

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)	Sociedade Civil Mamirauá (SCM)
Darwin Grant Value	£218,000
Start/End dates of Project	June 2005 – March 2009
Reporting period (1 Apr 2006 to 31 Mar 2007) and annual report number (1,2,3..)	1 Apr 2007 to 31 Mar 2008 Annual Report No. 3
Project Leader Name	Alison Shaw
Project website	
Author(s), date	Alison Shaw, 15 April 2008

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.

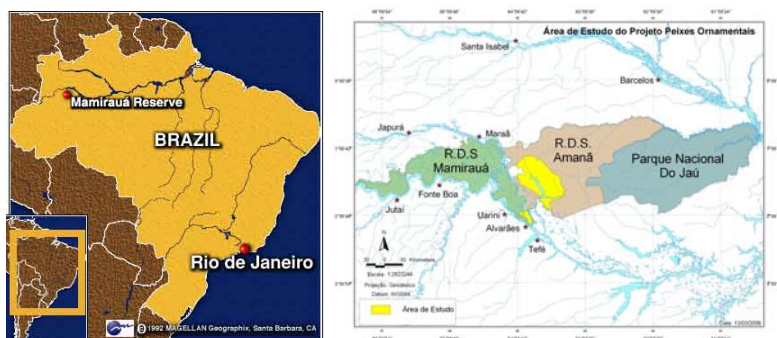


Figure 1: Project location

2. Project Partnerships

The project partnership between ZSL and SCM continues well. Another project planning workshop was held in Tefé in September/October 2007 with all the team members attending. This is always a useful exercise so everyone can present their research for the year and bring everyone up to speed with all the different components of the project. A senior biologist/Project Manager was recruited who has made a big difference in driving the project forward and in reporting activities.

This year has been focussed on consolidating our biological surveys in order to build the Collection Area Management Plan. Papers have been presented at regional conferences. Good connections are being built in IBAMA, the national institute for the environment, particularly looking at developing management plans for the extraction of fish species. The project has also developed links with Federal University of Amazonia (UFPA) and in December, Dr. Rossineide Rocha from Histology Laboratory of UFPA visited the research station in Tefé. The project has made an agreement with this lab in Belém, and they will provide the capacity and the facilities and training for histological analyses that will support our macroscopic gonad analyses and which will enrich our assessments on a general understanding of the reproductive process. Our biologists also visited the histology labs at the university in Belem.

This year, the Darwin Initiative has helped the host country institution to build their capacity to meet the Convention on Biological Diversity (CBD) notably by:

- "...promoting sustainable development through the liberation of trade and by establishing reciprocal support between trade and the environment"
- "...fighting poverty by income generation and greater control over local resources by local people, backing local institutions and providing institutional and technical strengthening and increased involvement in non-governmental organisations and local authorities as agents of this implementation and developing healthy and sustainable management strategies for the environment within poor areas, thereby protecting resources, reducing poverty and generating employment and income."
- "...conserving biological diversity by improving the conservation and the sustainable use of biological resources, in conjunction with needs identified by the CBD, and to ensure the fair and equitable share of benefits and of biological resources and improving the scientific understanding and economic importance of biological diversity and its function in ecosystems".

3. Project progress

3.1 Progress in carrying out project activities

Biodiversity

The baseline fish surveys of both Mamirauá and Amanã SDRs have now been completed although more targeted surveys continue, such as into the Loricarid family. The team of eight biologists in Brazil have been working hard to understand the taxonomy, reproductive behaviour and lifecycle of many of the ornamental fish. The species were selected by looking that the population data and their suitability/interest for the aquarium trade and if deemed suitable for extraction will be included in the list of fish species to be traded. The following is a summary of some of the activities:

- We have completed seven loricarid collections in Amanã, and four in Mamirauá. We have a good idea of which loricarid species can be inserted on the list on both reserves. The identification of the species will be concluded mid-May.

