management tools, and (2) reproductive behaviour during the annual crab migration. The majority of intended outputs should be achieved in year 3. Extensive progress has already been made in attaining certain outputs e.g. crab lore booklet, school curricula module. The formation of a regional network may not be achieved given the lack of responses to an initial exploratory letter. This will be investigated further at the CONCARIBE meeting in May 2004.

Dissemination activities have been discussed throughout the report. In summary the following have been achieved in Year 2:

- Paper being prepared for presentation at CONCARIBE 2004, Cartagena.
- Initial discussion on the production of a web-site.
- Letter, introducing the project and exploring a possible regional network, distributed to over 30 organisations including the Island Resources Foundation, Caribbean Conservation Agency, IOCARIBE, Caribbean Natural Resources Institute, Centre for Tropical Conservation and the Caribbean Network of Integrated Rural Development.
- Letter prepared for distribution to regional networks seeking permission to use their organisations to distribute project results and information.
- Dissemination of information on the project through local media.
- Finalisation of the Crab Lore Booklet and other publicity material.
- Day of the Crab festival.
- Development of a draft school curricula module.
- Implementation of a black crab education and social participation programme in schools and involving over 1500 children: talks, arts, theatre, music, traditional use workshops, field trips and laboratory work.
- 12 Black Crab Clubs established with over 250 members.
- 14 local radio and 3 local television slots.

Dissemination activities will be continued after the project finishes. The Black Crab Conservation Unit (BCCU) will continue such work in collaboration with CORALINA, who see education as a major part of their remit. The curricula module will be in place, the school educational programmes and the Black Crab Clubs will continue. The Day of the Crab festival (one day of various educational events and fun activities) is now well established. The BCCU will control regional dissemination of the results of future research and monitoring in terms of crab ecology and the catchery. CORALINA will cover their own costs in terms of the educational component and work with local communities. The BCCU will seek funding for future research and education programmes.

There are no major publications resulting from this research yet. Year 3 will see the production of a paper for CONCARIBE 2004, the preparation and submission of 3 papers for peer review journals, the production of the Crab Lore Booklet, and the finalisation of the management plan, terraculture feasibility study and a manual on crab biology, ecology and terraculture.

Table 2: Publications

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

10. Project Expenditure

Project expenditure during Year 2 is detailed in Table 3. It should be noted that a DEFRA letter of 11 June 2003 approved the carry over of monies unspent from Year 1. It was previously agreed that of the unused labour funds for CORALINA would be transferred to the CORALINA staff budget for Years 2 and 3 and that the remainder would aid in the funding of the documentary, if necessary. The changes are highlighted in **red** in the table below. It should also be noted that DEFRA approval was granted on 24 January 2004 for the transfer from the excess T&S from year 2 to cover an extra 2 weeks of Dr Hartnoll's time*.

There have been no major deviations in the budget. Positive balances reflect wise use of funds.

Table 3: Project expenditure during the reporting period (01 April to 31 March)

Item	Budget	Expenditure	Balance

11. Monitoring, Evaluation and Lessons

The project is directed and managed by Dr Baine, who is in constant e-mail contact with all partners and requests regular progress reports on tasks as they proceed. Progress reports are also requested prior to DI submissions. Dr Hartnoll also maintains constant e-mail contact with the scientific team in the project, developing and adapting research protocols for simple interpretation and implementation. The UK researchers visit San Andres at least twice a year to assess progress in the field (usually May and October). Comprehensive project meetings are held then. In San Andres, Ms Grandas is the CORALINA project manager, under the supervision of Ms Liz Taylor, CORALINA Director. Ms Grandas is responsible for ensuring that tasks are completed on the ground. Comprehensive records are kept of biological and socio-economic surveys, educational events, training participants and media coverage. Minutes are taken at all meetings with local stakeholders.

The truest measure of the success of the project so far is in the interaction with local stakeholders and islanders. The educational component is undoubtedly a success as reported elsewhere in this report (year 2 alone seeing 12 clubs established, 1500 children involved in the educational programme, 17 people undergoing training, 2 MSc dissertations etc). The fact that crab catchers and processors are working closely with the project team in workshops and on gathering not only catchery related data, but also catchery independent scientific data, is a positive reflection of the interest in the project and perhaps provides an indication of future proactive management planning. A workshop planned for October/November 2004 to disseminate the results of the research and discuss management and policy, should further allow the project team to define the impact of the project in terms of willingness to help structure and support future management measures as well as support the formation of the Black Crab Conservation Unit.

The project team have been encouraged by the willing involvement of local islanders so far in the project. The team are positive that this will be borne into Year 3.

