

Darwin Initiative for the Survival of Species

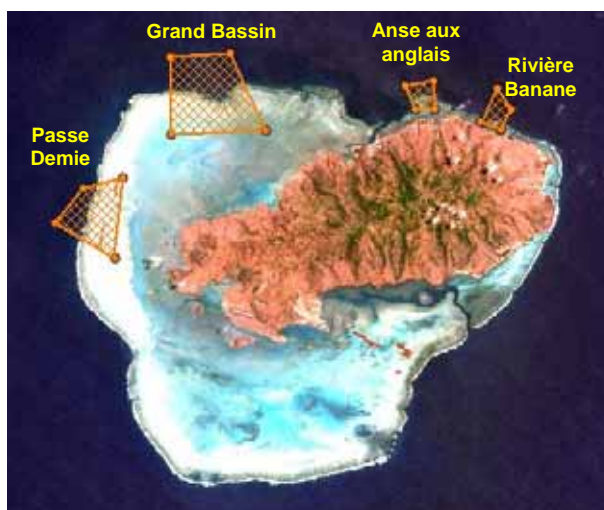
Final Report

1. Darwin Project Information

Project Reference No.	162/13/027
Project title	Developing reserves for biodiversity conservation and sustainable fisheries in Rodrigues
Country	Mauritius
UK Contractor	Newcastle University
Partner Organisation (s)	Shoals Rodrigues (primary collaborator); Fisheries Research and Training Unit (FRTU), Fisheries Protection Service (FPS), National Coastguard, Rodrigues Regional Assembly (RRA)
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Project website	www.ncl.ac.uk/tcmweb/tmr/aje_darwin_rodrigues.html http://www.shoalsrodrigues.net/
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2. Project Background/Rationale

The project is located on the island of Rodrigues (a semi-autonomous region of Mauritius) in the western Indian Ocean. Fishing is one of the largest employment sectors on Rodrigues, as there is a lack of industrial development and tourism is in its infancy. Nearly 20% of the total workforce are full-time, registered fishers, with a further 2000 people fishing on a casual basis. Subsistence fishers, who operate almost entirely in the 240 km² lagoon surrounding Rodrigues Island, are already amongst the poorest members of the community, and the situation looks set to worsen if the lagoon fisheries continue to decline. By working with stakeholders to develop a strategy that will allow lagoon fish stocks to recover and be exploited more sustainably, this project seeks to support the livelihoods of the fishing community.



The project set out to assist the Rodrigues Regional Assembly (RRA) in their goal of establishing a network of four marine reserves in the northern Rodrigues lagoon (see map) and is evaluating further resource management strategies which can help to protect the unique biodiversity of the island's coral reef ecosystem and to improve the sustainability of the artisanal fisheries. An integral part of the project purpose was to utilise UK expertise to build local capacity in marine and fisheries science skills in Shoals Rodrigues (a local NGO) and in the Fisheries Research and Training Unit (FRTU) and Fisheries Protection Service (FPS) of the government. Raising environmental awareness across the community (with a

focus on both schools and fishers) in order to influence attitudes towards biodiversity conservation was a further project objective. Capacity building, education and development of alternative livelihoods for fishers affected by reserve implementation are all essential to the long term success of the marine reserves. A key part of the project has been convincing the RRA that without serious consideration of alternative livelihoods, the reserves will never be more than “paper parks”. In parallel, with the Darwin Initiative, there was a UNDP funded project to establish a large Marine Protected Area (MPA) in the southern lagoon. The Darwin funded training and capacity building have provided crucial support to this project and the two projects together will provide an integrated set of networked MPAs to protect biodiversity in the lagoon of Rodrigues (including about six endemic fish species and an endemic coral).

The need for the project arose from discussions between the RRA and Shoals Rodrigues in 2002 on how to respond to the National Environmental Action Plan (2000-2010) of the Government of Mauritius. This had identified deterioration of marine systems and degradation of the coastal zone as major national environmental problems, and advocated as mitigation measures the reduction of fishing activities, the establishment of protected areas, and the expansion of coastal zone monitoring activities. The NEAP also identified the need to acknowledge the unsustainable nature of the fisheries as currently conducted and to strengthen conservation programmes. Further, the National Environmental Policy specified the intention of the Government to endeavour to sustain and promote environmental education programmes at all levels. The Darwin project was thus devised under the direction of *Shoals Rodrigues* to address: 1) research into the status of the lagoon fisheries, 2) monitoring of both the lagoon habitats and the principal fisheries, 3) environmental education and public awareness of marine habitation degradation and fishery issues, 4) continuing consultations with fishers and other stakeholders who would be affected by the reserves, 5) gazetting and establishment of the marine reserves, and 6) instigation of projects to develop alternative livelihoods for affected fishers.

3. Project Summary

The purpose of the project was to improve the protection of Rodrigues’ marine biodiversity and its fisheries management. There were four outputs:

- 1) Marine protected area network launched,
- 2) The understanding of Rodrigues’ marine environment improved through research and monitoring,
- 3) Fishing practices amongst local fishers improved, and
- 4) Capacity for marine research, monitoring and education built in local institutions.

The project was subject to a mid-term review in late 2006 and a suggested revision of the project’s logframe was developed by the reviewer in collaboration with *Shoals Rodrigues* staff and the project leader. We also saw and commented on a draft of the mid-term review before its submission to the Darwin Secretariat. The review was a helpful exercise for us. However, we expected some official feedback concerning the review (see section 5 of the 2nd Annual Report and section 3 of the 3rd Half-Year Report) which would indicate whether the revised logframe was accepted by the Darwin Secretariat and how funding implications of suggested changes would be addressed. This was not forthcoming although we were told informally by ECTF to go ahead meanwhile with the revised logframe. We will thus report against the revised logframe (Appendix V) but have included the original logframe as Appendix VI.

The revised logical framework does not depart greatly from the original but is better structured, has less confusion of activities with outputs, and clearer progression from outputs to purpose. It also recognises that a key Darwin legacy, in terms of local capacity to protect biodiversity, is the survival and development of the partner NGO, *Shoals Rodrigues*, which comprises the island’s sole repository of expertise in marine environmental research, marine conservation education and public awareness raising.

CBD articles 7 (Identification and monitoring), 8 (In-situ conservation), 10 (Sustainable use of components of biological diversity), 12 (research and training) and 13 (Public education and awareness) best describe the project.

Output 1. A marine protect area network has been launched after extensive stakeholder consultations with 4 marine reserves gazetted, the Rivière Banane Marine Reserve demarcated, funds for demarcation of remaining three reserves obtained, and funds for developing alternative livelihoods secured for two new NGOs set up by Rivière Banane fishers. In addition, the skills of *Shoals Rodrigues* are being called upon for the Community Participation Campaign (CPC) for the southern lagoon MPA (being funded by UNDP). The draft *Management Plan for the Rivière Banane Marine Reserve* been submitted to the Monitoring Committee for the Rivière Banane Marine Reserve and funding from the Decentralised Cooperation Programme run through the Government of Mauritius has been obtained for the education and socio-economic research surveys needed to develop the management plans for the remaining reserves. Thus this output has been largely achieved, despite the problems with the late gazetting of the reserves.

Output 2. The fisheries and habitat monitoring surveys of *Shoals Rodrigues* have improved our understanding of the status of the fisheries and the lagoon habitat, demonstrated that overfishing is clearly taking place, and shown that mesh-size changes for the important seine-net fishery would not be a useful option. They suggest that a combination of the marine reserve network and better enforcement of fishing regulations against illegal fishers are the best ways forward to conserve the biodiversity of the lagoon and promote fishery sustainability. Good collaboration has been achieved with the MPA project both in terms of the CPC (see above) and use of the habitat monitoring data to assist zoning of the MPA. Although the training of individuals from the partner agencies (*Shoals Rodrigues*, FRTU and FPS) proceeded well and was, according to feedback, found useful, the attempts at joint monitoring between *Shoals Rodrigues* staff and FRTU staff at fish landing sites was marred by the 85% non-appearance of FRTU enumerators at sites they were supposedly monitoring. When apprised of the situation early on, the Head of FRTU became defensive but did nothing to rectify the problem. Thus the attempt to build capacity within FRTU as well as within *Shoals Rodrigues* had limited success. This output was thus largely achieved, apart co-authored outputs with FRTU.

Output 3. The problem of improving fisher practices was tackled in various ways from education of children in marine conservation (*Club Mer*, visits to and from schools), English, French and Creole posters, fisher education sessions, radio broadcasts, and stakeholder sessions to promote alternative livelihood schemes for those fishers likely to be affected by marine reserve implementation. In addition a 5-day international workshop, entitled “*A Regional Perspective on MPAs in the Western Indian Ocean*”, was held in May 2007. This brought together 75 delegates from 12 countries to discuss the issues of unsustainable marine resource use and how MPAs can be used as effective management tools. The workshop was a great opportunity for Rodrigues delegates to learn lessons from MPA managers throughout the region and further afield (e.g. Sénégal, India, St Lucia). Highlights of the workshop included a visit to the Rivière Banane Marine Reserve and a stakeholder meeting by Creole speaking delegates (Seychelles, Mauritius, Madagascar, Comores) with local Rodriguais fishermen affected by the new reserves. The WIOMER MPA Managers' Forum, was also successfully established at the workshop and now networks MPA managers from Mauritius, Rodrigues, Seychelles, Comoros, Madagascar and La Réunion. It is too early to really tell whether output 3 has in fact been achieved but with the reserves in the process of implementation (see output 1) and groups of fishers banding together to develop alternative livelihoods at Rivière Banane, the outlook is promising.

Output 4. The capacity for marine research, monitoring and education was successfully built within *Shoals Rodrigues* with lesser impacts in FRTU, FPS and the staff of the UNDP MPA project. Through the contacts and prestige generated by the MPA workshop in 2007, Shoals has a higher profile in the region and with international conservation NGOs. It is part of the WIOMER MPA Managers' Forum, and networks regionally within WIOMSA, IOC and the European Union's Regional Programme for Coastal Zone Management of the West Indian Ocean Countries (ReCoMaP). Although (apart from dive training) there was no Darwin budget item to implement the formal training of 75% of Shoals staff suggested by the mid-term review, this excellent recommendation was pursued and funds were successfully obtained from outside to allow over 50% of the Rodriguan staff to undergo CPD training (see section 4).