- We have set up series of experiments looking at growth and maturity of discus to look at the reproductive cycle. The team will have a good evaluation of the reproductive cycle by April, May 2008.
- A study has been undertaken by a master student (Tulio) into the identification of *Hypshobrycon* species. We have a good diagnosis for the species. Tulio will start his Masters at INPA (Manaus) by March and will be working with the material collected by our researches.
- All types *Apistogramma* collected have been identified (quite difficult). They have found five different species, instead of eight previously classified, with a probable new species, very common in Amanã.
- Carol has finished the macroscopic gonad analysis of *Apistogramma hipollytae* and has started the dissection of *Apistogramma agassizii*. The analysis of the latter species is to be concluded by mid-April. Carole has concluded her master's credits and will proceed with reproductive and population studies of the four *Apistogramma* species remaining.
- Nagila has finished the reproductive studies of *Copella nigrofasciata* based on both macroscopic gonad analysis and histological analysis. We have started to write a manuscript for submission to a specialized journal. This might be concluded by early May 2008. The results have been incorporated into the CAMP. She has already started the reproductive studies of two species of *Nannostomus*. She is planning to conclude the analyses needed for CAMP for a first species by March and for both by April.
- Nagila has also finished the macroscopic gonad analysis with *Nannostomus eques* another Lebiasinidae selected for the management.
- Fabio (the intern student that arrived in January) has concluded the macroscopic gonad analysis for *Carnegiella marthae* and is starting the statistical analysis on that species. He will also do the same for *Carnegiella strigata*.
- Camilla (the new researcher) is about to finish the macroscopic gonad analysis of *Crenuchus spilurus*. By the end of April she will have completed the dissection and started the general analysis.
- Henrique (senior biologist/Project Manager) has just finished the 1st publication about Amazonian fishes, a description of a new species of *Rivulus* from Amanã reserve. We have submitted this paper for the journal *Ichthyological Exploration Freshwaters*.

The CAMP is being updated by the Host Country Project Leader and Chief Scientist as the information gets to him. The senior biologists are also contributing. There are now 26 species included in the species list as suitable for extraction.

Our field biologists have also been teaching high school students (approx. 30), undergraduate (approx 8) 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.

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

Socioeconomics

A training workshop was held with the interested communities in Amana Reserve in September 2007. This focused on developing skills in fish collecting; handling and management. Supporting information can be found in Annexes 3-5. A similar meeting in Mamirauá reserve was performed successfully in January 11th. The third capacity building workshop for Amanã fishermen, planned to happen in December, was held in the community of Kalafate (Amanã Lakeshore) in March. The issues viewed were related to the management of an association and monitoring the business.

Our socioeconomist, Leonardo has been undertaking monthly visits to Amanã reserves to discuss the creation of the Ornamental Fishermen Association (OFA) and to start discussing the CAMP and the proposed zoning system. The meetings also provide opportunity to feed back the results to the communities. It was decided that the most suitable structure for the OFA was a sub-group of the general Association for Amana reserve. We expect that this legalizing process to conclude by late April.

Trade and business development

A proposed species list of fish suitable for extraction based on biological and economic potential has been agreed and can be found in Annex 6.1 and 6.2.

We have made the first trial for transporting fishes from Amana to Tefé. It was very successful. A total of 60 discus was transported and just a single fish died on the process. This trip was accompanied by Nagila and Camilla who measured temperature, conductivity, pH and Oxygen levels during the entire trip. They also measured behavioral features related to stress.

The Ornamental Aquatic Trade Association (OATA) has this year produced guidelines on water quality and transportation of aquatic species. These are now being accepted as industry standards. As such, there is not quite the need to produce our own best practice guidelines. Instead, we will try to make them accessible to the industry in Brazil and promote their adoption. Saying this, we have produced a guide for the communities for best practice in fish collecting and handling.

We have selected the most suitable exporter in Manaus, who has the highest quality standards. We are currently negotiating with him to export the fish. In order to give the best possible chance to the trade, we will try to make the fish available to all markets including US, mainland Europe as well as the UK. Whilst we lose control of the chain of custody, it means that there is a greater market which is considered important given the competition. The fish will be marketed through the website, which is currently being built and will contain the 'biotope' tanks a discussed in Year 2 and will give details of how to purchase the fish. Articles are currently being written for trade and hobbyist magazines including Practical Fishkeeping. We are also putting together promotional packages for the trade fairs this year including the OATA conference in the UK in October, which will invite the senior biologist over for.

In the UK, we are making progress with identifying suitable importers (a new company called Sustainable Sourcing) which has good contacts with retailers.

We have hopefully negotiated a small shipment of fish to New York of many species for the American market that may act as a showcase for the project and the future trade – our first customer.

