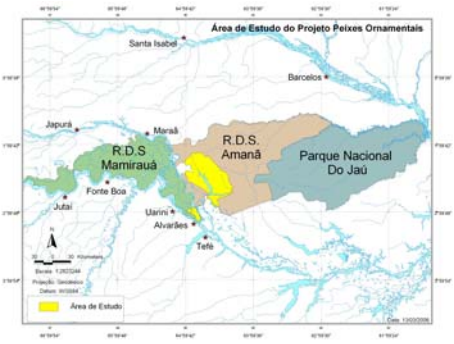
Darwin Initiative Annual Report

Darwin Project Information

Project Ref Number	14-060
Project Title	Sustainable Management of Ornamental Fish Species in Mamirauá, Brazil
Country(ies)	Brazil
UK Contract Holder Institution	Zoological Society of London (ZSL)
UK Partner Institution(s)	
Host country Partner Institution(s)	Sociadad Civil Mamirauá (SCM)
Darwin Grant Value	£218,000
Start/End dates of Project	June 2005 - June 2008
Reporting period (1 Apr 2006 to 31 Mar 2007) and annual report number (1,2,3..)	1 Apr 2006 to 31 Mar 2007 Annual Report No. 2
Project Leader Name	Alison Shaw
Project website	
Author(s), date	Alison Shaw, 17 April 2007

1. Project Background

To protect the biodiversity of fish within an area of Brazilian Amazon, by developing a sustainable freshwater ornamental fish trade. This is to be achieved by developing a pilot project in the Mamirauá Sustainable Development Reserve (MSDR) and the Amanã Sustainable Development Reserve (ASDR). The introduction of such a trade will result in direct economic benefits to the rural community, and the monetary value, along with the establishment of a sustainable system, will encourage the long-term protection of fish diversity within the reserve. The pilot scheme will establish trade guidelines that can be adopted for a certification system within this, and other, Amazonian regions.



2. Project Partnerships

The project partnership between ZSL and SCM continues. Both organisations are looking at new ways to collaborate with each other in addition to the Darwin Initiative, such as through establishing projects looking at the health of the riverine mammals. A project planning workshop was held in Manaus in September with all the team members attending. This built team camaraderie, rejuvenated motivation and brought everyone up to speed with all the different components of the project. There are still language barriers, but newly recruited team members are more experienced in communicating in English. The language skills of the rest of the team are also developing in both English and Portuguese.

This year the project has developed relationships with other projects trying to achieve a similar purpose in the Amazonian Region. This includes the WCS Ornamental Fish Project in Bolivia – (the project manager attended our project workshops and field sites); Colombian Instituto Amazónica de Investigaciones Científicas, where our Trade Advisor lectured on the industry; Fundación Omacha and Conservation International *Project Growth and consolidation of protected areas and generation of sustainable economic alternatives focused on ornamental fishing and ecotourism in the Tuparro Biosphere Reserve through a participative scheme* where our Trade Advisor provided technical advice. Relationships and collaboration continue with Project Piaba and both attended the Barcelos Ornamental Fish Festival. See Annex 3 for trip report.

3. Project progress

3.1 Progress in carrying out project activities

<u>Biodiversity</u>

The baseline fish surveys of both Mamirauá and Amanã SDRs have now been completed. This was a major achievement given the scale of the areas. The seasonal variation in water levels means that there is a defined collection period of August to November. This is when water levels are low enough that the fish are concentrated and can be collected. The surveys have generated vast quantities of data that the processing has had to be separated into many intermediary steps. The results give clear ideas of species diversity and composition, temporal and spatial distribution and relative abundance.

The biologists are currently determining at which rate they can be harvested annually. To answer this question appropriately, we have to know in depth the reproductive biology of each species, and the structure of the population (in terms of ages and sizes). With this knowledge we can produce analyses that indicate the Maximum Sustainable Yield for each species. This is a fairly complex study since most of the species have never been investigated by science before anywhere in the world.

Our biologists/chief scientists are supervising a group of students (some undergrads and some Masters) working with thirteen indicator species. They are studying the population structure (age/size) and the reproductive biology (seasonality of reproduction, maturation size, fertility, spawning strategy, etc.) for each of them. We think we can have good results for the first seven by the end of July 2007, and for an additional four by the end of December 2007. The results of these analyses will be included in the Collection Area Management Plan as well as defining the sites of collection inside the collection area, to be specific about each species selected to be managed in terms the habitats and gears to be used, handling techniques, etc., and also in terms of quotas or removal rates).

There are an additional 15 or 20 species as candidates to sustainable management. In those cases, we will adopt two alternative strategies; either decide simply not to exploit them until new research is done about population structure and reproduction; or decide to apply to them some "adaptive management" approaches and based only on the abundances, the initial quota of animals to be removed, and populations monitored every year, to see the local impact of removal. From the results, we were able to put together the first 'fish list' - those fish it is feasible to extract sustainably from the reserves.