Two of the Output 4 Measurable Indicators, which arose from the mid-term review, need further explanation as they were not accomplished. There was long discussion about setting up a MOU between Shoals and the RRA and one was drafted. A prime aim of this was to put Shoals on a firmer institutional and financial footing and reduce uncertainty. However, it became apparent that Shoals' strength and a key source of its credibility with fisher communities was its independent, non-governmental status and that any perceived tightening of its relations with the RRA (and thus also with whichever party – *Mouvement Rodriguais* or *Organisation du Peuple Rodriguais* – was in power) would alienate it from many people and foster distrust of its motives. It was also apparent from discussions with the RRA that such an MOU was seen by them as a way of having more control over *Shoals Rodrigues*. For example, the RRA was clearly annoyed when Shoals came out publicly against the sea cucumber fishery in late 2006 and early 2007. Thus the MOU was abandoned. Following the mid-term review, a 5-year development plan for Shoals was started by the Director, Eric Blais, but having made the decision to leave Shoals in August 2007, it was decided that this should pass to his successor Dr Marc Staljanssens who arrived in October 2007. Marc had clear ideas about how Shoals should move forward but left in early 2008 so this indicator remains in abeyance.

Perhaps the greatest achievements of the project were 1) showing the RRA that the only way forward to enable fishing pressure and habitat degradation to be reduced in the lagoon was to foster alternative livelihoods for fishers, and 2) initiating the process of fishers gathering into "Associations" (NGOs) and then obtaining funding to allow them to set up their chosen livelihood options.

4. Scientific, Training, and Technical Assessment

This section starts by outlining the training, research and capacity building visits by UK consultants on the project, then summarises the fisheries and habitat monitoring research activities of *Shoals Rodrigues*, then outlines the Shoals education campaign, which included focused fisher education, training and consultation sessions (stakeholder meetings), and finally discusses dive training.

Training, research and capacity building visits by UK consultants

The project started on 1 February 2005. Dr Alasdair Edwards (Newcastle University) and Dr Fiona Gell (Wildlife and Conservation Division, Isle of Man) made an initial visit to Rodrigues from 28 February to 15 March 2005. In discussion with the Shoals Rodrigues management team, priorities were set, fisheries and habitat monitoring programmes were planned with input from Dr Edwards and fisher education and consultation programmes were planned with input from Dr Gell.

A plan for developing a strategy for the management of the four proposed marine reserves, using community consultation and stakeholder participation, was put together (Gell, 2005) following review of progress so far, discussions with FRTU, review of Shoals fisher training programmes, a presentation to the Rodrigues Regional Assembly (RRA) Coordinating Committee for Fisheries and Marine Resources, and a meeting with UNDP in Mauritius (which is coordinating the establishment of the Rodrigues southern lagoon MPA).

Dr Edwards reviewed the status of the Shoals fisheries and habitat monitoring programmes and made recommendations as to how these should develop following the establishment of the marine reserves (Edwards, 2005). Both UK visitors conducted training for Shoals, FRTU and FPS staff. Dr Edwards focused on training in data collection and analysis for fisheries and how FRTU could utilise their data for management. Dr Gell focused on why marine reserves are needed, the benefits they provide and what is needed to make them work, drawing on lessons learnt from marine reserve successes and failures around the world. Both worked with Shoals staff in the field to review habitat, coral and fish survey techniques and test alternative methods. (See Appendix III for reports cited.)

In order that the impact of the marine reserves can be evaluated, a programme of carefully focused monitoring of selected fish species was needed. To teach the necessary techniques and instigate such monitoring, Dr Charles Anderson (Atoll Wildlife) visited in September 2005 and again in March 2006 carrying out training in estimating fish lengths underwater. The

training sessions were attended by 3 Shoals Rodrigues, 6 FPS and one FRTU staff. Four in-water snorkelling sessions were held during the first visit and five sessions during the second, during which time all participants improved in their ability to accurately estimate fish lengths (Anderson, 2005, 2006). The FPS staff were very keen to continue the training after the first session and further sessions were organised by Shoals staff. The training showed the clear need for “calibration” training dives before each annual census of fish sizes. Twelve species were eventually chosen for size monitoring (Anderson, 2006) and have allowed pre-closure baselines to be established for the reserve areas.

The snorkel training greatly increased the in-water confidence of some of the FPS trainees who subsequently used their new-found skills to retrieve and confiscate illegal nets and other fishing gear. Before this training, those fishing illegally would just dump their gear underwater when a FPS vessel was seen to be approaching and then retrieve it later when the coast was clear. Now the FPS officers are able to search underwater and retrieve and confiscate illegal gear. A major concern of registered (legal) fishers is the scale of illegal fishing as this undermines their livelihoods. Anything which contributes to making the FPS more effective, reduces pressure on the lagoon fish resources.

Following the initial training in 2005, Mr Sylvio Perrine, then in charge of the statistics collection at FRTU, requested more training from Dr Edwards. The Darwin Secretariat allowed us to carry forward c. £1700 of unused funds from FY 2004/05 to enable a second visit to Rodrigues in early 2006 for detailed discussions of FRTU needs and to undertake more database and field training with Shoals. The discussions led to FRTU asking for assistance to develop an Access database to automate and speed up their fisheries statistics work and Dr Edwards agreed to help with this and carry out further training in 2006. However, Mr Perrine, who had just been promoted to head the whole unit, was never subsequently able to find time to allow this collaboration to develop as his previous post was not replaced, so he was trying to cover two jobs.

Dr Gell made her second visit in early 2006 and developed further recommendations for the management strategy for the marine reserves relating to: 1) awareness raising, 2) stakeholder concerns, 3) responsibility for reserve implementation, 4) the intermediary (between RRA and fishing communities) and facilitating role of *Shoals Rodrigues*, and 5) the urgent need for research into alternative livelihoods (Gell, 2006). She also met with FRTU to develop a collaborative monitoring programme of the basket trap and line fisheries; gave a presentation to *Club Mer* students about marine reserves and a presentation on “Key issues in marine reserve development”, concentrating on the need for enforcement and alternative livelihood projects to an audience of FRTU, FPS and the National Coastguard. This talk was fortuitously also attended by leader of the opposition *Mouvement Rodriguais* (and future Chief Commissioner). She also met with the Fisheries Department Head to discuss the lack of progress in finalising the marine reserves regulations.

Dr Edwards visited in September 2006 and undertook a range of fisheries analysis and database training activities requested by Shoals Rodrigues, FPS and UNDP Marine Protected Area project staff. Following the change in government, a meeting was also arranged with the new Chief Commissioner, Mr Johnson Roussety, to discuss the Darwin Initiative project and the delays in implementing the Marine Reserves. This was very productive with a promise of swift action by November. However, this was prevented when the RRA was dissolved with fresh elections held in December 2006. These were won by the *Mouvement Rodriguais* led by M. Roussety and true to his word, the marine reserve legislation was placed before the RRA at the earliest opportunity (February 2007). The reserves were officially gazetted on 9 April 2007.

Dr Edwards made a further training visit in September 2007 as well as assisting with the organisation of the workshop from 1-16 May in Rodrigues and presenting the Darwin work there. The main purpose of the training was to work with Shoals personnel on a detailed manual (Edwards, 2007) for the fisheries database so that the fisheries monitoring programme could continue without outside help.

In November 2007, Dr Gell made her final visit to complete a draft management plan (Gell et al., 2008) for the Rivière Banane Marine Reserve, which the RRA had scheduled as first for demarcation and implementation. Her visit involved further consultation with a very wide range of stakeholders, building on some five years of stakeholder meetings. The draft plan

was then circulated to all stakeholders (government departments, IOC, fishing communities, tourist operators, etc.) and comments collated during December. In January the plan was revised in line with feedback and has now been submitted to the Monitoring Committee for the Rivière Banane Marine Reserve, which has been set up by the RRA to take forward the management of the site.

Shoals Rodrigues Fisheries monitoring programme – large seine net fishery

A key effect of the marine reserves should be additional protection for fish species targeted by the lagoon seine net fishery, which now accounts for over 40% of fish catches. A better understanding of the population dynamics of these species is being built up using Shoals monitoring data on length-frequency distributions and gonads and FRTU data on catch and effort. The Darwin Initiative grant has provided 30-40% support to several Shoals staff to ensure this vital monitoring data continues to be collected.

The fishing season is between 1 March and 30 September each year. Assessments of the seine net catches were carried out with 4 fishing teams (Port Sud Est, Pointe Corail, Pointe l'Aigle and Baie du Nord) on 30 fishing days in 2005, 27 fishing days in 2006, and 26 fishing days in 2007 (Hardman et al., 2006a, 2006d, 2008c). The lengths of 44,697 fish belonging to about 100 different species with a total weight of approximately 14 tonnes were measured during the project. Representative samples of the main species caught were also taken back to the laboratory and subjected to more detailed measurements including weight, standard length (SL), fork length (FL), greatest body depth, and girth, and gonad analysis.

In order to manage the huge amount of data being collected and facilitate its analysis, it was necessary to develop a fisheries database. Dr Edwards developed a tailored relational database system using Microsoft Office Access and gave training to Shoals, FRTU, FPS and UNDP MPA project staff on database techniques. A manual for the database was also produced (Edwards, 2007). Data are now analysed using the database, which has greatly reduced the time needed for this (saving about a month of Shoals staff time each year) by automating most of the summarising of the data and the reporting process.

Initial analyses show that the modal size is well below the published length-at-maturity for 4 of the most commonly caught species and below the length of maximum yield for 6 common species, indicating that growth overfishing is occurring. Recruitment overfishing may also be occurring but the closed-season (October to February) and the large area of shallow (< 50 m deep) and largely unfished waters outside the lagoon may be preventing this. An analysis of mortality rates of the main species, undertaken by Jovani Raffin following training by Dr Edwards, showed estimated rates of fishing mortality to be several times natural mortality rates for a few species (e.g. Cordonnier *Siganus sutor*, Carangue *Caranx melampygus*), again suggesting gross overfishing. Catch per Unit Effort (kg of fish caught per fisher per hour the net is submerged) has declined significantly from 7.1 kg/hr in 2002 to 4.0 kg/hr in 2006 and the percentage of hauls where no fish were caught also increased from 5% in 2002 to 41% in 2006, further indications that the fishery is in decline. The majority of the most commonly caught species are herbivores and invertebrate feeders and have a small maximum size (<50cm) and a short lifespan (<10 years). There has also been a change in the catch composition, with previously undesirable species becoming more important, while large piscivores are rarely caught.

Annual reports on the status of the fishery are distributed to the Island Chief Executive, the Departmental Head for Fisheries, Head of FRTU, Environment Unit, Rodrigues Public Library, Director of the Mauritius Oceanography Institute, and the Albion Fisheries Research Centre Mauritius. The results of the research have been presented at the 5th Annual Meeting of Reef Conservation UK in London (2006), *A Regional Perspective on MPAs in the Western Indian Ocean* workshop in Rodrigues, and the *Fifth WIOMSA Scientific Symposium* in South Africa (2007). Two oral presentations on this work have also been accepted for the 11th International Coral Reef Symposium in the USA in 2008. A summary of the results was also given as a poster presentation at the 'Fete du Poisson' in Rodrigues in 2008 (reported in *L'Express Rodrigues*).