12. OPTIONAL: Outstanding achievements of your project during the reporting period (300-400 words maximum)

■ I agree for ECTF and the Darwin Secretariat to publish the content of this section

The level of willingness by the islanders of San Andres to embrace the aims and objectives of this project is a strong source of encouragement for the project team. The level of involvement includes moves to integrate the results of the research into local school curricula, the formation of a local network of black crab clubs, active participation in educational and social events such as the Day of the Crab, the potential establishment of a theatre group, and the involvement of crab catchers in workshops and catchery dependent and independent data collection. The project team recognise that this level of involvement is high and that the profile of the black land crab within San Andres has increased significantly during the project lifetime. It is hoped that this momentum will continue in the final year of the project and after its completion, particularly in relation to the integration of scientific results with social issues in the adoption of appropriate management measures, designed to protect both the species and the islanders' way of life, for they are culturally bound together.

Annex 1 Report of progress and achievements against Logical Framework for Financial Year: 2003/2004

Project summary	Measurable Indicators	Progress and Achievements April 2003-Mar 2004	Actions required/planned for next period
<p>Goal: 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 Conserve, recover and ensure future sustainable exploitation of the black land crab in the San Andres Archipelago by developing management initiatives, education tools, and studying the potential for terraculture of this species to help eliminate growing poverty, while serving as a model for regional action</p>	<p>1.1 Local, national, and regional information access</p> <p>1.2 Species management plan distributed</p> <p>1.3 Policies and regulations</p> <p>1.4 Terraculture project (1) designed and submitted for funding, if viable</p> <p>1.5 Resource managers and stakeholders applying training</p>	<p>Web-site under consideration. Letter distributed to regional organisations assessing the potential for the establishment of a regional network. Little response.</p> <p>CORALINA personnel and crab catchers using training to collect biological data on black crab populations and the catchery. 14 local radio interviews/news bulletins. 3 local TV interviews.</p>	<p>There does not seem to be a wide interest in the region, possibly due to the restricted distribution of the black land crab. Web-site to be produced. Black crab workshop involving all stakeholders to be held. Management plan to be produced and distributed. Review of existing legislation to take place and enactment of new legislation if deemed necessary. Assessment of the feasibility of terraculture and design of a project proposal, if viable. Formation of the Black Crab Conservation Unit.</p>
<p>Outputs</p>			
<p>Information base improved and research undertaken</p>	<p>References, biological and socio-economic data, culture experiments, database set up</p>	<p>Reference collection produced and updated. Size stratified samples collected for analysis. Monthly maturity analyses undertaken. Assessments of fecundity undertaken. Market sampling undertaken. Experiments undertaken to assess most appropriate stock assessment technique. Stock assessment protocol decided and sampling is ongoing.</p>	<p>Similar biological research has been undertaken in Dominica and comparison of results will be pursued. Biological analyses will continue throughout year 3 where necessary. Transect sampling was deemed inappropriate for population assessments because of easy escape. Baiting using coconut halves were unsuccessful. Spatial distribution maps to be produced. 2004 migration event to be studied.</p>

		<p>2003 migration event studied including the production of an MSc dissertation. Return of postlarvae monitored. Small scale rearing facility established to monitor crab growth and health in captivity. Monitoring of catch, effort and CPUE undertaken with the participation of local catchers. Data being inputted on appropriate databases.</p>	<p>Return of postlarvae to be monitored. Small scale terraculture feasibility studies to assessed and re-evaluated. Monitoring of catch etc to continue until at least 1 year's data is collated. Databases updated.</p>
Management planning to conserve, recover, and promote sustainable species use completed	Management plan, economic study	Continual analysis of biological and socio-economic data.	Management plan to be developed. Terraculture feasibility study to be completed.
Implementation of management initiatives	Regulations, terraculture viability, monitoring	Letter sent to regional organisations assessing potential for a regional network. Potential organisational members of black Crab Conservation Unit identified.	Poor response to letter. Legislation to be reviewed and alternatives discussed. If viable, a terraculture proposal will be developed. Black Crab Conservation Unit to be established. Lon term monitoring plan for crab populations and catchery to be recommended in management plan.
Training and education of local resource managers and stakeholder groups undertaken	Resource management and terraculture training, MSc qualification, education awareness materials	<p>17 participants on training blocks organised on (1) crab biology, data collection and economics, and (2) community based resource management. Continuous on the job training when UK researchers in host country. CORALINA staff member began MSc in Marine Resource Management at Heriot-Watt University. Documentary video commissioned, majority of images collated and draft commentary produced. Draft school curricula module developed and presented to school representatives. Development of a black crab education, and social participation programme for children,</p>	<p>Resource management and terraculture will be discussed as part of the planned workshop in year 3. Training will form part of this workshop. MSc to be completed in year 3. Interviews and images to be collated for completion of documentary, with subsequent editing and production. School curricula module to be finalised in year 3 and implemented in 2005. Educational and social participation programme to continue through year 3. Training programme to be defined and developed on co-operative establishment and processing for crab catchers. Children of crab catchers to be engaged in</p>

		<p>implemented in 10 institutions and involving the participation of 1500 children. Day of the Crab festival held. 12 Black Crab Clubs established. 6 workshops held with crab hunters and processors on social cartography, distribution and abundance, capture areas, migration and return of juveniles, and commercialisation (attended by 40 catchers and processors). 20 home visits also made. Crab Lore Booklet completed. Posters. Calendars, stickers and flyers being designed. MSc dissertation completed on the level of understanding of resource management measures by crab catchers.</p>	<p>the possible establishment of a theatre group (based on crab lore). Printing of Crab Lore Booklet has been delayed slightly while clarification is sought on Colombian regulations regarding printing of material by government organisations. Posters, calendars, stickers and flyers to be produced. Paper to be presented at CONCARIBE 2004 in May 2004.</p>
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Note: Please do NOT expand rows to include activities since their completion and outcomes should be reported under the column on progress and achievements at output and purpose levels.