Our field biologists have been teaching high school students (approx. 30), undergraduate (approx 13) students and graduate students (approx. 5) in fish ecology and field studies techniques. This training has been delivered through formal lectures, field trips and by assigning research projects. Further details can be found in the annexes.

The results of the biological surveys have been fed back to the communities in the reserves. See Annex 2.

Socioeconomics

The baseline socioeconomic surveys have also been completed and the results analysed – 234 families were interviewed. The monitoring protocol includes indicators which the success of the project will be measured against. The results have been fed back to the communities in both reserves and can be found in Annex 4.

The socioeconomic team has supported the trade research by investigating the existing trade in ornamental fish from Tefé. This included talking to the government environment agencies, exporters, fish transporters and fishers.

The team has also been investigating the legal issues and employment law linked to setting up the community associations. They have established the inaugural meeting with the communities to discuss the administration and formation of the associations but the associations can only be legalised once the fishing activity has been completed. This is necessary due to the fact that once the associations are legally chartered, they will have to pay to all the taxes and services that registration of legal entities requires. Thus, the associations will be formalised only when products are ready to sell. See Annex 5.

The socioeconomic team has also been organising the community capacity building workshops for accountancy/administration; community associations; collection methods and best practice techniques. See Annexes 6-8.

Trade and business development

The business plan continues to evolve and now is able to incorporate the findings of the biological and trade investigations. See Annex 9. The business plan has also taken into consideration the regulatory constraints etc. Much consideration has been given to improving the monetary value of the product, as the first year of research indicated that our product would not command huge interest due to the species available. The concept of 'kits' is being trialled – different groupings of fish to represent different component of the Amazon, with supporting information on the location, fisher, water quality parameters, food preferences etc.

The best practice guidelines are being progressed with input from the Trade Advisor, Fish Husbandry expert, scientists and the trade. Detailed studies of the chain of custody were made

by following existing supply chain in the Rio Negro. Although the chain of custody appears to be well managed, there were simple things that could be improved on such as throwing by-catch back into the river rather than onto the floor and putting mesh lids on the packing crates to prevent fish loss.

Fish welfare

The best practice guidelines are currently being drawn together. The best practice guidelines apply to all stages of the supply chain from collection (materials of the nets), sorting and sizing, holding and shipping conditions. As discussed, these were developed by looking at the existing supply chain; experience from importing fish into the UK and scientific experiments – such as looking at the stress caused by overcrowding and behavioural traits.

We are now also planning the activities of capacity building for fishermen association, and a first pilot catch with those interested, focused only on discus (October 2007). This will serve many purposes: to test a good sampling and removal technique, to test best practices of handling, storing and transporting discus, to test our own capacity to build capacity among fishermen, to use the opportunity and spread the word in the market about Amanã as a potential source of ornamentals (using discus as flagship species).

3.2 Progress towards Project Outputs

Overall, good progress has been made towards achieving the project outputs.

Output1: We have a far greater understanding of the biodiversity of the ornamental fish species in the Amazonian flooded forest and Amanã black water habitats. This is the first time these species have been researched to such depth any where in the world. By understanding the life histories and ecology, the ecosystems can be managed to maintain populations at a natural level. To check this, a standard, repeatable monitoring programme has been established to ensure that the populations of the ornamental fish are maintained at this natural level.

The measurable indicators still hold true for this output. The training of the biologists is likely to be an underestimate as a greater number of biologists have been trained informally and formally.

Output 2: The social and economic parameters of the communities have been determined. This is the first time this has been achieved in the many of the Amanã villages and it is very interesting to see the differences between the two reserves due to the different livelihood options and resource availability – in Amanã, they are able to have small holdings as the land doesn't flood. The indicators have been set to measure any change in social or economic status at the result of a trade in ornamental fish in the households. Both results can be found in Annex 10

Now there is a provisional fish list, training is being provided to the interested fishers and the first trial collections of fish will be carried out in October 2007. This takes great steps in achieving the output of improving livelihood opportunities for the communities.

The measurable indicators will measure progress towards providing increased livelihood income for the communities. Training is being provided to the organisational build capacity of the community associations but the indicator is quite ambiguous as we will only know with success or failure and the level of support required by the communities at the end of the project.

Output 3: Market and economic research indicates that there is a commercial interest in the fishery – given the right price, quality etc. The business plan and trading procedures are being developed and tested, which will provide the structure and targets for the business.

The measurable indicator for this output is the establishment in a sustainable trade by May 2008. The key constraint on the meeting the project outputs is the collection season of the fish.

This unfortunately has fallen awkwardly in the project programme being August – November (and the baseline surveys didn't start in Amanã until January 2006 due to it not originally being in the proposal). Trial collections and shipments will take place in October 2007 but it is unlikely to be feasible to establish a full trade by the collection period in 2007, as we are still determining the life history traits to determine impacts of extraction at commercial levels. The next collection period commences August 2008 and so will lead to difficulties in meeting the May 2008 project finish.

