



## ***Darwin Initiative for the Survival of Species***

### ***Final Report***

Project title	Madagascar Marine Biodiversity Training
Country	Madagascar
Contractor	The Society for Environmental Exploration
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## 1. Project Background/Rationale

The project was based in the region of Anakao in south west Madagascar. The longest uninterrupted barrier reef in Madagascar is situated off this coastline and this along with the intertidal ecosystem is the location of a major artisanal fishery targeting a wide variety of marine fauna from crustaceans and molluscs to dolphins and turtles. The area also supports about 320,000 ha of mangroves. The region is also the location of the most recent catch in March 2001, of the most sought after living fossil, the coelacanth (*Latimera chalumnae*).

Threats to the marine environment in the area include localised resource degradation in particular of coral reefs and mangroves, through destructive and inefficient practices; the ecological impacts of fisheries, sedimentation and the erosion of inland watersheds. Over-fishing is becoming a serious problem in this area, influenced considerably by an increasing coastal population. The regions mangroves are intensively exploited for firewood, building materials, aqua-culture and livestock grazing and tourism is increasing rapidly in the area attracted by the reef-related activities. As recently as 1999 there was only one hotel in the project area, there are now seven hotels.

Many policy reports concerning the marine environment of Madagascar have recommended that coral reef surveys should be carried out to determine their status and that the establishment of marine parks should be seriously considered. Anakao has been identified as a high priority site for biodiversity protection and the development of eco-tourism.

The local marine research institute the Institute Halieutique et des Sciences Marines (IH.SM) has identified that a major lack of time and funds have been made available for the requirements of the marine and coastal component of the National Environmental Action Plan (PNAE), to achieve anything more than rapid surveys of a limited number of coastal sites. It is also recognised that there is a lack of funding provided for Malagasy students to conduct practical field projects in marine resource monitoring and assessment. Local fisheries officers also lack the capacity to undertake monitoring and protection of these marine resources. The only currently protected area in Anakao surrounds the island of Nosy Ve. Protection is in the form of a "dina" a community management project run by a local NGO FIMIMANO, however, this is not recognised or respected by anyone other than the local communities of Anakao. FIMIMANO is comprised of representatives of the six villages with interests in Nosy Ve however, these are ordinary village members and lack the basic skills and baseline information to develop a habitat management plan for the area.

## 2. Project Summary

### 2.1 Purpose

To create a core team of expertise with the necessary skills to collect marine baseline data, and to manage and monitor resources in the Anakao coastal region through implementation of a long-term monitoring plan.

### 2.2 Objectives

- To aid marine resource security by providing skills to monitor and manage marine biodiversity.
- To train 24 fisheries officers, community representatives and personnel/students of the

Institute of Oceanography and Marine Science (IH.SM) in sustainable resource use and marine biodiversity survey/monitoring methods.

- The trainees will form core team expertise, with the necessary skills to collect marine baseline data, and manage and monitor resources in the Anakao coastal region.
- To establish four permanent monitoring sites and to develop a long-term monitoring plan for the Anakao coastal region for inclusion in the National Environmental Action Plan (PNAE).

*Refer to the Logframe included in Annex A*

### **2.3 Operational Plan**

The project started in October 2001 and ran for 12 months as agreed by the Darwin Secretariat and explained in the April 2002 Annual report. The training schedule was re-arranged but met proposed objectives, refer to the Annual report 2002 for details and **Annexe C** for the specifics of the training activities, *Outcomes of a biodiversity training initiative: Madagascar marine biodiversity training project*.

### **2.4 Articles under the Convention of Biological Diversity**

The project covered aspects of different articles of the Convention for Biological Diversity, as follows:

**Article 7: Identification and monitoring:** More specifically, monitoring of components of biological diversity, and maintenance and organisation relevant data – these aspects were achieved through the production of a *Habitat Monitoring Plan Annexe D* and establishment of monitoring sites, by project trainees under the supervision and guidance of project staff.

**Article 8: In-situ Conservation:** promotion of habitat protection, protection of traditional lifestyles and knowledge on biological resources – these aspects were achieved firstly through the production of the habitat monitoring plan and secondly through supporting FIMMINANO, whose members manage the island of Nosy Ve and actively participated within the training programme.

**Article 12: Research and Training :** establish programmes for scientific and technical education in conservation and sustainable use of biological components, promote research contributing to conservation and sustainable use of biological diversity in developing countries – these aspects were achieved primarily as the project was based in Madagascar and project participants were Malagasy; training activities targeted participants across an educational range from those studying postgraduate qualifications to those with a primary education, specifics of the training can be found in the **Annexe C**; postgraduate students conducting personal scientific investigations and were involved in the production of the *Habitat Monitoring Plan Annexe D*.