Annex 2: Project Logical Framework

<i>Project summary</i>	<i>Measurable indicators</i>	<i>Means of verification</i>	<i>Important assumptions</i>
<p><i>Goal</i></p> <p>To assist countries rich in biodiversity but poor in resources with the conservation of biological diversity and implementation of the Biodiversity Convention</p>		<p>Research reports and database</p> <p>CORALINA environmental management reports: regulatory control and monitoring</p> <p>Research reports, stakeholder meeting records, management plan</p> <p>Economic Action Plan, Model Terraculture Project (if viable)</p>	<p>a) Political and institutional will exists for sustainable management</p> <p>b) SINA supported at national/departmental levels</p> <p>c) Migration to San Andres controlled in accord with existing legislation</p> <p>d) Traditional methods and cultural values respected</p> <p>e) Future financial backing</p>
<p><i>Purpose</i></p> <p>1. Conserve, recover and ensure future sustainable exploitation of the black land crab in the San Andres Archipelago by developing management initiatives, education tools, and studying the potential for terraculture of this species to help eliminate growing poverty, while serving as a model for regional action</p>	<p>1.1 Local, national, and regional information access</p> <p>1.2 Species management plan distributed</p> <p>1.3 Policies and regulations</p> <p>1.4 Terraculture project (1) designed and submitted for funding, if viable</p> <p>1.5 Resource managers and stakeholders applying training</p>	<p>1.1 Web site postings, records of contact with IOCARIBE, IRF, CCA, etc.</p> <p>1.2 File copies, mail log</p> <p>1.3 Regulation(s) enacted by CORALINA (legal registry)</p> <p>1.4 Project document, submission letters, mail log</p> <p>1.5 Reports of CORALINA, BCCU, and multiplier activities</p>	<p>f) Regional involvement</p> <p>g) Institutional stability and funding of CORALINA maintained</p> <p>h) Regulations enforced, police/authority support</p> <p>i) Local community interest in sustainable use and terraculture</p> <p>j) Trainees remain at local institutions in archipelago</p>
<p><i>Outputs</i></p> <p>1. Information base improved and research undertaken</p> <p>2. Management planning to conserve, recover, and promote sustainable species use completed</p> <p>3. Implementation of management initiatives</p> <p>4. Training and education of local resource managers and stakeholder groups undertaken</p>	<p>1. References, biological and socio-economic data, culture experiments, database set up</p> <p>2. Management plan, economic study</p> <p>3. Regulations, terraculture viability, monitoring</p> <p>4. Resource management and terraculture training, MSc qualification, education awareness materials</p>	<p>1. Catalogue, research reports, maps, experimental site report, database</p> <p>2. Minutes, study document</p> <p>3. Draft documents, reports, database records</p> <p>4. Certificates, reports, attendance records, degree certificate, dissertation, video, poster, collection of black crab lore, publicity items</p>	<p>k) Adequate baseline data</p> <p>l) CORALINA Board approves management plan</p> <p>m) Good relationship b/w CORALINA/stakeholders</p> <p>n) Training/MSc completed</p> <p>o) Education materials well distributed</p> <p>p) Interest in producing and airing video and publishing press releases</p>
<p><i>Activities</i></p> <p>1. Lit search, surveys, socio-economics, stakeholder consultation; database, experimental terraculture site</p> <p>2. Management and economic study/action plans</p> <p>3. Regulations, terraculture project, BCCU, monitoring program, regional contacts</p> <p>4. Training programmes; crab lore, documentary video and publicity material</p>	<p>1. Months 1-36</p> <p>2. Months 18-30</p> <p>3. Months 25-36</p> <p>4. Months 1-36</p> <p>Project Expenditure</p>	<p>1. Task assessment forms (TAFs), budget reports, annual project report</p> <p>2. Task assessment forms (TAFs), budget reports, annual project report</p> <p>3. Task assessment forms (TAFs), budget reports, annual project report</p> <p>4. Task assessment forms (TAFs), budget reports, annual project report</p>	<p>q) Sufficient/timely human and financial resources available to CORALINA</p> <p>l) Timely provision of information and data by relevant bodies</p> <p>m) Good communication between UK and Colombian organisations</p> <p>n) Prompt disbursement of funds and efficient procurement</p>