Output 4: The procedures put in place (best practice in fishing techniques, holding, transportation, handling) will hopefully ensure that good animal husbandry conditions are put into place from source to end user and thus meet the output. The measurable indicators estimated a reduction in mortality by 80% along the supply chain. The studies on the chain of custody have shown that this might be very hard to measure and in fact mortality wasn't that high – thus meaning it is easier to achieve. However, there were key stages that mortality can be reduced significantly, such as reducing by-catch mortality rates.

3.3 Standard Output Measures

Table 1 Project Standard Output Measures

Code No.	Description	Year 1 Total	Year 2 Total	Year 3 Total	Year 4 Total	TOTAL
1B	One Brazilian PhD thesis prepared	ongoing	ongoing			
2	**Two Brazilian MSc research theses prepared**		1			1
4A	4 weeks biological training per year – 13 undergraduate students have received training	14	13			27
4B	Pro-rata approximately 10 weeks of training have been received	6	10			16
4C	2 post-grads have received training	2	2			4
4D	No. of weeks training – this is on-going with much coaching but 2 formal weeks	2	2			4
5	Junior sociologist is receiving informal training	1	1			2
6A	Training of the communities will take place in the following year.	0	0			0
6B	2 weeks participatory methods training. 4 weeks collection, husbandry and transportation skills training	0	0			0
7	*2* Training manuals, materials and documentation for biological and socio-economic research, collection, husbandry and transportation techniques for fishers and other handlers	2	In draft			2
8	Twenty-two working weeks spent in Brazil by technical staff from	9.6	11			19.6

	UK over the course of the project, including technical advice for collection scheme from Aquarist, project development and capacity building from UK project management team and trade advice from UK Trade expert.					
9	One Collection Area Management Plan	0	In draft			
10	Identification section within Biological Monitoring Protocol.	0	In draft			
11B	A paper for submission to a peer-reviewed journal.	0	1			1
12B	Biological database enhanced to include fish species, collection sites, methodologies	1	ongoing			1
13B	The species reference collection is enhanced when new species are found within the reserves.	1	ongoing			1
14A	A workshop to present and disseminate suggested guidelines to trade representatives and Brazilian officials and to discuss replication and certification opportunities.	0	0			0
14B	Other conferences presented at	3	5			8
15A	Five national press releases (Brazil)	1	0			
15B	Ten local press releases (Brazil)	1	0			
15C	Two UK national press releases	1	0			
16A	Three e-newsletters in Brazil, one UK newssheet, two magazine articles.	3	3			6
16C	1000 newssheets produced, circulation for magazine 25,000.	30,000	30,000			60,000
17	The organisational structure of the community strengthened to assist with the dissemination of techniques and training associated with the collection scheme and monitoring of resources. The improved communication between stakeholders along the chain of custody to develop and encourage the sustainable trade of freshwater ornamental fish.	0	In progress			
18A & C	One Brazilian TV feature	0	0			
18 B & D	One UK feature	0	0			
19 A-C	Radio features one Brazil national, 1x UK, 5 x Brazil	1	0			

20	Project physical assets of £15,000. A speedboat (£7000), survey equipment (£3000), floating storage facility for fish £4000 and a computer £1000.	£11,000	0			£11,000
21	Membership into fishers ornamental fish association to coordinate training and collection procedures for a sustainable trade in ornamental fish.	0	0			
23	Further funds raised	£2,000	0			

Table 2 Publications

Type * (eg journals, manual, CDs)	Detail (title, author, year)	Publishers (name, city)	Available from (eg contact address, website)	Cost £
Revista UAKARI, Journal of Mamirauá.	* Etnoecologia da Produção de Peixes Ornamentais num Sector do Médio Rio Solimões, Flona Tefé e Reservas Mamirauá e Amaná – Estado do Amazonas Marluce Mendonça, Mauricio Camargo v. 1 • n. 2 • p. 9-78 • nov. 2005	TBC	http://www.mamiraua.org.br/uakari/home.htm Also available from other libraries but key ones are: INSTITUTO DE DESENVOLVIMENTO SUSTENTÁVEL MAMIRAUÁ (IDSM) Biblioteca Av. Brasil, n.197 - Caixa Postal 038 Bairro Juruá CEP 69470-000 Tefé, AM BRITISH LIBRARY Legal Deposit Office - The British Library Boston Spa, Wetherby West Yorkshire LS23 7BY, United Kingdom	As determined by holding libraries.

3.4 Progress towards the project purpose and outcomes

We have made progress towards achieving the project purpose as there is strengthened capacity in the reserves and in Brazil in reserve managers, fishers, local communities and researchers/scientists. The biological surveys and research are supporting the development of the sustainable management plans. The awareness of how important the ornamental trade for

the riverine communities has been raised amongst government and as such the need to review the trade to make it competitive with the other Amazonian countries is beginning to filter through – albeit with effective management, the structure of which is currently not in place. The level of awareness about environmental issues has been increased within the trading circles as has the need to demonstrate good management.