With five years of fisheries data now available, we have prepared two papers on the lagoon fishery and its status, which are being submitted to the journal *Fisheries Management and Ecology*. One is focused on describing the fishery, the catch composition, catch per unit effort and the variations from year to year. The other is focused on detailed analysis of the

length-frequency data to determine rates of fishing mortality for the main species caught, whether these appear sustainable, and also lengths at first capture and whether mesh size changes might be appropriate.

A key finding, in terms of management options for the large seine net lagoon fishery, is that although several of the main species appear severely overexploited, several others appear either optimally or underexploited. The rate of exploitation is largely related to the length/age at first capture, which varies dramatically between species depending on body shape. Deeper bodied species (e.g. surgeonfishes, rabbitfishes) tend to be overexploited, whereas the shallow bodied species (e.g. goatfishes, mullets) appear to be exploited at sustainable levels. Studies of the selection curves for the species indicate that the legal mesh size of 9 cm is being adhered to by the fisheries cooperatives sampled. It also shows that any increase in mesh size sufficient to benefit the deeper bodied species, would mean that the shallow bodied species would largely die of old age. Thus changes in mesh size are not a viable management option. This suggests that the route being taken by the RRA in developing additional reserve areas within the lagoon is probably the best option in terms of ensuring the sustainability of the fishery and preserving the marine biodiversity of the island. Our data also show that only about 9% of catches are obtained within the 4 proposed marine reserves.

Assessments of the line and basket-trap fisheries were started in September 2006 working in collaboration with FRTU enumerators. Surveys are carried out at approximately one fish landing station per week and so far have been undertaken on 29 fishing days at about 15 different landing stations. Fishers are asked questions about time spent fishing, where they were fishing, and techniques used, and the catch is measured.

Shoals Rodrigues Habitat monitoring programme

The first period of coral reef monitoring in 2005 concentrated on maintenance of the permanent transects, replacing lost markers and adding new markers in order to help with the re-location of transects and to increase the accuracy of repeated surveys (issues identified by Edwards, 2005). There are now 13 permanent monitoring sites, 6 within the marine reserves and 7 outside (see table below). Stations are split more or less equally between proposed marine reserve sites and non-reserve sites so that the impact of the reserves (once fully implemented) can be measured.

Inside Reserves			Outside Reserves		
Site	Reef Flat	Reef Slope	Site	Reef Flat	Reef Slope
Rivière Banane	*	*	Passe Armand	*	*
Grand Bassin	*	*	Passe l'Ancre	*	
Passe Demi		*	Trou Blanc	*	
Passe Cabri	*		Île aux Fous	*	*
			North Île aux Sables		*

During each year of the Darwin project, coral reef monitoring was carried out at the 13 sites twice yearly (March/April and October/November) using the Line Intercept Transect (benthos) and Belt Transect (fish and invertebrates) techniques. (It has been recommended that these surveys be carried out just once per year in the calmer season once the Darwin project ends.) In 2006, temperature loggers were also placed at 10 sites to record changes in sea surface temperature in order that any anomalous warming events causing coral bleaching and mortality can be recorded.

Following the training given by Dr Anderson in 2005 and 2006, 12 selected species of fish are now monitored at the reef flat and slope sites with counts and lengths of individuals being recorded. The selected species comprise both species that are targeted by the seine-net and other fisheries and ones that are not. This will allow the response of these species to implementation of the marine reserves to be monitored.

The surveys indicate that coral cover remains comparatively high at three of the reef slope sites (>45%), but is low on all reef flat sites (<30%). The fish community at all sites tended to be dominated by damselfish, whereas larger predatory fish such as emperors, snapper, trevally and grouper (i.e. favoured food fish) were rare or absent, suggesting that overfishing is occurring. Fish communities were also dominated by small under-sized individuals.

Surveys of lagoon habitats were initially carried out at 10 sites during May/June each year (this was reduced to 8 sites in 2006 following the recommendation of Dr Edwards to discontinue surveys of fine sediment areas). A timed-swim technique is used to survey three 500m transects at each of the sites. Surveys over 5 years suggest a decline in seagrass, a decline in numbers of fish (particularly large predatory fish), and in sites in the southern lagoon a decline in coral and increase in algae. In 2007, following the start up of a sea cucumber fishery in April 2006, numbers of holothurians declined dramatically.

This monitoring now provides a 5-year baseline against which the effects of the proposed reserves and the southern lagoon MPA can be judged. The data are also being used to help the UNDP MPA project to delimit zones within the proposed MPA.

An annual report has been produced each year summarising the results of a) the reef flat and reef slope surveys, and b) the lagoon surveys (see Appendix III). These are distributed to the appropriate government departments and agencies in Rodrigues and Mauritius. A summary of the results of this research was also presented at *National Ocean Science Forum* in Mauritius in 2007.

Shoals Rodrigues Education campaign

Stakeholder participation and education of both fishers and young Rodriguans is central to making the marine reserves understood, accepted and ultimately successful. The Shoals Education Team (supported 25% by Darwin) spearheaded this work.

The education and public awareness work of Shoals during the project has been multipronged with: 1) *Club Mer* (a weekly club for young Rodriguans who have an interest in conservation, the environment and the sea), 2) visits to primary and secondary schools, 3) production of the "Discovering the Ocean World" primary school pack, 4) visits by schools to the Pointe Monier *Marine Research, Training and Education Centre*, and 5) snorkelling and other shore-based events. In addition, there have been specific Darwin posters (see section 6. Project Outputs), fisher training and stakeholder consultation sessions focused around the establishment of the four marine reserves.

Club Mer rolls varied between 30 and 65 students during the project and typically involve about 20-30 Saturday sessions each year including PowerPoint presentations on topics such as 'Shore Safety', 'Waves, Tides and Currents', 'Fish Biology', 'Coral Reefs', 'Rocky Shores' and 'Pollution' as well as coral reef, seagrass and rocky shore field studies. Swimming sessions are also given to *Club Mer* members and the general public every Saturday, and Lagoon and Reef Snorkeller courses are held periodically. Environment Week generally involves a Coastal Clean-up at Pointe Monier, in collaboration with *Club Mer*, FRTU, FPS and the National Coastguard, and a 'Try Dive' session in the swimming pool. *Club Mer* continues to progress and this year, 113 students signed up for the new course in February 2008, with approximately 45 now attending on a regular basis.

In 2005, the Shoals education team visited 13 primary schools in Rodrigues, discussing topics such as 'Animals in the Environment', 'Water' and 'Mangroves'. School groups from both Rodrigues and Mauritius also regularly visit the Shoals Rodrigues Centre: (e.g. 70 students from Don Bosco Primary School visited in March 2005; 50 students from Lorette College, Curepipe in Mauritius visited in July 2005 and 2006; 10 young people from the National Youth Achievement Award were taken out snorkelling on the coral reef in November 2005; 70 students from École du Nord in Mauritius spent 2 weeks at the Shoals Rodrigues Centre in March 2006 participating in snorkelling sessions, zooplankton surveys, beach trails and swimming; 40 students from Roche Bon Dieu visited in February 2007).

In 2006 *Shoals Rodrigues* won the \$100,000 AGFUND International prize for pioneering development projects for their "Discovering the Ocean World" primary school pack. There were 37 nominated projects from 23 states. The education team is 25% funded through the Darwin Initiative. This prize is well-deserved international recognition of the education work of Shoals.

The education team also won the 2-year contract (worth £36,800) to undertake the Community Participation Campaign for the UNDP MPA project in the south of Rodrigues, which involves a sensitisation campaign working with 10 coastal villages in the south of Rodrigues.

Fisher education, training and consultation sessions (stakeholder meetings)

Dr Gell worked with the Shoals Education Team in early 2005 to advise on community consultation and stakeholder participation and provided a report to guide their work with fisher communities (Gell, 2005) and the development of a strategy for management of the reserves. This strategy has been developed during the project into a reserve management plan, which was finalised on schedule in 2008 and will be central to the reserves achieving their aims (Gell et al., 2008).

Fisher training

The aim of the fisher training sessions was to improve fisher practices by educating them about the marine environment, their potential impacts on it and how they might minimise adverse impacts. Fisher training sessions have been run primarily by the Shoals Education team. In 2005 there were 30 sessions at 4 fishing villages (Mourouk, Terre Rouge, Rivière Banane and Graviers), discussing topics such as coral reefs, octopus biology, fisheries management and shore safety. A new fisher training manual to complement the course was completed. During 2006, 20 fisher training sessions were held at 3 fishing villages (Roseaux, Grand Baie and Songes), and in 2007 there were 20 fisher training sessions at the villages of St François and Pointe Coton. These sessions have also established good relations with fishers in these villages, many of whom will be affected by the marine reserves.

Stakeholder consultation meetings

Stakeholder meetings with fishers started in 2002 (when fishers helped to delineate the marine reserve locations and boundaries) during the initial planning of the Darwin project and are central to the acceptance of the reserves by the local communities. Seven stakeholder meetings were held in 2006 at six fishing villages and with a group of tourist boat operators to discuss the implications of the marine reserves. In general, the stakeholders were all very supportive of the reserves and recognised the need for them – many reported a decline in fish/octopus catches in recent years. A number of concerns were however raised: fishers were concerned about how they would earn a living if the areas were closed, with many asking for compensation; most fishers would however be happy to do other jobs such as beach cleaning and re-forestation. There was also concern about illegal fishing, how the reserves would be enforced and how unregistered fishers would be regulated. These concerns were communicated to the RRA by Shoals Director, Eric Blais, through the Coordinating Committee on Fisheries and Marine Resources (Hardman et al., 2006e).

Further meetings were held with fishers at 7 fishing villages in 2007, talking to 150 fishers. The sessions discussed the progress of the marine reserves in Rodrigues and their implications for fishers. In particular, the sessions discussed alternative livelihood options, investigating what alternative jobs fishers would consider and what support they would require. The meetings highlighted the fact that all fishers are very concerned about potential loss of livelihood, but would be willing to give up fishing if offered an alternative. They suggested planting trees, cutting down invasive plant species, beach cleaning, off-lagoon fishing and working as rangers for the new marine reserves. Many fishers were interested in setting up their own businesses such as raising livestock or planting vegetables and a number showed an interest in aquaculture. They highlighted a number of problems and asked for financial help to start up new businesses as well as training and business advice (Hardman et al., 2007b).

Following demarcation of the Rivière Banane Marine Reserve, meetings were held at 9 fishing villages during January/February 2008 in order to facilitate local support for the reserves and discuss alternative livelihood options. Due to recent declines in catches, fishers were in general supportive of the reserves and most wanted the other 3 marine reserves to be demarcated as soon as possible, but initially only wanted sea cucumber fishing banned. All highlighted the problems of illegal fishing and the need for good enforcement of the reserves. All were concerned about their loss of livelihood if they were unable to fish in the reserve areas. Suggested alternative jobs included: raising livestock, cutting down invasive species (e.g. Pikon Loulou), cleaning beaches, off-lagoon fishing and working as rangers for the marine reserves; elderly fishers suggested a Voluntary Retirement Scheme. Some 164 fishers (51 women, 113 men) attended the sessions (Hardman et al., 2008b).