Fish welfare

Training has been given to the fishers in best practice in fish collecting and handling incorporating the improvements that were identified during transportation observations last year. Trial shipments have been made from the collection site to the shipping town and further water quality and indicators of fish stress were measured.

As part of the negotiations with the importer in the UK, we hope to be able to monitor which is the best way of transporting the fish for minimum stress and mortality, including packing densities, pre-shipment treatments etc.

3.2 Progress towards Project Outputs

The Darwin Initiative has kindly granted an extension to the Project to March 2009 to allow for the seasonal fishing period. We are working hard to make the first collecting season a success with the consequent shipments of the fish, and hopefully their sale. If this is successful, we will have completed the project outputs but obviously it is likely that we will need to provide continued support of the following years.

Output1: *Populations of ornamental fish in the MS DR are maintained at a natural level.*

1.1 MS DR ornamental fish population surveyed to document species present and population abundance within the designated fishing zones.

This has been completed in Mamiraua as well as Amana Sustainable Development Reserves. The fishing zones have been designated as outlined in the CAMP. Annex 7

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.

This has been completed and is included in the CAMP.

1.3 Collection Area Management Plan (CAMP) for ornamental fish extraction completed by April 2008 to ensure its sustainable management

Whilst this is a working document and will continually be updated and reviewed, the final version for the first collection period is almost complete.

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

The training of the biologists is likely to be an underestimate as a greater number of biologists have been trained informally and formally including high school students, undergraduates and postgraduates.

The measurable indicators still hold true for this output.

Output 2: *Increase livelihood opportunities from extraction of sustainable levels of ornamental fish lead to increased income for households in MS DR*

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

The social and economic parameters of the communities have been determined and so the measurable increase in the household income should be measurable. We are poised to start trading and so at this point we will know if we have achieved the output, although it will be out of the project timeframe.

2.2 Two Community Associations have the organisational capacity to effectively manage and monitor a sustainable trade in ornamental fish in MS DR by May 2008.

The establishment of the Ornamental Fishing Association is nearly complete and training has been provided to the fishers. 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 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 MS DR by May 2008.

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 – this has now been deferred to March 2009. We are in negotiations with an exporter and an importer and by March 2009, we will know if the first six-months of trade have been successful

3.2 Standardised Best Practice Guidelines are adopted by May 2008 for the sustainable trade in ornamental fish from MS DR that are transferable and can be applied in a wider Amazonian context

The ornamental industry has produced standard guidelines during this year. Our research has shown that there is quite good standards within the collectors and shippers, as it is in everyone's best interests if the fish stay healthy and alive. Small recommendations have been made which will be incorporated into the Amana and Mamiraua shipments for best practice; these hopefully will be adopted by the main exporter (with minimal cost) and so will hopefully become industry norm. See Annex 8.

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

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.

When the international trade commences we will be able to monitor along the whole supply chain and will be able to make further recommendations, hopefully by March 2009.

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	On going	On going	On going		
2	Two Brazilian MSc research theses prepared		1	2 in prep		2
4A	4 weeks biological training per year	14	13	Min of 6		33
4B	Pro-rata approximately 10 weeks of training have been received	6	10	6		22
4C	2 post-grads have received training	2	2	2		6
4D	No. of weeks training – this is on-going with much coaching but 2 formal weeks	2	2	2		6
5	Junior sociologist is receiving informal training	1	1	3		5
6A	Participatory learning (no of weeks training – approx 40 individuals 1-3 day workshops. Three workshops)	0	0	40		40
6B	2 weeks participatory methods training. 4 weeks collection, husbandry and transportation skills training [actual no of weeks training: approx 40 individuals for each 1-3 day workshop. Three workshops = 480 days = 96 learning weeks)	0	0	96		96