The purpose level assumptions still hold true and the measurable indicators are adequate towards measuring outcomes.

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

Overall, the project will contribute significantly to the biodiversity of the fish populations of the Amazonian rivers ecosystem as we will have developed Brazilian ichthyological capacity and gained understanding of the ecology of these fishes that will lead to effective management of the ecoystems for their conservation. The project is putting the model in place that will allow the sustainable use of the natural fish resources. The model will be able to be applied elsewhere in the Amazon, where there is currently no control or regulation. The communities in the reserves will see increased benefits stemming from the conservation and the use of the biodiversity.

4. Monitoring, evaluation and lessons

The monitoring protocol continues as established in Year 1 of the project. A project monitoring and evaluation/planning workshop was held in September 2006 to review progress, enable decision making and plan this years work. This was a very productive process and will be repeated in 2007.

The indicators of achievement can largely be found in the annexes and highlighted in the logframe against the activities. We are still in the process of producing the outputs and so in some cases draft versions are included. Each of the attachments is steps towards achieving our project purpose. Each measurable indicator is an accumulation of much research and background work and decision making leading to achieving the project outputs and outcomes.

Lessons learned from this year include the amount of time it takes to produce the biological evidence to enable extraction to take place. This run-in time will need to be allowed for the biological monitoring that will inform the annual levels of extraction in the Collection Area Management Plan.

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

Sustainability: The project reviewer questioned the sustainability of the project. The whole project is a strategy to test sustainability of establishing a trade in ornamental fish and put the appropriate measures in place to ensure its viability on ecological, social and economic grounds. It is perhaps because we are looking so in depth at it that we highlighted the potential issues in the Annual Report and we have continued to implement our project addressing these issues in this following year.

Sustainability is absolutely at the essence of this project and this is why we are making sure we understand the fish ecology - the population structure (age/size) and the reproductive biology (seasonality of reproduction, maturation size, fertility, spawning strategy, etc.) for each species; economically by developing the business plan and socially through the capacity building. The business plan and collection area management plans will provide the tools to set out our strategy to achieve said sustainability. These will be reviewed annually by the communities

and the management committee of the sustainable development reserves to ensure their continued relevance and will be updated accordingly.

The project partners were surprised by the comments that we were not addressing sustainability as it is absolutely at the core of the Sustainable Development Reserves where we are working and which they manage.

The exit strategy will be in the business plan and collection area management plans. Working in the Sustainable Development Reserves is a slightly different situation as all economic activities involved with utilizing the natural resources have to be reviewed annually by the reserve management and science team to ensure sustainability and address any problems. As such, our project partners will have continued contact with the fishers, looking at log books, catch quotas etc as it is their responsibility to maintain the integrity of the natural resources.

Seasonality: the business plan has been developed to address seasonality. A holding facility has been secured at the exporter which will enable fish to be collected in large numbers and then held for demand-led distribution. This seasonality is encountered across the Amazon and so is used to being dealt with and appears not to hinder sales. The key issue is if enough fish can be caught in that period to meet demand and so make sufficient profit for the fishers. This is being tested in the business plan.

Desirability of fish: The fish are still desirable being “bread and butter fish” and with a few specialities such as the discus but are not the new and exciting species as always searched for by the trade. This is because of the positive fish list set by the government environment agency IBAMA i.e. only those on the list can be exported. Given our extensive scientific research and species management plan, there is opportunity to present a case to IBAMA to add new species onto the export list if we consider appropriate.

To address the lack of desirability, we have developed a marketing strategy that is hoped to add value to the fish by selling ‘collections’ of fish that will represent entertainment but also science, conservation and fair-trade. The collections reflect a range of fish of different values, representing various ecological niches, and which are important to key sections of the ornamental fish hobby. The ‘collections’ include Mamriraua *varzea*, Amanã *igapo*, surface dwellers, tetra community and so forth. The collections will be sold with accompanying information on the water quality, images of the fish collection area, fishers who caught the fish etc. Thus the customer receives intangibles not normally achieved in the pet shop experience.

A debate has already been started about the environmental and social benefits/disbenefits of ‘wild versus captive bred’ fish. A seminar will be convened at the Zoological Society of London to gain exposure about the debate. Magazine articles are also being penned for publication in the hobbyist magazines such as Practical Fish Keeping and the project will make use of internet polling of the readers to understand the hobbyist conceptions of the freshwater wild-caught industry.

Role of Darwin trainees at the end of the project:

Our MSc student, Rose, is now working in the natural resource management department for IBAMA, the Brazilian environment agency, in Belem where she resides. It is likely that the other biologists and sociologists that have been trained during the project will continue to work as icthyologists in academia or move to one of the government agencies, where they will apply the skills learned. A few of the high school students have gone on to register on biology undergraduate courses hopefully because they were inspired by the project. The Junior Sociologist who was employed by the project is likely to remain at Mamirauá.