As a result of these meetings, two alternative livelihood initiatives have been developed at Rivière Banane. Two new Associations were formed by the fishers: *Association Pêcheurs de Rivière Banane* and *Ocean Tribe*. *Shoals Rodrigues* was successful in securing funding from the Global Environment Facility Small Grants Programme (GEF-SGP) for Rs 1,500,000 (£29,400) for each of the 2 projects. The *Association Pêcheurs de Rivière Banane* will develop a project to raise livestock in a sustainable and environmentally-friendly way and *Ocean Tribe* will buy a glass bottom boat and start a business taking tourists to visit the new marine reserve. *Shoals Rodrigues* is continuing to support the two Associations throughout the initial stages of the projects through providing advice, logistical support and training.

Dive training

Integral to building local capacity in marine conservation and research is developing a cadre of qualified local SCUBA divers. The Shoals Director, Eric Blais was the only local qualified instructor and was keen to develop local SCUBA-diving capacity as part of the Darwin project. In 2005, four students gained the PADI Open Water Qualification and started training for PADI Advanced Open Water, while one gained his PADI Advanced Open Water qualification. Also, five students (4 from *Mauritius Wildlife Foundation*) started PADI Open Water training and one started training for PADI DiveMaster.

In 2006, Jovani Raffin of Shoals gained his PADI Instructor and Emergency Response Instructor qualifications with *Dive Mauritius* (see below) and took over dive training activities at *Shoals Rodrigues*. Five students (including the 4 from *Mauritius Wildlife Foundation*) gained their PADI Open Water qualification, and one successfully completed his PADI DiveMaster training. Two more started their Open Water training.

In 2007, three students completed their Advanced Open Water training, five (including 4 FPS and 1 FRTU officer) gained the PADI Open Water qualification, and two completed their DiveMaster qualification. Also 3 divers from the Shoals Education team were upgraded to PADI Rescue Diver. Students have also received training in coral reef monitoring techniques using the 'Reef Check' survey methodology.

Shoals staff training

A recommendation of the mid-term review was for additional CPD within Shoals beyond that offered by the UK consultants' focused project training. The following training was achieved: Liliana Ally - Rhodes University/South African Development Community (SDAC) International certificate in Environmental Education - South Africa (funded by SADC). Jovani Raffin - PADI Instructor and PADI Emergency First Response Instructor qualifications - Mauritius (funded by British High Commission, Port Louis). Jovani Raffin and Sabrina Desiré - Unesco-IHE Institute for Water Education course in Integrated Coastal Zone Management - online (funded by IOC). Sydney Perrine - SocMon Training for Trainers course (socio-economic monitoring) - Seychelles (funded by CORDIO). Sydney Perrine - WIOMSA International training workshop on the use of databases for socio-economic data analysis - Kenya (funded by WIOMSA). Sabrina Desiré - WIOMSA course in Systematic Conservation Planning - South Africa (funded by WIOMSA). Almost all Shoals staff also benefited from the Darwin dive training and improved their PADI qualifications.

5. Project Impacts

Due to the almost two-year delay in gazetting the 4 marine reserves, it is too early to assess whether the outputs achieved are leading to accomplishment of the project purpose. There is unlikely to be any measurable effect on either habitat regeneration or fish stocks until at least two years after the full marine reserve network is implemented (i.e. 2011 at the earliest). The funding to proceed to the next stage with this is now in place but further funds will be required to implement the management plans for the Anse aux Anglais (English Bay), Grand Bassin and Passe Demie reserves. Until the reserve and MPA network is in place and the alternative livelihood schemes are becoming a reality, it is too early for the RRA to develop an integrated strategy for fisheries and lagoon management. This should develop as part of the next phase of the work.

The project has initiated a process which should ultimately lead to the project purpose being achieved. This process has attracted considerable outside funding (£161,790 so far, for the next phase) and thus now has momentum. Without this Darwin project, it is unlikely that

Rodrigues would now be establishing a system of protected areas under article 8 (despite the expressed wishes of the Chief Commissioner back in 2003). It is also quite likely that *Shoals Rodrigues*, which represents almost the only capacity within Rodrigues to meet obligations under the CBD with respect to the marine environment, would not have survived without the core funding from Darwin as there was a dearth of significant grants in 2005-2006.

The training has improved skills across the board at Shoals Rodrigues; this unfortunately has the danger that personnel may leave for better jobs. However, despite the relatively low salaries (which did not rise with inflation between 2005 and 2007) the team have largely stayed together. The valuable skills base has been recognised externally and thus, for example, the Education team who worked extensively with Dr Gell, have been awarded the contract (worth £36,800) to undertake the Community Participation Campaign for the UNDP MPA project. Overall the fact that *Shoals Rodrigues* and partners have managed to raise a total of some £161,790 to continue the implementation of the reserves is an indicator that their local capacity is recognised.

The collaboration has established close links between Newcastle University and Shoals Rodrigues which will continue on the socio-economic side through Dr Selina Stead. In addition, two joint papers have been drafted for Fisheries Management and Ecology and a third on the Octopus fishery is envisaged as soon as time permits. Dr Fiona Gell (Wildlife and Conservation Division, Isle of Man) is also likely to stay involved with the project as the reserve management plans are implemented. The project has made the RRA realise that fisheries cannot be managed by dictate, but must involve proper long-term consultation with fishers and other stakeholders plus measures of empowerment to allow fishers to develop their own alternative livelihoods (rather than government “work” schemes that are ultimately unsustainable).

Ultimately, the fishing communities should benefit from the project. The lagoon fisheries are in decline and unless alternative livelihood projects can be developed, these communities will become poorer. By bringing the whole issue of alternative livelihoods to the attention of the RRA via the Coordinating Committee on Fisheries and Marine Resources and highlighting it as critical to any solution to the lagoon overfishing, the Darwin project will hopefully have a beneficial social impact.

6. Project Outputs

Total actual outputs (Appendix II) were very close to those in the agreed schedule although the split of some items between years sometimes varied from the schedule. For example, although overall training exceeded the output schedule, it was concentrated in the first two years where needed, with relatively little being done in year 3.

28 rather than 34 divers received training. This was largely because Eric Blais (Shoals Director) had a period when he was unable to train.

All posters and reports were produced as per the agreed schedule (Appendix III).

It was decided to submit the two papers on the fisheries as a pair to the journal *Fisheries Management and Ecology*:

Hardman ER, Edwards AJ, Raffin JSJ (MS) The lagoonal seine-net fishery of Rodrigues Island, Indian Ocean. I. Species composition and trends in catch and effort from 1994-2006.

Edwards AJ, Hardman ER, Raffin JSJ (MS) The lagoonal seine-net fishery of Rodrigues Island, Indian Ocean. II. Using length-frequency data to assess stock status and management options.

Unfortunately, the process of integrating them as well as work arising from the workshop in 2007 has led to a delay in submission.

Workshop

The central year-3 output of an international workshop (*A Regional Perspective on MPAs in the Western Indian Ocean*) brought together 75 delegates from 12 countries. The workshop was opened by Rodrigues' Chief Commissioner. The meeting was widened in discussion WWF, the Indian Ocean Commission, and the Western Indian Ocean Marine Science

Association (WIOMSA) to include a two-day session to initiate the Western Indian Ocean Marine Ecoregion (WIOMER) MPA Managers' Forum, in addition to the three-day formal meeting. Darwin funds supported the participation of: Dr A. Edwards, Dr F. Gell, Mr A. Harris, Dr S. Mangi, Dr L. Rodwell and Ms S. Walmsley (UK), Ms J. Lichuge (Mozambique), Ms J. Church (Kenya), M. B. Cauvin (Réunion), Dr V. Hoon (India), and Ms J. Sauzier (Mauritius Marine Conservation Society), Ms J. Ah-King (Reef Conservation Mauritius) and Ms P. Bapoo-Dundoo (UNDP SGP Mauritius), as well as 16 Rodriguais.

Three outputs from the "Regional Perspective on MPAs in the Western Indian Ocean" workshop have been emailed to all participants and placed on the Darwin project website:

Anon (2007a) *A Regional Perspective on MPAs in the Western Indian Ocean. Escale Vacances Hotel, Rodrigues Island, Mauritius 9-14 May 2007. Summary of Presentations.* 35 pp.

Anon (2007b) *A Regional Perspective on MPAs in the Western Indian Ocean. Escale Vacances Hotel, Rodrigues Island, Mauritius. 9-14 May 2007. Sommaires des Présentations.* 24 pp.

Edwards AJ, Hardman ER, Hooper T (eds) (2007) *A Regional Perspective on MPAs in the Western Indian Ocean. Escale Vacances Hotel, Rodrigues Island, Mauritius 9-14 May 2007. Marine Protected Area Information Tables.* 29 pp.

WWF and the Indian Ocean Commission have found the *Marine Protected Area Information Tables* particularly useful and WWF intends to develop these further. However, we still remain in discussion with WIOMSA as to whether there are enough papers of sufficient calibre for a special issue of the WIOMSA journal or whether we will just put all papers submitted into a PDF Proceedings. Thus the output "production of workshop proceedings" is not as yet completed.

Dissemination of outputs

Different outputs have different target audiences. All annual reports are distributed to the Island Chief Executive, the Departmental Head for Fisheries, Head of FRTU, Environment Unit, Rodrigues Public Library, Director of the Mauritius Oceanography Institute, and the Albion Fisheries Research Centre Mauritius, as well as any other interested parties. The results of the research have been presented at the 5th Annual Meeting of Reef Conservation UK in London (2006), *A Regional Perspective on MPAs in the Western Indian Ocean* workshop in Rodrigues, the *National Ocean Science Forum* in Mauritius, and the *Fifth WIOMSA Scientific Symposium* in South Africa (2007); and as a poster presentation at the 'Fete du Poisson' in Rodrigues in 2008 (also reported in *L'Express Rodrigues*). Two oral presentations on the research have also been accepted for the 11th *International Coral Reef Symposium* in the USA in 2008. Dr Edwards and Dr Hardman have both obtained funding from outside sources to attend this conference.

Local dissemination to the general public has been done by Shoals staff. Year 1 publicity for the Darwin Initiative work included radio interviews by Eric Blais, Director of Shoals on local radio in 2005 and early 2006, a piece in the national *Le Mauricien* newspaper in 2005 based on a press release we made in Mauritius and a piece about the seine net fishery in the local newspaper *Le Vrai Rodriguais*.