Code No.	Description	Year 1 Total	Year 2 Total	Year 3 Total	Year 4 Total	TOTAL
7	Two training manuals, materials and documentation for biological and socio-economic research, collection, husbandry and transportation techniques for fishers and other handlers	2	In draft	1		3
8	Twenty-two working weeks spent in Brazil by technical staff from 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.	9.6	11	4		23.6
9	One Collection Area Management Plan	0	In draft	Final draft		
10	Identification section within Biological Monitoring Protocol.	0	In draft	In CAMP		1
11B	A paper for submission to a peer-reviewed journal.	0	1	2 in draft		1
12B	Biological database enhanced to include fish species, collection sites, methodologies	1	On going	On going		1
13B	The species reference collection is enhanced when new species are found within the reserves.	1	On going	On going		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		0
14B	Other conferences presented at	3	5	2		10
15A	Five national press releases (Brazil)	1	0	0		1
15B	Ten local press releases (Brazil)	1	0	0		1
15C	Two UK national press releases	1	0	In prep		
16A	Three e-newsletters in Brazil, one UK newssheet, two magazine articles.	3	3	3		9
16C	1000 newssheets produced, circulation for magazine 25,000.	30,000	30,000	0		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	0	In progress	Near completion		

Code No.	Description	Year 1 Total	Year 2 Total	Year 3 Total	Year 4 Total	TOTAL
	of freshwater ornamental fish.					
18A & C	One Brazilian TV feature	0	0	0		0
18 B & D	One UK feature	0	0	0		0
19 A-C	Radio features one Brazil national, 1x UK, 5 x Brazil	1	0	0		1
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	Near completion – approx 40 members		
23	Further funds raised	£2,000	0	0	0	2,000

Table 2 Publications

Type * (e.g. journals, manual, CDs)	Detail (title, author, year)	Publishers (name, city)	Available from (e.g. contact address, website)	Cost £
Journal	A description of a new species of <i>Rivulus</i> from Amanã reserve. Henrique Lazzarotto de Almeida. 2008	Ichthyological Exploration Freshwaters		

3.4 Progress towards the project purpose and outcomes

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 anywhere 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.

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. This was demonstrated by the visit by the Brazilian Minister of Fisheries to the Barcelos Fish Festival in January 2008. 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 ecosystems 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 human communities in the reserves will see increased benefits stemming from the conservation and the sustainable 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 workshops were held in September 2006 and 2007 to review progress, enable decision making and plan this year's work.

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 importance of having the right people in position to drive the project forward. By recruiting a senior biologist/project manager who is committed to the project, we have been able to take it forward at a fast pace and convince project partners of the need to include particular aspects of the project – such as broadening the species list to make it of more commercial interest.

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

In response to the review, once we were sure that our host country project partners were okay to try a collection in the 2008 fishing season, we secured an extension to the project.

With reference to the silver arowana paper, we are trying to secure the management documents and will forward to Darwin as soon as we get them.

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 and 2, are being addressed through the business development process – differentiating our product, careful selection of exporters, importers etc.

We are currently implementing a marketing strategy to promote the Mamiraua Fish including writing articles for hobbyist and trade magazines and meetings/conferences to raise the profile of the project and increase demand. This will continue to be the main focus of work over the next year in the UK, whilst they carry on with the biological research in Brazil. 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.

Mamiraua have also been developing closer links with the IBAMA officials in charge of the ornamental trade and management, about the development of management plans for the fisheries and adding additional fish to the list of fish allowed to be exported from Brazil.

The difficulties encountered and steps taken to overcome them have been discussed in the previous annual reports. The same risks to the ultimate success of the project in setting up the trade exist and we continue to address them by diversifying our projects; creating specialist niches; trading on the name of the reserves and through sustainable sourcing channels; identifying the most respected exporters and trying to retail the fish through the most suitable outlets for the identified customer.

7. Sustainability

The profile of the project remains to be high within the country. Two of our biologists are completing their masters at similar research institutes (INPA and University of Belem). Partnerships and exchanges with the Federal Universities and the government natural resource research institutes (INPA) are helping to generate longevity from the project for fish conservation contributing to achieving the project purpose. There is high demand from students within Brazil to work and do placements with the project which gives some evidence of increasing interest and capacity for conservation of biodiversity through the next generation of ichthyologists.

By developing close links with IBAMA, the project will hopefully be able to provide a protocol for management plans for any new ornamental fish that are extracted or for new areas of exploitation. The team continue to be invited to take part in government policy reviews and fisheries management measures in the Amazon, which is being sort through the increased profile of the industry as a whole.

The project was promoted at the Mamirauá Institute for Sustainable Development (SCM under a different name) annual meeting and all components of the project were presented.