Will there be a person in charge of continuing the project if is successful?

The business plan will take into consideration the costs of maintaining a post to oversee the project if deemed necessary. Details of the Project Management Plan are found at the back of the Business Plan in Annex 9. The project will also become one of the family of projects that are overseen by MSDR management committee to make sure that it remains viable and sustainable.

Are there still plans to hire a project manager?

There are still plans to hire a project manager but given the location, and salary – which was set in line with the staffing levels at MSDR, this has still not been possible. An administrator was taken on to support this position and the project management has been carried out between the Project Leaders. There is a new Senior Scientist, Henrique, who has just started in April 2007 to replace Mauricio, who has taken a lectureship post at the University in Belem (but will have a continued input into this project), who as a fluent English speaker, will facilitate the project management greatly, whilst also having a technical role.

Are there plans for involvement of other local organisations and/or government agencies?

The other local organisations, e.g. Project Piaba, University of Amazonas, and the government agencies are already involved in the project. Our trade advisor is working closely with Instituto SocioAmbiental, an NGO in the Amazon who work with the communities to maintain the culture, environment and social infrastructure of communities, to look at the future of the trade in the Rio Negro and make recommendations to ensure its survival for the riverine communities. This also involves working closely with the Instituto Nacional de Pesquisas da Amazônia (INPA) – Institute of natural resources of the Amazonia and the fishing associations. See Annex 22.

We are also working closely with IBAMA to develop management plans to control the trade in the silver arowana for the ornamental industry, which is currently be exported illegally from Brazil to other Amazonian countries. The fish are mouth brooders but are often killed to collect the juvenile fish and this is having detrimental impacts on the population numbers. IBAMA are considering legalising the collection as part of a managed programme although there are welfare considerations given the large size that the fish ultimately grows to.

Is the project trying to lever some funds from other sources?

Further funds have been sought from Petrobras, who funded some of the initial work. This has been initiated through our project partners. Money is also being sought from the trade association ACEPOA, but this will not be significant funds. We hope to apply to the FCO Global Opportunity Fund later this year as Brazil is a priority country.

Legacy:

The reviewer surmised that if there is no trade in ornamental fish – then there is no legacy. We do not believe this to be the case and our project partners believe that there will be a significant legacy from the project for Brazil and its biodiversity.

- There will be a good legacy through the conservation of biodiversity: this Darwin Initiative has enabled a far better understanding of the ecosystems in the Mamirauá varzea and Amanã igapos have been. For the first time, the population structure (age/size) and the reproductive biology (seasonality of reproduction, maturation size, fertility, spawning strategy, etc.) for at least 13 indicator species will be understood. From these results, we are able to manage the ecosystems to meet the commitments under the CBD
- There will be legacy through science; developing the scientific technical skills of junior biologists/ichthyologists in Brazil and natural resource management skills in Brazil, Bolivia and Columbia. Building the capacity of the technicians to implement the field work and mange fish collections. Building awareness of the importance of good fish husbandry/welfare.
- There will be legacy through influencing policy: working with the Brazilian government department's policy to influence the government to change the wildlife management protocols and encourage a trade that supports remote riverine communities without which would not have livelihoods and conserve biodiversity, such as with the silver arowana.
- There will be a legacy through strengthening institutional links between local NGOs, community associations, and government departments such as INPA and IBAMA and

raising the awareness of these government departments to the importance of this industry for the Brazilian Amazon.

- There will be a legacy from the creation of good scientific networks in the Amazon in the field of ornamental fish – a trade that has a significant impact on the riverine ecosystems of the regions

6. Other comments on progress not covered elsewhere

There has been no major refinements to the project over the last year – all developments and enhancements have been part of the business development and /science planning processes. Again the risks discussed in Annual Report 1, are being addressed through the business development process – differentiating our product, careful selection of exporters, importers etc.

A marketing strategy for the UK is currently being developed in detail and put into place including using hobbyist magazines and meetings/conferences to raise the profile of the project and increase demand. This will be the main focus of work over the next year in the UK. The creation of this demand and securing the customers will help achieve the exit strategy of having a sustainable trade in fish from Mamirauá and Amana.

7. Sustainability

The profile amongst the ornamental industry, academia, environmental NGOs and the appropriate government departments is quite high. The project is being invited to take part in government policy reviews and fisheries management measures in the Amazon, which are being sort through the increased profile of the industry as a whole. The project is in the unique position of working closely with all components of the trade chain (science, communities, and trade) and so is in a good position to make recommendations and help influence management for the benefit of all.

In the scientific world, our project has also been presented at the 8th national Ichthyologic meeting and the 7th international congress on wild fauna raising the profile of the novel research being undertaken. An annual meeting is also hosted by Mamirauá Institute for Sustainable Development (SCM under a different name) and all components of the project were presented. The project also attended the Barcelos Ornamental Fish Festival, which is an annual meeting where all those to are involved in the ornamental industry in the Amazon attend as well as a lot of international importers as well as representatives from the Ministry of State.