In year 2 he had an interview on the Mauritius Broadcasting Corporation (MBC) morning news in mid-2006 which led to a 1 hour radio slot and phone-in on the programme "Rodrigues en Question" a week later. He then appeared on the same programme again later in the year in relation to the marine reserves. Eric Blais also wrote an article on the marine reserves for *Le Nouveau Rodriguais* newspaper and appeared on Radio 1 and MBC Radio. Shoals Science Team, Emily Hardman and Sabrina Desiré were interviewed for "Rodrigues en Question" in early 2007, discussing the problems with overexploitation of sea cucumbers in Rodrigues. The launch of the second Darwin-funded poster was shown on the MBC production "Reflets de Rodrigues" in March 2007.

In year 3 local publicity for the project included 2 newspapers articles, a radio interview and a TV appearance (on the MBC production 'Carnets de Rodrigues') following the MPA workshop in May. Dr Edwards also wrote an article in *Darwin News* on the workshop. An article about our work with the fisher community was also published by Reuters.

Educational posters

A specific output related to dissemination were three posters. These were planned as part of the marine education element of the Darwin project, one for each year of the project. Two were fully funded by Darwin with the final one relying on local funds. 200 copies of each poster were produced using local graphic artists. Each poster was a collaboration between the education team of Shoals who understand how to get a message across to the public, and the research team, which provided the technical data with input from Dr Edwards. Each poster was distributed to all primary and secondary schools, FRTU, FPS as well as the fishing communities, restaurants, hotels, etc. The first (2005) was in English and entitled "Reef Fish of Rodrigues", with drawings by a local artist of 23 common fish species and facts about each one.

The second poster (2006) was in Creole and French and entitled "Too Small to Die" ("Trop Tipiti Pou Mort" in Creole) and shows why fish shouldn't be caught before they reach maturity. This poster was officially launched at the Shoals Rodrigues Centre by the Deputy Chief Commissioner, Mr Gaetan Jabeemissar, in February 2007. The launch was attended by local fishers, personnel from the FPS, the National Coastguard as well as Shoals Rodrigues members. The ceremony was filmed by the Mauritius Broadcasting Corporation and shown on the TV programme "Reflets de Rodrigues".

The third (2007) was in French and entitled "Le Récif de Demain" and teaches about the value of coral reefs and the threats to local reefs and ways of minimising impacts.

7. Project Expenditure

By staying in “résidences” rather than hotels and obtaining discount airfares the costs of travel and subsistence for UK consultants were reduced and it was agreed with the Darwin Secretariat that money thus saved could be used by Shoals Rodrigues to replace minor equipment and consumables essential for their monitoring programmes and office operation. Thus about £4000 was vired from ‘Travel and subsistence’ to ‘Others’.

<i>Item</i>	<i>2004/05</i>	<i>2005/06</i>	<i>2006/07</i>	<i>2007/08</i>	<i>Total</i>	<i>Budget</i>
Rent, rates, heating, overheads etc						
Office costs (e.g. postage, telephone, stationery)						
Travel and subsistence						
Printing						
Conferences, seminars, etc						
Capital items/equipment						
Others						
Salaries (total) - breakdown below						
Shoals Rodrigues						
Dr Emily Hardman, Science Coordinator (40%)						
Sabrina Desiré, Field Centre Manager (35%)						
Jovani Raffin, Research Officer (30%)						
Sydney Perrine, Technical Training Asst (30%)						
Eric Blais, Director (40%)						
Natacha Felicité, Education Officer (25%)						
Liliana Meunier, Education Officer (25%)						
Runolph Raffaut, Education Assistant (25%)						
UK consultants						
Dr Alasdair Edwards - 11% time (5 visits) ¹						
Dr Fiona Gell (10% time) – (4 visits)						
Dr Charles Anderson (2 visits in 2005/06)						
Total expenditure						
Budget						

In addition, audit costs (unbudgeted) of £2820 were also allowed as part of the final claim.

¹ Includes 65% overhead to Newcastle University.

8. Project Operation and Partnerships

The principal local partner has been the local NGO, *Shoals Rodrigues*. The project has also involved the Fisheries Research and Training Unit (FRTU), Fisheries Protection Service (FPS) and latterly the National Coastguard. *Shoals Rodrigues* has a representative on the Rodrigues Regional Assembly's Coordinating Committee on Fisheries and Marine Resources which provides a direct line to the Chief Commissioner and department heads. All local partners and the then Chief Commissioner were involved in the development and planning of the project at the outset (i.e. prior to submission to the Darwin Initiative). FRTU has a key role in monitoring fisheries and FPS and National Coastguard in the enforcement of fishing and reserve regulations.

Collaboration between UK and the main Rodrigues partner, *Shoals Rodrigues* has been close and friendly throughout the project. The training of Shoals personnel has been the most successful element of the training carried out during the project and they are seen by the island government (RRA) as the principal repository of skilled capacity for advice on marine management and biodiversity conservation issues, as well as leaders in environmental education and developing public awareness of environmental concerns. As the RRA are aware, the latter is needed to underpin political support for conservation measures. A key legacy of the project will be the cadre of well-trained and highly motivated local people that comprise *Shoals Rodrigues*.

Initially promising collaboration with FRTU was later less successful when there was loss of personnel without replacement. The main point-of-contact (in charge of fisheries statistics) was promoted and no longer had time to collaborate or fill a major skills gap identified at the project start as a training need. Work pressures also meant that collaboration with enumerators at fish landing sites lacked supervision, so that joint-monitoring and cascading of skills via *Shoals Rodrigues* did not match expectations. However, various members of FRTU benefited from direct training by all the UK visiting scientists at various stages of the project.

Links with FPS focused on training of their officers in fish identification and snorkelling skills as well as sensitising them to conservation, overfishing and habitat destruction issues. National Coastguard and FPS officers have also been closely involved with developing the draft management plan for the Rivière Banane Marine Reserve in terms of enforcement issues.

The project established good links with staff of the large (US\$ 4,293,260) UNDP project to set up a Marine Protected Area (MPA) in the southern lagoon of Rodrigues. The RRA has approached *Shoals Rodrigues* to solicit their help on monitoring techniques, environmental education and community sensitisation work for this project, which has been suffering from the lack of local capacity. The UNDP team have attended presentations and training sessions given by Darwin Initiative visiting scientists. Use of *Shoals* staff to assist the UNDP project effectively involves cascading training carried out for the Darwin Initiative project into the UNDP project.

Shoals Rodrigues has had active collaborations on education projects with *Reef Conservation Mauritius* and *Blue Ventures (Madagascar)* and on education and training with the *Mauritius Wildlife Foundation* (e.g. environmental training of tour operators). It has also worked with the *SocMon* (socio-economic monitoring) project of CORDIO (Coral Reef Degradation in the Indian Ocean) East Africa with a pilot study of the Rivière Banane site, which will be important in the development of alternative livelihoods.

The marine reserves workshop in May 2007 involved close collaboration with WWF, the Indian Ocean Commission (IOC), the Western Indian Ocean Marine Science Association (WIOMSA), and the Marine Education Trust (UK). The workshop built many bridges regionally and led to the setting up of the Western Indian Ocean Marine Ecoregion (WIOMER) MPA Managers' Forum with *Shoals Rodrigues* as a partner in the network. These links continue.

9. Monitoring and Evaluation, Lesson learning

Due to the lateness of the gazetting of the marine reserves we are only really at a stage where we have established the baseline (scientific, social and economic) but must await implementation of the reserves and development of alternative livelihoods before the value of much of the project can be **demonstrated**.

The main problem encountered was the blocking of the marine reserves legislation by a single official who dissimulated support throughout. The history of this was covered in detail in an annex to the Second Half-Year Report in October 2006. It was only when he told what we knew to be lies in front of the new Chief Commissioner that we were alerted to the position and were we able to take counter measures and, with a change of government, rectify the situation. The net result was that rather than the 4 marine reserves being gazetted in 2005 in year 1, they were gazetted in year 3 of the project in April 2007. Gazetting was considered a crucial milestone to focus the RRA's attention on the initial strategy report produced by Dr Gell after her first visit, entitled *Development of a strategy for marine reserve management in Rodrigues using community consultation and stakeholder participation*. This set out the need for proper community consultation and stakeholder participation in the planning process and, above all, made clear the need for the development of alternative livelihoods for fishers who would be affected by any reserve closures. Despite presentations on the implications of this report, the Coordinating Committee on Fisheries and Marine Resources appeared to us not to understand what was required in terms of action to initiate serious consideration of the alternative livelihoods issue. However, it may have been that the official who blocked the gazetting understood only too well and hence sought to delay gazetting as long as possible.

The other main problem related to the lack of capacity/manpower at the Fisheries Research and Training Unit. After initial good and productive working relations, the then Head of the unit was moved to another job and our main point-of-contact was promoted to cover his job as well as the one he was already doing. Despite approaches to his superior (the official set on blocking the gazetting), who agreed to help free up time for collaboration, no useful collaboration could be achieved. Indeed, it became clear that he had also lost control of the enumerators who worked for him.

The main useful lessons are the need to be aware of the potentially limited capacity in government in small island states, the defensiveness and insecurity that this can breed if a project is seen as likely to make new demands on (often stressed) officials with which they may not be comfortable, and the ability of one person in a small administration to derail plans even when these have been approved at a higher level. Being aware of the sensitivity to non-Rodriguan interference, most approaches to government were through *Shoals Rodrigues* local staff, but it was clear that there was even defensiveness about the capacity built up within the local NGO.

10. Actions taken in response to annual report reviews (if applicable)

The main issue raised in the review of the first Annual Report was the lack of progress in gazetting the 4 marine reserves. The reviewer also raised concerns about collaboration with other NGOs in Mauritius and the region and post-Darwin funding.

The first issue was addressed at length in the Second Half-year Report (October 2006) where the history of the reserve proposals since 2003, with extracts of the Minutes of the *Coordinating Committee on Fisheries and Marine Resources* from 2004, were presented to show how one middle ranking official had obstructed the process. The response also showed the continual pressure being exerted by *Shoals Rodrigues* personnel on officials and their and project leader's discussions at Chief Commissioner level to rectify the problem. Eventually, a change of government and considerable pressure from the new Chief Commissioner, M. Johnson Roussety, resolved the issue. However, the result was that the marine reserves were not gazetted until April 2007, in the final year of the project, rather than in late 2005 as planned. This delay meant that the process of implementing the reserves was not as far advanced at the project end as planned.

With regard to the second issue, *Shoals Rodrigues* is the only environmental NGO based in Rodrigues; it is much called upon by the RRA on account of its unique marine research and

educational capacity. It has active collaborations on education projects with *Reef Conservation Mauritius* and *Blue Ventures (Madagascar)* and on education and training with the *Mauritius Wildlife Foundation*. It has also worked with the *SocMon* (socio-economic monitoring) project of CORDIO (Coral Reef Degradation in the Indian Ocean) East Africa with a pilot study of the Rivière Banane site, which will be important in the development of alternative livelihoods. (There is further information with regard to this concern of the reviewer in section 12.)