The exit strategy remains 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

The project website is being developed in Tefé, which will be the gateway into the ornamental fish project. It will provide information on the fish species being collected; fishers who are collecting them; best conditions to keep the fish in; how to acclimatise the fish; associated fish to keep; recommendations for 'biotope' tanks as well as how to buy the fish. The target audience for the website is fish hobbyists and collectors; fish importers and retailers and public and commercial aquaria. We will also be producing flyers to signpost the website as well as placing articles into magazines. This website is being set up in Brazil so it can be maintained and managed within Brazil, after the end of the project.

A few hobbyist and trade magazines have expressed interest in writing articles on the project to promote the findings and also, hopefully, raise demand for the fish and so we are currently drafting these. The timing of all this is obviously important as the fish need to be available.

We have submitted an application to ZSL to host a two day seminar on the ornamental industry in 2009/10, which will also continue the life of the project although this will be in the UK.

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.

9. Project Expenditure

Please expand and complete Table 3.

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

Item	Budget (please indicate which document you refer to if other than your project schedule)	Expenditure	Balance
Rent, rates, heating, overheads etc			
Office costs (e.g. postage, telephone, stationery)			
Travel and subsistence			
Printing			
Conferences, seminars, etc			
Capital items/equipment			
Others			
Salaries (specify)			
Alison Shaw, Project Leader and Manager			
Project Manager			
Greg Prang, Trade Analyst			
Clarice Santos, Administrator			
Alexander Hercos, Biologist			
Marluce Mendonca, Sociology coordinators			
Leonardo Carneiro Mattos, Sociology coordinator (replaces Marluce)			
Community Promoters (3)			
Biologist – Raimundo Nonata			
Biologist – Renaison Ajouro			
Biologist – Carolina			
Biologist - Sebastao			
Biologist – Camila			
Biologist – Nuglia			

Total Salaries	33,500	21,878.65	11,622.16
TOTAL	70,000	44,678.08	25,321.92

Highlight any agreed changes to the budget and explain any variation in expenditure where this is +/- 10% of the budget.

Staff costs

It was agreed in the absence of the project manager that additional salary could be allocated to the Project Leader and Trade Analyst and administrative support recruited. This remaining balance has not been claimed this year (07/08) but will be used to cover salary costs as agreed in 2008/09.

Staff costs are under spent. This is because the project started in June 2005 and the staff recruited in the following months. The project budget was put together to match the Darwin financial year and so did not take this into account.

Office costs

After the Trade Analyst/Project Manager left the project in July 07, we did not keep up the Manaus office and so office costs are less than expected.

Printing

The printing budget is under spent as the biological reports and CAMP are currently in electronic format. This is in line with the principles of sustainability. Guidance for communities will be produced in hard copy.

Capital Items

There is an underspend for capital items. The delay in completing the baseline fish surveys by including Amana Sustainable Development Reserve (SDR) as well as Mamiraua SDR has meant that the decision about how best to transport the fish is has been delayed. As such, the fit out of the necessary boats/holding facilities will not take place until later this year.

Conferences/Seminars

There is an under spend on Conferences and Seminars. Local training courses and workshops were held. Representatives from the project will be attending and presenting at an international trade conference in the UK 2008 and holding seminars at ZSL 2008/09 and so spending has been deferred to the next financial year as agreed with Darwin Initiative.

Annex 1 Report of progress and achievements against Logical Framework for Financial Year: 2007/08

Project summary	Measurable Indicators	Progress and Achievements April 2007 - March 2008	Actions required/planned for next period
<p>Goal: <i>To draw on expertise relevant to biodiversity from within the United Kingdom to work with local partners in countries rich in biodiversity but constrained in resources to achieve</i></p> <p><i>The conservation of biological diversity,</i></p> <p><i>The sustainable use of its components, and</i></p> <p><i>The fair and equitable sharing of the benefits arising out of the utilisation of genetic resources</i></p>		<p><i>(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)</i></p> <p>A greater 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 to implement a management plan that will ensure their conservation; through the fair and equitable sharing of the resources by the local communities in the reserves.</p>	<p><i>(do not fill not applicable)</i></p>
<p>Purpose: Populations of ornamental fish species in MS DR protected through management within a sustainable ornamental</p>	<p>Ornamental fish populations in MS DR remain at natural levels whilst accommodating controlled sustainable extraction of selected</p>	<p>The biological surveys and research are supporting the development of the sustainable management plans. The Collection Area Management Plan (CAMP) is</p>	<p>Implementation of the Collection Area Management Plan during fish collection in October 2008.</p>