Sustainability has been discussed in Section 5. The exit strategy is to develop a sustainable (environmentally, socially and economically viable) trade in ornamental fish from the reserves. By being economically viable, the trade should generate enough money to cover the costs of an overseer if necessary. The social components will put the community/fisher association infrastructure in place to carry out the fishery and the Collection Area Management Plan will provide the biological limits to ensure sustainability.

With the project taking place in the Sustainable Development Reserves – the trade will be subject to annual review by the SDR management committee and scientific review by SCM. This will make sure that the sustainability and viability is being maintained after the finish of the project and will be able to assist if necessary.

8. Dissemination

Dissemination of the project activities and findings will be key in this next year when the results and management plans are developed. This year, the project was promoted at three conferences/congresses to scientists and fishery managers setting out the theory behind the development of the collection area management plans. The project activities were also

disseminated to industry, government and NGOs though workshops attended such as supported by the Associacao Brasilera de Aquaculture (Brazilian Association of Aquaculture) for the 1º Encontro de Negócios de Peixes Ornamentais (– first meeting to deal with ornamental fish) and the debates at the ornamental fish festival. See Annex 11.

The project was also disseminated through the SCM annual report that reaches the top environment/government tables in the Brazil. The project information sheets produced in 2006 are also continued to be distributed amongst stakeholders.

Dissemination activities will be continued in the host country after the end of this project by being a case study that can be referred to as an example of good management. This doesn't require further funding. The project website will also be established to help sell the fish which will also be another mechanism to disseminate the project activities. The project will also be continued through the fish collections and exportations and so will remain live.

9. Project Expenditure

Please expand and complete Table 3.

Table 3

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

Project summary	Measurable Indicators	Progress and Achievements April 2006 - March 2007	Actions required/planned for next period
Goal: *To draw on expertise relevant to biodiversity from within the United Kingdom to work with local partners in countries rich in biodiversity but constrained in resources to achieve* *The conservation of biological diversity,* *The sustainable use of its components, and* *The fair and equitable sharing of the benefits arising out of the utilisation of genetic resources*		*(report on any contribution towards positive impact on biodiversity or positive changes in the conditions of human communities associated with biodiversity eg steps towards sustainable use or equitable sharing of costs or benefits)* *The beginnings of an understanding of the population dynamics and the ecological niches of fishes of the iragapes and flooded forests of the Brazilian Amazon that have not been investigated before.*	*(do not fill not applicable)*
Purpose: Populations of ornamental fish species in MSDR protected through management within a sustainable ornamental fishery, made possible through strengthened capacity of fishers, local community, researchers,	Ornamental fish populations in MSDR remain at natural levels whilst accommodating controlled sustainable extraction of selected fish species by May 2008.	The biological surveys and research are supporting the development of the sustainable management plans. Strengthened capacity in the reserves and in Brazil in reserve managers, fishers, local	Building capacity/ training communities in collection methods; fish welfare/husbandry; accountancy/administration. Developing and marketing product in UK

reserve managers and national and international traders.	Two Organised Community Associations have demonstrated capacity to implement and manage the sustainable extraction of ornamental fish from within MSDR by May 2008. Best Practice Guidelines adopted by all links in the supply chain from MSDR to retailer by May 2008 to ensure the sustainable trade in ornamental fish.	communities and researchers/scientists. The awareness of how important the ornamental trade for the riverine communities has been raised amongst government and as such the need to review the trade to make it competitive with the other Amazonian countries is beginning to filter through – albeit with effective management including Best Practice, which is currently not in place.	Trial shipments of fish to UK Holding conference in Brazil to consult on Best Practice Guidelines etc. Raising awareness of the importance of the trade to the riverine communities.
Output 1. 1. Biodiversity of ornamental fish species in MSDR assessed, and a standardised, repeatable monitoring programme established. [Populations of ornamental fish in the MSDR are maintained at a natural level.]	1.1 MSDR ornamental fish population surveyed to document species present and population abundance within the designated fishing zones. The results written up and disseminated by May 2006. 1.2 Ornamental fish stock monitoring protocol completed by August 06 for the Collection Area but which may be applied in a wider Amazon context. 1.3 Collection Area Management Plan (CAMP) for ornamental fish extraction completed by April 2008	MSDR and ASDR ornamental fish populations surveyed with relative abundance figures defined. The results have been fed back to the communities. The detailed analysis of the results is still being undertaken as vast quantities of data were generated. Ornamental fish monitoring protocol completed. This is currently being peer reviewed. The Collection Area Management Plans are living documents and are continually being updates as the component parts develop.	