The Mid-term Review was constructive and helpful and it was a pity it was never officially communicated to us by the Darwin Secretariat with discussion of the funding implications of some of the suggested changes and confirmation that the revised logframe was acceptable to the Secretariat. In the event we were advised unofficially to use the revised logframe as the basis for subsequent work. We did this as far as possible and followed the recommendations.

11. Darwin Identity

The Darwin logo features on all reports (22) and posters (3) arising from the project and has featured prominently on powerpoint presentations about the project made to the RRA, to regional scientific and MPA meetings held in Durban, Mauritius and Rodrigues. It also featured on a presentation made at the Zoological Society of London to the 9th Annual Meeting of Reef Conservation UK in December 2006 and will be on two oral presentations that have been accepted for the 11th International Coral Reef Symposium in Florida in July 2008. A large Darwin logo also features prominently in the main teaching room at the Shoals Rodrigues Marine Research, Training and Education Centre at Pointe Monier. Darwin lapel pins and stickers were also awarded as part of *Club Mer* activities. The Chief Commissioner, other RRA Commissioners and Mrs Pamela Bapoo-Dundoo, National Coordinator of the UNDP-GEF Small Grants Programme (SGP) have all mentioned the key role of the Darwin Initiative at a range of environmental and educational opening ceremonies including our central showcase workshop “*A Regional Perspective on MPAs in the Western Indian Ocean*” where the logo featured prominently.

School children, fishers in all communities with which *Shoals Rodrigues* works, government officials in relevant departments, and those interested in the marine environment in Rodrigues who listen to the radio, watch MBC television or read local newspapers have all been exposed to the work of the Darwin Initiative project.

I think the Darwin Initiative is seen as an important driver of biodiversity conservation in Rodrigues but due to the highly collaborative nature of the work of *Shoals Rodrigues* (with co-funding from many other sources for parts of the project, e.g. from GEF-UNDP SGP), there may be confusion as to its precise role. However, I believe it is seen locally as strongly identified with the establishment of the 4 marine reserves and with the conservation of Rodrigues' marine biodiversity.

12. Leverage

During the four financial years of the project, considerable additional support (totalling £80,997) for the biodiversity work associated with the Darwin Initiative project was attracted by *Shoals Rodrigues* for co-funding a range of the project activities. Donors included Barclays Bank (£4675 – years 1-2), Chester Zoo (£9000 – years 1-3), British High Commission (£1590 – year 1), International Fund for Agricultural Development (£4500 – years 1-2), New England Biolabs Foundation (£4513 – years 1-2), Friends of Mauritius Wildlife (£500 – year 1), A Nou Diboute Ensam (£716 – year 2), Rogers & Co Ltd (£1920 – year 2), United Nations Development Programme (£17,628 – years 2-3), CORDIO (£2641 – year 3), Trust Fund (£714 – year 3), AGFUND (Arabian Gulf Fund for United Nations Development) (£32,600 – years 3-4).

In addition, by widening the scope of our Darwin workshop (“*A Regional Perspective on MPAs in the Western Indian Ocean*”) in discussion with WWF, the Indian Ocean Commission, and the Western Indian Ocean Marine Science Association (WIOMSA), we were able to use the Darwin funding (c. £12,500) to attract over twice as much again

(€40,000) from Fonds Français pour l'Environnement Mondial (FFEM), WWF, the European Union's Regional Programme for Coastal Zone Management of the West Indian Ocean Countries (ReCoMaP), WIOMSA, and the French Ministry for Foreign Affairs, to support the much larger meeting.

Funding of €51,844 (£41,000) for the demarcation of the Rivière Banane marine reserve was obtained from the Indian Ocean Commission/WWF Madagascar through their programme "Creation of a regional network of MPAs in the islands of the Indian Ocean Commission" (funded by FFEM). Shoals have also obtained a grant of €16,482 (£13,000) to develop alternative livelihoods at Rivière Banane (agricultural consultant to visit, training for fishers in ecotourism, and construction of a beach resource centre at Rivière Banane) also funded by FFEM.

As a result of the stakeholder sessions, two new Associations (NGOs) were formed by the fishers at Rivière Banane (*Association Pêcheurs de Rivière Banane* and *Ocean Tribe*). *Shoals Rodrigues* was successful in securing Global Environment Facility Small Grants Programme funding of Rs 1,500,000 (£29,400) for each of the two alternative livelihood projects. *Shoals Rodrigues* were also successful in their application to the Decentralised Cooperation Programme (DCP), run through the Government of Mauritius with funding from the EU, for Rs 4,142,840 (£82,590), to cover demarcation of the remaining 3 marine reserves, on-going monitoring surveys, and education and socio-economic surveys working with Dr Selina Stead, Newcastle University. Dr Stead, will continue the Newcastle link with *Shoals Rodrigues* and develop skills on the social sciences side, where the focus now needs to be in terms of assisting the RRA in making the marine reserves operational.

Furthermore, Shoals Rodrigues was recently awarded a grant of Rs 1,885,950 (£36,800) for the Community Participation Campaign (CPC) for education/awareness-raising work in 10 villages in the southern lagoon where the large MPA is being established.

13. Sustainability and Legacy

Key legacies are the four marine reserves which were gazetted in April 2007. The next task is to make these reserves functional; the *Rivière Banane Marine Reserve Management Plan* developed during the project, after lengthy consultations with stakeholders, provides a blueprint for this. As mentioned above, funding of €51,844 was obtained for the demarcation of the Rivière Banane marine reserve and €16,482 to develop alternative livelihoods there, and some additional funding (£78,500) has already been obtained to cover demarcation of the remaining 3 marine reserves, on-going monitoring surveys, and education and socio-economic surveys. This work involves Dr Selina Stead, Newcastle University and will thus continue the link with Newcastle.

The other major legacy is the continuing skills base inside *Shoals Rodrigues*, which is clearly needed by the RRA. As with any NGO, as staff develop skills they become more attractive to other employers. Also, continuing salaries are dependent of successful project applications and so there is always an element of uncertainty for the future. As long as trained staff can be retained the NGO itself is a legacy. Unfortunately, direct support from the RRA is not an option due to the political set-up, which means that acceptance of such would be seen as identification with the political party in power and officialdom (thus alienating about half the population).

We had hoped to apply for a post-project funding to assist in the implementation of the reserves and research into alternative livelihood options, however, this was not possible due to the funding hiatus for 2008. This would certainly have helped with the legacy as most of the project related funding which Shoals has obtained from FFEM, DCP etc. to continue the work does not properly support central office costs and staff salaries.

14. Value for money

The c. £155,000 Darwin grant has allowed the primary environmental NGO in Rodrigues to survive, develop and prosper for 3 years and attract c. £81,000 in co-funding for project-related activities. In addition, it has allowed the NGO to become well-established in the regional marine science and management community, through the hosting of the regional MPA workshop in 2007. This is important now that Rodrigues is a semi-autonomous region within Mauritius and needs its own voice heard at such venues. The workshop itself attracted €40,000 of outside funding from international and regional bodies and Shoals obtained £41,000 to demarcate the Rivière Banane reserve and recently £78,500 to demarcate the three remaining reserves.

Meanwhile the US\$ 4,293,260 UNDP funded project to set up a Marine Protected Area (MPA) in the southern lagoon of Rodrigues, which also started in 2005, has not made as much progress and is keen to use the skills developed at *Shoals Rodrigues* for its Community Participation Campaign. I think that this both highlights the value for money of the Darwin project and the value of the skills base at Shoals.

15. Appendix I: Project Contribution to Articles under the Convention on Biological Diversity (CBD)

Project Contribution to Articles under the Convention on Biological Diversity		
Article No./Title	Project %	Article Description
6. General Measures for Conservation & Sustainable Use	5	Develop national strategies that integrate conservation and sustainable use.
7. Identification and Monitoring	20	Identify and monitor components of biological diversity, particularly those requiring urgent conservation; identify processes and activities that have adverse effects; maintain and organise relevant data.
8. In-situ Conservation	25	Establish systems of protected areas with guidelines for selection and management; regulate biological resources, promote protection of habitats; manage areas adjacent to protected areas; restore degraded ecosystems and recovery of threatened species; control risks associated with organisms modified by biotechnology; control spread of alien species; ensure compatibility between sustainable use of resources and their conservation; protect traditional lifestyles and knowledge on biological resources.
9. Ex-situ Conservation	0	Adopt ex-situ measures to conserve and research components of biological diversity, preferably in country of origin; facilitate recovery of threatened species; regulate and manage collection of biological resources.
10. Sustainable Use of Components of Biological Diversity	15	Integrate conservation and sustainable use in national decisions; protect sustainable customary uses; support local populations to implement remedial actions; encourage co-operation between governments and the private sector.
11. Incentive Measures	5	Establish economically and socially sound incentives to conserve and promote sustainable use of biological diversity.
12. Research and Training	10	Establish programmes for scientific and technical education in identification, conservation and sustainable use of biodiversity components; promote research contributing to the conservation and sustainable use of biological diversity, particularly in developing countries (in accordance with SBSTTA recommendations).
13. Public Education and Awareness	20	Promote understanding of the importance of measures to conserve biological diversity and propagate these measures through the media; cooperate with other states and organisations in developing awareness programmes.
14. Impact Assessment and Minimizing Adverse Impacts	0	Introduce EIAs of appropriate projects and allow public participation; take into account environmental consequences of policies; exchange information on impacts beyond State boundaries and work to reduce hazards; promote emergency responses to hazards; examine mechanisms for re-dress of international damage.