<p>fishery, made possible through strengthened capacity of fishers, local community, researchers, reserve managers and national and international traders.</p>	<p>fish species by May 2008.</p> <p>Two organised Community Associations have demonstrated capacity to implement and manage the sustainable extraction of ornamental fish from within MSDR by May 2008.</p> <p>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.</p>	<p>near completion.</p> <p>Strengthened capacity in the reserves and in Brazil in reserve managers, fishers, local communities and researchers/scientists through three training workshops in collection methods, fish welfare/husbandry and log keeping.</p> <p>The Minister of Fisheries visited the riverine communities to learn more about the ornamental fish industry and its importance demonstrating the increased awareness of how dependent the communities are on the industry. Consultations on how to manage and secure the industry continue. In 2007 and 2008, the Ornamental Aquarium Trade Association (OATA) have produced industry guidelines on the best practices with regard to transporting fish and water quality, which will be adopted for this project but made user-friendly.</p>	<p>On going support for the communities in the early stages of the enterprise including dealing with exporters; transporting fish; accounting etc</p> <p>Securing exporters, importers and retail outlets for the fish. Developing and marketing product in Europe and US.</p> <p>Trial shipments of fish to UK due in October 2008 to trial best practice transportation protocols.</p>
<p>Output 1. 1. Biodiversity of ornamental fish species in MSDR assessed, and a standardised,</p>	<p>1.1 MSDR ornamental fish population surveyed to document species present and population</p>	<p>MSDR and ASDR ornamental fish populations surveyed with relative abundance figures defined. The results have been fed back to the communities. Detailed research into the life history of a further eight</p>	

<p>repeatable monitoring programme established.</p> <p>[Populations of ornamental fish in the MSDR are maintained at a natural level.]</p>	<p>abundance within the designated fishing zones. The results written up and disseminated by May 2006.</p> <p>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.</p> <p>1.3 Collection Area Management Plan (CAMP) for ornamental fish extraction completed by April 2008 to ensure its sustainable management.</p> <p>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.</p>	<p>ornamental fish species.</p> <p>Ornamental fish monitoring protocol completed. It is being incorporated into the CAMP.</p> <p>The Collection Area Management Plans are living documents and are continually being updates as the component parts develop. The fish life history results have been incorporated and extraction quotas have been decided for the first year of collections.</p> <p>The extensive training/capacity building programme has been continued training high school and undergraduate students in fish ecology (concentrating on the ornamental species) and field techniques. A further three biologists have been trained and taken on as interns; one of the high school students from last year is now volunteering.</p> <p>The indicators are fine in the development of the survey protocols but do not indicate whether the monitoring protocol is being implemented.</p>
<p>Activity 1.1.1 Biological survey protocol approved by August 05.</p>	<p>Completed. Annual report 1</p>	
<p>1.1.2 Baseline fish surveys of the designated fishing zones completed and written up by June 06.</p>	<p>The baseline fish surveys have been completed in MSDR and ASDR. The surveys continue for the Lorricarid family.</p>	
<p>1.1.3: Results of the baseline biological surveys presented to the communities by June 06.</p>	<p>The results of the baseline surveys have been presented to and discussed with the communities of MSDR and ASDR.</p>	

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. The latest list is provided in Annex 6.1 and 6.2 but this will continue to be added to over subsequent years.
1.2.2: Biological monitoring protocol agreed and adopted by August 06.	Biological monitoring protocol has been developed and is being incorporated into the CAMP.
1.3.2: Supporting information for CAMP collected by project team by May 2006.	Supporting information for the CAMP has been collected. The biological information is incorporated as the findings emerge.
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. The CAMP is currently (April 08) being finalised for the fish collections planned in October 2008.
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. At least four new biologists have been trained this year.
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. The first collection will be October 2008.
1.4.3: This is to be repeated annually <i>ad finitum</i> .	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	2.1 Households that have elected to be involved in the project benefit from an increased income of 10%
	Household that have expressed an interest in the project have taken part in the workshops organised by the Project and 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