	to ensure its sustainable management. 1.4 At least four biologists trained in scientific survey techniques to assess and monitor fish populations through three training courses run by Head Scientist on an annual basis commencing August 05.	Two Masters students have started this year building on the PhD and MSc students of Year 1. A far larger training/capacity building programme has been implemented than proposed training highschool, and undergraduate students in fish ecology (concentrating on the ornamental species) and field techniques including developing questionnaires. See Annex 20 and 21. The indicators are fine in the development of the survey protocols but do not indicate whether the monitoring protocol is being implemented.
Activity 1.1.1 Biological survey protocol approved by August 05.		Completed. Annual report 1
1.1.2 Baseline fish surveys of the designated fishing zones completed and written up by June 06.		The baseline fish surveys have been completed in MSDR and ASDR. The surveys have been largely written up although they are waiting review by the SCM Chief Scientist. The delay is due to the fish collection period only finishing in January 2007.
1.1.3: Results of the baseline biological surveys presented to the communities by June 06.		The results of the baseline surveys have been presented to and discussed with the communities of MSDR and ASDR. See Annex 4
1.2.1 Fish species that are ecologically and economically suitable for extraction listed.		This is a dynamic list with biological and economic factors influencing species inclusion. An example is given in Annex 12 and Annex 13.
1.2.2: Biological monitoring protocol agreed and adopted by August 06.		Biological monitoring protocol has been developed and is currently being peer reviewed.
1.3.2: Supporting information for CAMP collected by project team by May 2006.		Supporting information for the CAMP has been collected.

1.3.3: Draft CAMP completed and peer-review comments incorporated by June 07.		The draft CAMP is being developed as the results on the investigation into fish abundance and life histories progresses. There a further series of reviews planned.
1.4.1: Biological survey team trained to follow Collection Area monitoring protocol in June 2006 to commence survey work in July 2006.		The team has been instrumental in developing the monitoring protocol and so are fully up to speed on the techniques. The new team members are trained during their inaugural field excursions.
1.4.2: First annual Collection Area monitoring completed and written up by May 2007.		Collection Area monitoring will take place during the fish collection periods, which we now know are September to November.
1.4.3: This is to be repeated annually *ad finitum*.		On going
1.4.3: Biological survey team trained in survey techniques by HS July 2005, 2006 and 2007.		See Activity 1.4.1.
Output 2. Social and economic parameters of community determined and monitored, local knowledge and needs identified, and feedback loop established. [Increase livelihood opportunities from extraction of sustainable levels of ornamental fish lead to increased income for households in MSDR].	2.1 Households that have elected to be involved in the project benefit from an increased income of 10% due to the new fishery by 2008. 2.2 Two Community Associations have the organisational capacity to effectively manage and monitor a sustainable trade in ornamental fish in MSDR by May 2008.	Household that have expressed an interest in the project will take part in the workshops thus progressing towards establishing a trade. Like all indicators established prior to the project, it was difficult to gauge how accurate the indicator is as the socio economic surveys and business plans were conducted during the project. Research into the appropriate community association structure has been conducted and the best approach agreed. Workshops have been organised to train the communities in accounting and business admin; collection methods; community organisations; and the best practice guidelines during 2007.

Activity 2.1.1 Socioeconomic survey protocol agreed by September 05	Survey protocol completed and implemented. (See Annual Report 1)
2.1.2: Communities and individuals to be involved in the project determined and agreed by December 2005.	The socio economic surveys identified those communities who were interested in establishing an ornamental fishery.
2.1.3: Baseline socio-economic surveys of identified MSDM communities and fishers completed by May 2006.	The baseline socioeconomic surveys have been completed and 233 families were interviewed. See Annex 10 for the findings of the socio economic survey
2.1.4: Socio-economic monitoring protocol agreed by August 2006 that will include indicators to measure the socio-economic impact of the trade in ornamental fish on the communities.	Socio economic monitoring protocol was developed and reviewed. The socio economic indicators were refined. See Annexes 10 and 14
2.2.1: Socio-economic survey team including community promoters trained in survey protocol by October 2005.	The socio economic team continue to work with the communities of MSDR and ASDR. The junior socio economist is gaining much experience and is continually developing her capability. Undergraduate students were also used to collect some of the fisheries data.
2.2.2: Results of the baseline socio-economic surveys presented to the communities by June 06.	The results of the baseline socio economic surveys have been written up, presented to and discussed with the communities of ASDR. This was done in conjunction with presenting the biological results. A report on the consultation can be found in Annex 4.
2.2.3: Through a process of consultation, communities endorse Best Practice Guidelines[i] by September 2006.	The Best Practice Guidelines (BPG) is currently still being developed and so has not been presented to the communities. The BPG will be discussed with the communities at a planned workshop in September, where they will be able to provide feedback before they are finalised.
2.2.4: Fishers trained in Best Practice Guidelines to be independently assessed as competent by May 2008	The fishers will be trained in the BPG at a collection handling workshop September 2007. See Annex 8