15. Access to Genetic Resources	0	Whilst governments control access to their genetic resources they should also facilitate access of environmentally sound uses on mutually agreed terms; scientific research based on a country's genetic resources should ensure sharing in a fair and equitable way of results and benefits.
16. Access to and Transfer of Technology	0	Countries shall ensure access to technologies relevant to conservation and sustainable use of biodiversity under fair and most favourable terms to the source countries (subject to patents and intellectual property rights) and ensure the private sector facilitates such assess and joint development of technologies.
17. Exchange of Information	0	Countries shall facilitate information exchange and repatriation including technical scientific and socio-economic research, information on training and surveying programmes and local knowledge
19. Bio-safety Protocol	0	Countries shall take legislative, administrative or policy measures to provide for the effective participation in biotechnological research activities and to ensure all practicable measures to promote and advance priority access on a fair and equitable basis, especially where they provide the genetic resources for such research.
Total %	100%	

16. Appendix II Outputs

Code	Total to date	Detail
Training Outputs		
3	28	Divers trained to PADI Open Water / Advanced Open Water / Rescue Diver and Divemaster qualifications (all Mauritian)
6a	42	Number of people receiving other forms of education/ training (18 Mauritians/2 UK – yr 1; 15 Mauritians/1 UK – yr 2; 5 Mauritians/1 UK – yr 3). [N.B.UK nationals were working full-time in Rodrigues.]
6b	8	Number of training weeks not leading to formal qualification
7	3	Number of training materials (posters) produced for use by host country
Research Outputs		
8	19	Number of weeks spent by UK project staff on project work in host country
9	1	<i>Rivière Banane Marine Reserve Management Plan</i>
11a	2 (submitted)	Number of papers published or accepted for publication in peer reviewed journals
11b	(1)	Abstract of paper given at 5 th WIOMSA Scientific Symposium is available on www.wiomsa.org
12a	1	Large seine-net fisheries database (with Manual)
Dissemination Outputs		
14a	1	A five-day workshop entitled <i>A Regional Perspective on MPAs in the Western Indian Ocean</i> was organised in Rodrigues in May 2007. This attracted 75 participants from 12 countries.
14b	5 (2 more due in 2008)	Darwin project work was presented at: 5 th Annual Meeting of Reef Conservation UK in London (2006); <i>A Regional Perspective on MPAs in the Western Indian Ocean</i> workshop in Rodrigues, <i>National Ocean Science Forum</i> in Mauritius, <i>Fifth WIOMSA Scientific Symposium</i> in South Africa (2007); <i>Fête du Poisson</i> in Rodrigues (2008). (Two oral presentations have also been accepted for the 11 th International Coral Reef Symposium in the USA in 2008.)
15a	2	<i>Le Mauricien</i> , Reuters
15b	5	<i>Le Vrai Rodriguais</i> , <i>L'Express Rodrigues</i> , <i>Le Nouveau Rodriguais</i>
15c	1	<i>Darwin News</i>
16a	6	<i>Shoals Rodrigues Newsletter</i> (latest issues only available on the internet)
16b	90	Estimated circulation of each newsletter in the host country (50 Rodrigues, 40 Mauritius)
16c	45	Estimated circulation of each newsletter in the UK
18c	2	<i>MBC Carnets de Rodrigues</i> , <i>MBC Reflets de Rodrigues</i>
19a	3	MBC morning news, etc.
19c	8	For example, appearances on <i>Rodrigues en Question</i> , etc.
Physical Outputs		
20	£5000	Estimated value of laboratory, monitoring and office equipment handed over to host country (includes loss on depreciation)
22	13	Number of permanent field plots established
23	£150,500	About £81,000 was raised by Shoals in co-funding for various aspects of the project, we attracted an extra € 40,000 (then worth about £28,500) of outside funding for the MPA workshop in 2007 and € 51,844 (£41,000) to demarcate the Rivière Banane Marine Reserve. In addition, funds totalling £161,790 have been obtained to follow up the marine reserve development.

17. Appendix III: Publications

Mark (*) all publications and other material that you have included with this report

Publications below can be publicly accessed from the website:

www.ncl.ac.uk/tcmweb/tmr/aje_darwin_rodrigues.html

Type	Detail	Publishers
Report	Anderson, RC (2005) <i>Impacts of Marine Reserves in Rodrigues: Report of a training visit to Shoals Rodrigues, September 2005</i> . 26 pp.	Atoll Wildlife, Newmarket.
Report	Anderson RC (2006) <i>Impacts of Marine Reserves in Rodrigues: Report of a training visit to Shoals Rodrigues, March 2006</i> . 21 pp.	Manta Marine Pvt Ltd: Malé.
Report	Edwards AJ (2005) <i>Review of the status of fisheries and habitat monitoring programmes at Rodrigues with recommendations for development following establishment of marine reserves</i> . 34 pp.	Newcastle University: Newcastle upon Tyne.
Report	Gell FR (2005) <i>Development of a strategy for marine reserve management in Rodrigues using community consultation and stakeholder participation</i> . 28 pp.	Port Erin
Report	Hardman ER, Blais FEI, Desiré MS, Raffin JSJ, Perrine S, Raffaut R, Chinien-Chetty M (2006a) <i>Annual report on the status of the artisanal seine net fishery of Rodrigues 2005</i> . v + 56 pp.	Shoals Rodrigues: Pointe Monier.
Report	Hardman ER, Blais FEI, Desiré MS, Raffin JSJ, Perrine S, Raffaut R, Chinien-Chetty M (2006b) <i>Annual report of benthos, reef fish and invertebrate surveys for reef slope and reef flat areas in Rodrigues 2005</i> . 43 pp.	Shoals Rodrigues: Pointe Monier.
Report	Hardman ER, Blais FEI, Raffin JSJ, Perrine S, Raffaut R, Chinien-Chetty M (2006c) <i>Annual report of benthos, reef fish and invertebrate surveys for lagoon areas in Rodrigues 2005</i> . 25 pp.	Shoals Rodrigues: Point Monier.
Poster	<i>Reef Fishes of Rodrigues</i> (Prepared by the Shoals Education team in consultation with Dr Edwards and Shoals Research team)	Shoals Rodrigues: Point Monier.
Report	Hardman ER, Blais FEI, Desiré MS, Raffin JSJ, Perrine S, Chinien-Chetty RM, Meunier S (2006d) <i>Annual report on the status of the artisanal seine net fishery of Rodrigues 2006</i> . 29 pp. + appendices.	Shoals Rodrigues: Pointe Monier.
Report	Hardman ER, Gell FR, Blais FEI, Desiré MS, Raffin JSJ, Perrine S, Chinien-Chetty, M (2006e) <i>Marine Reserves for sustainable fisheries management in Rodrigues</i> . iii + 13 pp.	Shoals Rodrigues: Pointe Monier.
Report	Hardman ER, Blais FEI, Raffin JSJ, Perrine S, Chinien-Chetty M (2006f) <i>Annual report of benthos, reef fish and invertebrate surveys for lagoon areas in Rodrigues 2006</i> . 19 pp.	Shoals Rodrigues: Point Monier.
Report	Gell FR (2006) <i>Development of a strategy for marine reserve management in Rodrigues using community consultation and stakeholder participation</i> . Report on a second visit to Rodrigues, 27 March to 16 April 2006. iv + 25 pp.	Port Erin
Report	Hardman ER, Blais FEI, Desiré MS, Raffin JSJ, Perrine S, Raffaut R, Chinien-Chetty M, Towill J (2007a) <i>Annual report of benthos, reef fish and invertebrate surveys for reef slope and reef flat areas in Rodrigues 2006</i> . 51 pp.	Shoals Rodrigues: Pointe Monier.
Poster	<i>Trop tipiti pou mort</i> (Poster on dangers of overfishing, in Creole and French – prepared by the Shoals Education team in consultation with Dr Edwards and Shoals Research team)	Shoals Rodrigues: Point Monier.
Report	Hardman ER, Blais FEI, Desiré MS, Raffin JSJ, Perrine S, Gell FR (2007b) <i>Marine Reserves for Sustainable Fisheries Management in Rodrigues. Alternative Livelihood Options: 1</i> . ii + 6pp. +	Shoals Rodrigues: Point Monier.

	appendices.	
Report	Anon (2007a) <i>A Regional Perspective on MPAs in the Western Indian Ocean. Escale Vacances Hotel, Rodrigues Island, Mauritius 9-14 May 2007. Summary of Presentations.</i> 35 pp.	Shoals Rodrigues: Point Monier.
Report	Anon (2007b) <i>A Regional Perspective on MPAs in the Western Indian Ocean. Escale Vacances Hotel, Rodrigues Island, Mauritius. 9-14 May 2007. Sommaires des Présentations.</i> 24 pp.	Shoals Rodrigues: Point Monier.
Manual	Edwards AJ (2007) <i>Manual for the Fishing Database developed for Shoals Rodrigues for monitoring of the large seine-net lagoon fishery.</i> 10 pp.	Newcastle University: Newcastle upon Tyne.
Report	Edwards AJ, Hardman ER, Hooper T (eds) (2007) <i>A Regional Perspective on MPAs in the Western Indian Ocean. Escale Vacances Hotel, Rodrigues Island, Mauritius 9-14 May 2007. Marine Protected Area Information Tables.</i> 29 pp.	Newcastle University & Shoals Rodrigues.
Article	Edwards AJ (2007) Marine reserves declared in Rodrigues and local NGO Shoals Rodrigues wins two awards.	Darwin News, Issue 9: 4-5.
Poster	<i>Le Récif de demain</i> (Poster on value of and threats to local reefs and ways of minimising impacts, in French – prepared by the Shoals Education team in consultation with Dr Edwards and Shoals Research team)	Shoals Rodrigues: Point Monier.
Report	Hardman ER, Blais FEI, Desiré MS, Raffin JSJ, Perrine S (2008a) <i>Annual report of benthos, reef fish and invertebrate surveys for lagoon areas in Rodrigues 2007.</i> iv + 14 pp. + appendices.	Shoals Rodrigues: Point Monier.
Report	Hardman ER, Desiré MS, Raffin JSJ, Perrine S, Gell FR (2008b) <i>Marine Reserves for Sustainable Fisheries Management in Rodrigues. Alternative Livelihood Options: 2.</i> ii + 7 pp.	Shoals Rodrigues: Point Monier.
Report	Hardman ER, Blais FEI, Desiré MS, Raffin JSJ, Perrine S, Meunier S (2008c) <i>Annual report on the status of the artisanal seine net fishery of Rodrigues 2007.</i> v + 24 pp. + appendices.	Shoals Rodrigues: Pointe Monier.
Report	Hardman ER, Blais FEI, Desiré MS, Raffin JSJ, Perrine S, Taylor J (2008d) <i>Annual report of benthos, reef fish and invertebrate surveys for reef slope and reef flat areas in Rodrigues 2007.</i> iv + 40 pp.	Shoals Rodrigues: Pointe Monier.
Report	Gell FR et al. (2008) <i>Rivière Banane Marine Reserve Management Plan.</i> 24 pp.	Port Erin: Isle of Man; Shoals Rodrigues
Journal*	Hardman ER, Edwards AJ, Raffin JSJ (MS) The seine-net fishery of Rodrigues Island, Indian Ocean. I. Species composition and trends in catch and effort from 1994-2006.	<i>Fisheries Management and Ecology</i>
Journal*	Edwards AJ, Hardman ER, Raffin JSJ (MS) The seine-net fishery of Rodrigues Island, Indian Ocean. II. Using length-frequency data to assess stock status and management options.	<i>Fisheries Management and Ecology</i>

18. Appendix IV: Darwin Contacts

Project Title	Developing reserves for biodiversity conservation and sustainable fisheries in Rodrigues
Ref. No.	162/13/027
UK Leader Details	
Name	Dr Alasdair Edwards
Role within Darwin Project	Leader
Address	School of Biology, Ridley Building, Newcastle University, Newcastle upon Tyne NE1 7RU
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Fax	
Email	
Other UK Contact (if relevant)	
Name	Dr Fiona Gell
Role within Darwin Project	MPA adviser
Address	Wildlife and Conservation Division, Department of Agriculture, Fisheries and Forestry, Knockaloe Farm, Peel, Isle of Man IM5 3AJ
Phone	
Fax	
Email	
Partner 1	
Name	Dr Emily Hardman
Organisation	Shoals Rodrigues
Role within Darwin Project	Coordinator of NGO partner's research and education activities linked to the Darwin Initiative project
Address	Marine Research, Training & Education Centre, Pointe Monier, Rodrigues, Mauritius
Fax	
Email	
Partner 2 (if relevant)	
Name	
Organisation	
Role within Darwin Project	
Address	
Fax	
Email	

Appendix V.