<p>knowledge and needs identified, and feedback loop established.</p> <p>[Increase livelihood opportunities from extraction of sustainable levels of ornamental fish lead to increased income for households in MSDR].</p>	<p>due to the new fishery by 2008.</p> <p>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.</p>	<p>surveys and business plans were conducted during the project.</p> <p>It is likely that the Community Association will be incorporated as a sub group to the established Fishery Association. They will be legalised in April 2008. The members of the Ornamental Fish Association have taken part in the training workshops conducted in 2007/08 in fish collection; community organising; fish welfare/husbandry; book keeping etc.</p>
<p>Activity</p> <p>2.1.1 Socioeconomic survey protocol agreed by September 05</p>		<p>Survey protocol completed and implemented. (See Annual Report 1)</p>
<p>2.1.2: Communities and individuals to be involved in the project determined and agreed by December 2005.</p>		<p>The socio economic surveys identified those communities who were interested in establishing an ornamental fishery. The communities interested are now part of the Fishing Association, which is about to be legalised (April 08).</p>
<p>2.1.3: Baseline socio-economic surveys of identified MSDM communities and fishers completed by May 2006.</p>		<p>The baseline socioeconomic surveys have been completed and 233 families were interviewed. See Annual Report 2.</p>
<p>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.</p>		<p>Socio economic monitoring protocol was developed and reviewed. The socio economic indicators were refined. See Annual Report 2.</p>
<p>2.2.1: Socio-economic survey team including community promoters trained in survey protocol by October 2005.</p>		<p>The socio economic team continue to work with the communities of MSDR and ASDR. The junior socio economist has now left to complete her Masters course and a replacement sociologist has been recruited and fully trained up in the survey protocol.</p>
<p>2.2.2: Results of the baseline socio-economic surveys presented to the communities by June 06.</p>		<p>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. See Annual</p>

		Report 2.
2.2.3: Through a process of consultation, communities endorse Best Practice Guidelines ¹ by September 2006.		The Best Practice Guidelines (BPG) has been presented to the communities through the workshops. A simple pictorial guide will work as a reference tool for the communities. An electronic copy is attached in Annex 5. A feedback session was held as part of the workshop and no alterations were required.
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 3-5.
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 were held June 2007. The associations will only be legalised when the activity has been initiated. It was decided that the best approach was to establish the ornamental fishing association as a sub-group of the wider fishing within the reserves. It is hoped that the associations will be legalized in April 2008.
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 was carried out in December 2007.
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.	<p>3.1 A sustainable trade in ornamental fish is established from the MSDR by May 2008.</p> <p>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.</p>	<p>The steps are being taking towards establishing a sustainable fishery. An exporter has been identified in Manaus and negotiations are currently being made.</p> <p>In 2007, OATA (Ornamental Aquarium Trade Association) guidance on industry standards on water quality was published, which was followed earlier this year by guidance on the transportation of ornamental species. We now intend to promote these guidelines as the industry standard, perhaps translating them and making them more accessible for the community traders.</p>

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 and 2.
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 Annual Report 2.
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. See Annual Report 2.
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.
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 drafted but industry standards have been produced in this past year. These will be adopted instead.
3.2.3: Peer review standardised Best Practice Guidelines are adopted by fishers, managers, communities, traders, exporters, importers and retailers by May 2008		See above.
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.

<p>Output 4 Fish welfare maintained from source to end user</p>	<p>4.1 Ornamental fish welfare secured by achieving 80% reduced mortality along the supply chain from 2008.</p>	<p>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. This will continue during the importation process by setting up receiving stations to monitor fish health during international transportation and acclimatisation.</p>
<p>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</p>		<p>Key areas for improvement identified during the research trip to Barcelos have been incorporated into the Best Practice Guidelines given to the fishing associations during the collection and fish handling workshops. Industry standards for water quality have now been published by OATA.</p>
<p>4.1.2 Best practice guidelines produced for animal welfare from capture to consumer by May 2007.</p>		<p>See Annual Report 2 and Annex 4-6 of this report. These best practice guidelines for animal welfare were part of a training programme for the communities. It is in the interest of the trade that all fish stay alive and healthy.</p>
<p>4.1.3 Communities, exporters and importers implementing Fish Welfare Best Practice guidelines by May 2008</p>		<p>The choice of exporter has been supported by welfare considerations – see Business Plan. The current negotiations with the chosen exporter include maintaining best possible conditions for the fish.</p>

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.