2.2.5: Community organisations formed, officially registered and membership protocols agreed by September 2007.		The inaugural meeting regarding administration and formation of associations for the community organisations will be held June 2007. The associations will only be legalised when the activity has been initiated. This is necessary due to the fact that once the associations are legally chartered, they will have to pay to all the taxes and services that registration of legal entities requires. Thus, the associations will be formalised only when products are ready to sell. See Annex 5 and 6 for a discussion paper on the appropriate association structure.
2.2.6: Training of designated personnel from community associations in business management, accounting reporting etc. to ensure that they are verified as competent by May 2008.		The provision of the necessary training of fishers that enables them to maintain accounts and document production activities regarding the management of ornamental fish will be undertaken in December 2007. See Annex 7
Output 3. Market and economic potential for fishery identified, a business plan and standardised guidelines in place for trading procedure from source to end-user.	3.1 A sustainable trade in ornamental fish is established from the MSDR by May 2008. 3.2 Standardised Best Practice Guidelines are adopted by May 2008 for the sustainable trade in ornamental fish from MSDR that are transferable and can be applied in a wider Amazonian context.	The steps are being taking towards establishing a sustainable fishery. The key issue at the moment is to gain a greater understanding of the life history of the indicator species so that sustainable off-take can be achieved. The Best Practice Guidelines are being drafted in consultation with the key stakeholders.
3.1.1: Industry analysis undertaken on UK and European fish trade with particular reference to Brazilian ornamental fish. Report produced by December 2005.		The UK industry analysis was completed as discussed in Annual Report 1. See Annex 15

3.1.2: Industry analysis undertaken on Brazilian fish trade with particular reference to fish exported from Manaus, Brazil, by December 2005 to include current trade pathways/systems.		The Brazilian industry analysis was completed. See Annex 16 and Annex 17, where a paper on the Tefé ornamental industry can be found.
3.1.3: Current and where possible future trade regulations identified by April 2006 to include taxes, custom requirements, health and welfare procedures in Brazil, UK, Europe, Japan and US.		Regulatory constraints have been investigated and where they exist, have been included as part of the trade analysis and business planning.
3.1.4: Business plan drafted and reviewed by project team by June 2006 to include scenarios to advise selection of fish species list. Business plan to be reviewed annually.		The Business Plan is a working document that is regularly updated when results of our investigations are realised. The latest version can be found in Annex 9.
3.1.5: Implementation of ornamental fish business plan by May 2008.		The Business Plan is being implemented as the project is established.
3.2.1: Existing natural resource certification/guidelines are assessed and potential applicability determined by December 2005.		Completed - see Annual Report 1. The findings of the research will be used to develop the Best Practice Guidelines.
3.2.2 Produce and peer review standardised Best Practice Guidelines for the sustainable trade in ornamental fish. Draft by June 2006 and Final June 2007.		Draft Best Practice Guidelines have been produced. See Annex 18 and Annex 19.
3.2.3: Peer review standardised Best Practice Guidelines are adopted by fishers, managers, communities, traders, exporters, importers and retailers by May 2008		The Best Practice Guidelines have been developed in consultation with the industry. Once completed they will be circulated for comment.
3.2.4: Procedures for trade documentation, verification of compliance to standards, auditing and feedback procedures developed and implemented by May 2008.		These are being developed as part of the Best Practice Guidelines.
Output 4 Fish welfare maintained from source to end user	4.1 Ornamental fish welfare secured by achieving 80% reduced mortality along the supply chain from 2008.	Our studies following the chain of custody highlight the key areas where fish mortality can be reduced, such as during the sorting process and during transport between holding stations.

4.1.1 Recommendations for improved welfare by May 2006. Water quality parameter standards within defined optimum values achieved on 90% of shipments by May 2008		The chain of custody for the ornamental fishery was followed on the Rio Negro – another tributary of the Amazon – from collection to the holding and export facilities. Key areas for improvement were highlighted.
4.1.2 Best practice guidelines produced for animal welfare from capture to consumer by May 2007.		Draft Best Practice Guidelines have been produced and can be found in Annex 18 and 19. Research continues on the best possible shipping conditions. A decision tree to help species choice was developed Annex 13.
4.1.3 Communities, exporters and importers implementing Fish Welfare Best Practice guidelines by May 2008		The choice of exporter has been supported by welfare considerations – see Business Plan. The selected exporter has been involved in developing the Best Practice Guidelines.

Annex 2 Project's full current logframe

Annex 3 onwards – supplementary material (optional)

Checklist for submission

	Check
Is the report less than 5MB? If so, please email to Darwin-Projects@ectf-ed.org.uk putting the project number in the Subject line.	
Is your report more than 5MB? If so, please advise Darwin-Projects@ectf-ed.org.uk that the report will be send by post on CD, putting the project number in the Subject line.	
Do you have hard copies of material you want to submit with the report? If so, please make this clear in the covering email and ensure all material is marked with the project number.	
Have you completed the Project Expenditure table?	
Do not include claim forms or communications for Defra with this report.	

[i] Standardised guidelines are to include: ecosystem management which comprises the Collection Area Management Plan; collection methods, handling and storage; logistics and transportation from source to retailer which included husbandry and fish welfare; administrative and accounting procedures. To be defined further.