Revised Logical Framework suggested by Mid-Term Review.

(We still await official communication of the findings of the mid-term review and an indication of whether we can act on the revised logframe. Informally we have been advised to follow the revised logical framework although the budgetary implications have never been discussed.)

Narrative	Measurable Indicators	Means of Verification	Assumptions
<p>Purpose</p> <p>A sustained improvement in the protection of Rodrigues' marine biodiversity and its fisheries management</p>	<p>Integrated strategy for fisheries and lagoon management in place by end of project</p> <p>Measurable habitat regeneration and fish stocks recovery within 2 years of reserve implementation</p>	<p>NBSAP implementation plans and progress reports</p> <p>Minutes of relevant RRA meetings</p> <p>RRA Fisheries Strategy</p> <p>Fish and lagoon monitoring reports</p>	<p>Diversified livelihoods for fishers are adopted</p> <p>Regulatory instruments for biodiversity protection are in place</p> <p>RRA remains committed to an integrated approach for lagoon management</p>
<p>Output 1:</p> <p>Marine protected area network launched.</p>	<p>Network of reserves formally proclaimed by 03/07</p> <p>Reserve at Rivier Banane demarcated with buoys by 01/08</p> <p>Management strategy for reserve network drafted by RRA with Shoals/DI input by 07/07 and implemented in collaboration with stakeholders by EoP</p>	<p>Publication in official newspaper/gazette</p> <p>Demarcation on maps & fixed point photos</p> <p>Management Plan</p> <p>Minutes of relevant RRA meetings</p>	<p>RRA and fishers to respect the protected area network</p> <p>Sufficient capacity is provided by RRA to management agencies</p> <p>Law enforcement improves</p>
<p>Output 2:</p> <p>The understanding of Rodrigues' marine environment improved through research and monitoring</p>	<p>Collaboration with MPA project established by 03/07 and continues to EoP.</p> <p>At least 15 individuals from 2 partner agencies trained in marine monitoring activities by 09/06 and joint monitoring activities undertaken by end '07.</p> <p>Outcomes of research monitoring broadcast through bi-annual Shoals newsletters and 4 radio broadcasts and newspaper articles per year.</p>	<p>Minutes of joint meetings</p> <p>Study and monitoring reports with evidence of co-authorship between two partner agencies</p> <p>Training reports</p> <p>Media Transcripts</p>	<p>Staff turnover in partner agencies is minimal</p> <p>Stakeholders are willing and able to learn from the DI Project</p> <p>Funding for parallel initiatives in the island is forthcoming</p>

<p>Output 3: Fishing practices amongst local fishers improved</p>	<p>International workshop in best practices held by 06/07 Information drawn from the regular monitoring and research drawn into best practices and provided to RRA by 09/07 and leads to better decision-making and effective implementation of the management plan by EoP. Dissemination of practices and education in their use to at least 4 fisher communities by end '05 and a further 6 by end '07. At least 3 different posters illustrating best practices printed, one per year.</p>	<p>Research papers Fisher meeting minutes or reports Pictures of improved practices Results from regular monitoring Reports from Club Mer programme Copies of posters and newsletters</p>	<p>Regional representatives fully participate in the workshop. Fisher communities are interested in attending education and awareness sessions and willing to put into practice what they learn. Incentives for improved fishing, through identification and implementation of alternative livelihoods for fisher communities, are provided. Government bodies incorporate the improved practices into their regulatory mechanisms</p>
<p>Output 4: Capacity for marine research, monitoring and education built in local institutions</p>	<p>MOU between Shoals and RRA agreed by 05/07. 5 year development plan for Shoals in place by 10/07. Shoals maintains contacts within 2 regional networks and establishes 1 further regional relationship by EoP. 75% of Shoals staff provided with at least one formal training programme in their respective fields by EoP.</p>	<p>Shoals Newsletters Shoals Development Plan Media articles and radio talks Shoals-RRA MoU Minutes of RRA Committee meetings where Shoals is represented</p>	<p>RRA willing to engage in MoU with Shoals. FRTU and Shoals are able to establish their long-term role and relationship. Core funding for Shoals continues ex DI. Shoals is able to recruit and retain qualified people.</p>

Appendix VI.

Project's original logframe

This was revised following the mid-term review. We still await formal notification of the findings of the review but were advised by ECTF that in the meantime we should adopt the suggested revised framework (above).

Project summary	Measurable indicators	Means of verification	Important assumptions
<p>Goal:</p> <p><i>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</i></p> <ul style="list-style-type: none"> <i>the conservation of biological diversity,</i> <i>the sustainable use of its components, and</i> <i>the fair and equitable sharing of the benefits arising out of the utilisation of genetic resources</i> 			
<p>Purpose</p> <p><i>Marine biodiversity in Rodrigues protected and sustainability of fisheries improved through the establishment of marine reserves, increased capacity in marine research skills, and raising environmental awareness across the community.</i></p>	<p><i>Development of management strategy for marine reserves and setting up of marine reserves in yr 1 with full stakeholder support</i></p> <p><i>Monitoring programme for reef and lagoon habitats and fisheries set up in yr 1 and fully collaborative between NGO and Government by yr3</i></p> <p><i>Evidence of effectiveness of management strategy, habitat regeneration and improved fish stocks by yr 3.</i></p> <p><i>Education campaigns begin in yr 1 and reach a wide cross-section of the community by yr 3.</i></p>	<p><i>Minutes of meetings of the Co-ordinating committee on Fisheries and Marine Resources and reports from village meetings.</i></p> <p><i>Attendance at training courses and subsequent participation in field surveys.</i></p> <p><i>Reports on field surveys by partner institutions.</i></p> <p><i>Statistics on infringement of marine reserve regulations.</i></p> <p><i>Statistics on number of individuals and types of community groups reached by education campaigns.</i></p>	<p><i>Rodrigues regional Assembly and stakeholder groups remain supportive of the initiative.</i></p> <p><i>No other developments that could impact on the reserves (through increased pollution levels for example) are permitted.</i></p>
<p>Outputs</p> <p><i>Management strategy developed and approved amongst stakeholder groups.</i></p>	<p><i>Stakeholder groups are well represented at meetings of the Co-ordinating Committee.</i></p> <p><i>Meetings are held in fishing communities to disseminate results of Committee meetings.</i></p>	<p><i>Minutes of Co-ordinating Committee meetings.</i></p> <p><i>Reports of and attendance records from, meetings at village level.</i></p>	<p><i>Stakeholder groups are motivated to participate in the process.</i></p>
<p><i>Monitoring programmes for biodiversity in lagoon and reef habitats and status of fisheries established and carried out by 2 partner agencies.</i></p>	<p><i>At least 15 people in total from the 2 partner agencies (NGO and Government) trained in monitoring and data processing techniques, and associated diver training given, with full participation by members of both agencies in monitoring activities ensured by yr 3.</i></p>	<p><i>Training attendance records.</i></p> <p><i>Databases of species, habitat and fishery data.</i></p> <p><i>Field survey reports, with evidence of co-authorship between the two partner agencies.</i></p>	<p><i>Personnel from partner agencies available to attend training and motivated to participate in monitoring activities.</i></p>

<p><i>Education campaigns for fishers, children, young people and the wider community.</i></p>	<p><i>At least 10 fishing villages, 8 primary schools, 2 secondary schools and 250 independent young people reached by yr3.</i></p> <p><i>200 copies of each of 3 different posters circulated, with one produced each year.</i></p> <p><i>At least four radio broadcasts and newspaper articles produced each year.</i></p>	<p><i>Attendance records at education sessions.</i></p> <p><i>Progress reports from partner agencies.</i></p> <p><i>Copies of posters and newsletters and recordings of radio broadcasts.</i></p>	<p><i>The community is sufficiently interested in the protection of their marine environment to attend education sessions.</i></p> <p><i>The local media is willing to carry newspaper articles and broadcast radio programmes written by project partners.</i></p>
<p><i>Lessons learned and best practice guidelines</i></p>	<p><i>Workshop on marine reserves organised attended by representatives from Rodrigues, Mauritius, Comores, Madagascar, Seychelles and Reunion, and 200 copies of the proceedings published and circulated in yr 3.</i></p> <p><i>Report on project successes and failures produced in yr 3 including quantification of all participation, difficulties encountered, and qualitative and quantitative evidence to support progress towards overall project purpose.</i></p>	<p><i>Workshop proceedings.</i></p> <p><i>Project report, together with copies of all reports and publications sent to Darwin Initiative, Government, stakeholder groups and other interested parties.</i></p>	<p><i>Personnel from Governments and NGOs in other island states attend, and fully participate in, workshop.</i></p>
<p>Activities</p> <p><i>Discussion and training</i></p>	<p>Activity Milestones (Summary of Project Implementation Timetable)</p> <p><i>Yr 1: Project planning to identify participants and priorities, discuss monitoring and education programmes, define project schedule and give input into reserves management strategy (2 weeks Mar 05); Evaluation of existing fisheries research programmes and data, training in data processing techniques and training in additional practical techniques (2 weeks Mar 05). Training in habitat and population survey techniques (2 weeks Mar 05); Diver training (during Feb and July/Aug 05);</i></p> <p><i>Yr 2: Follow up training in fishing and habitat survey techniques and data processing x 2; Discussion meeting on progress and any problems with management strategy for marine reserves x 1.</i></p> <p><i>Yr 3: Review meetings on progress of project components and degree of success of reserve management x 2.</i></p>		
<p><i>Habitat and Fisheries monitoring</i></p>	<p><i>Yr 1: Sites and protocols for habitat and population monitoring programmes agreed Mar 05, monitoring commences Mar 05; Fisheries monitoring methods agreed Mar 05, monitoring commences Mar 05.</i></p> <p><i>Yrs 2 & 3: Continuation of habitat and population monitoring in Feb/Mar/Apr and Aug/Sept/Oct each year and fisheries monitoring throughout the year. Reports produced at the end of each calendar year; 2 peer reviewed publications by Yr 3.</i></p>		

<i>Education campaign</i>	<p><i>Yr 1: Subject areas and outreach strategy for different target groups agreed Feb 05, draft, campaigns commence Feb 05; draft materials prepared by end Jun 05; First poster circulated Sep 05;</i></p> <p><i>Yrs 2 & 3: One poster, 2 radio broadcasts and 2 newspaper articles per year</i></p>
<i>Best practice guidelines disseminated</i>	<p><i>Yr 3: Workshop on marine reserves for delegates from western Indian Ocean island states, production of workshop proceedings within six months</i></p>