**Article 13: Public Education and Awareness:** promote the understanding of the importance of measures to conserve biological diversity and propagate these measures through the media; cooperate with other states and organisations in developing awareness programmes – these aspects were achieved through project information dissemination at workshops (participation of partners, trainees, government bodies and related NGOs), radio and TV interviews, press releases and community liaison meetings, refer to **Annexe C** for details.

**Article 17: Exchange of information:** facilitate information exchange, including technical scientific research and information on training and surveying programmes and local knowledge – these aspects were achieved through project document information dissemination, posting of information on the Society website and contributing to the coral reef monitoring of Madagascar with the monitoring report, **Annexe D**.

## 2.5 Meeting objectives

The project was a great success and this is evident from the feedback received during the workshops and final seminar and trainee feedback. The project met the original proposed purpose and objectives. The training for the fisheries officers and local community representatives unfortunately had to be reduced as trainees could not afford to leave their home/ work for the period of time (8 weeks) that the project had proposed. This was an oversight and not anticipated, however the postgraduate students were able to attend training activities and conduct survey for the period of time proposed (8 week). Students were in a position to attend for a longer period of time due to having less commitments in comparison to the fisheries officers or community representatives. *Refer to Annexes B, C, D for details.*

## 3. Scientific, Training, and Technical Assessment

### 3.1 Training

Training targeted three main groups, community representatives, fisheries officers and postgraduate students. **Annexe C** describes the training activities and information dissemination, and **Annexe B** provides an outline of the topics covered during the training, *Marine biodiversity training manual*.

Students under the guidance of project staff conducted research activities after the 5 week training period. The group aided the production of a *Habitat Monitoring Plan* **Annexe D** and carried out individual investigation during their training.

Trainees, training periods and trainee target group are summarised in Table 1. Additional trainees from the community representative target group participated in the training. An additional 4 personnel were trained. This additional training occurred because there was the need and interest within the community and the project could facilitate them within the project capacity.

### 3.2 Trainee selection

#### 3.2.1 Community representatives

Frontier-Madagascar has been working closely with FI.MI.MA.NO since 2000, organising village presentations, helping maintain marker buoys for the no-take zone (the 'Aquarium') and offering advice on the environment. Considering the role of this association in the management of the area, the president's advice was sought with regards to the choice of trainees. Thus, trainees included key representatives of FI.MI.MA.NO: the president, the treasurer, the secretary and the vice-president, the president of Anakao-bas and fishermen well respected within their community.

This selection aimed at making sure the messages would be passed on to at least a fair section of the village inhabitants. A traditional Malagasy way to communicate information is through informal discussions once the fishing day is over, whilst sitting under a tamarind tree with other villagers or gossiping in family quarters, around the well or at the local bar. Choosing these respected people was a means to insure that knowledge would be past on to a maximum number of beneficiaries as word of truth.

For further detail refer to **Annexe C** section 2.1

**Table 1: Trainees, training period and target group.**

Number	Name	Training period	Training type
1	MARTIAL Didi	Oct 01 – Mar 02	IHSM student
2	TATANGIRAFENO Sebastien	Oct 01 – Mar 02	IHSM student
3	RABERINARY Daniel	Oct 01 – Mar 02	IHSM student
4	MEDOR Patrick Alexis	Jan – Mar 02	community representatives
5	GUIFFANT Jean Filison	Jan – Mar 02	community representatives
6	DEZA Bernard	Jan – Mar 02	community representatives
7	DEGORGE Honoré	Jan – Mar 02	community representatives
8	Flarisène	Jan – Mar 02	community representatives
9	RAKOTOJAONA Vahatra Zo Nomenjanahany	Apr – June 02	IHSM student
10	RALISAONA Bartali Léandro	Apr – June 02	IHSM student
11	Roger	Apr – June 02	IHSM student
12	Félix Raolake	Apr – June 02	community representatives
13	Itoh Pentekoste	Apr – June 02	community representatives
14	Michel Jean Fleury	Apr – June 02	community representatives
15	Clément Désiré	Apr – June 02	community representatives
16	Charles dit Vani	Apr – June 02	community representatives
17	Jean	Apr – June 02	community representatives
18	MANOELY	Apr – June 02	fishery officer
19	RAZAFINDAMANANA Julienne	Apr – June 02	fishery officer
20	NOELY	Apr – June 02	fishery officer
21	RAFARAMAMDIMBY Salvador Calvin	Apr – June 02	fishery officer
22	LIVINY Etsiavitra Augustine	Apr – June 02	fishery officer
23	RASOAMAMAHIRANA R. Céline	Apr – June 02	fishery officer
24	VAOARIMANANA Célestine	July – Sept 02	IHSM student
25	RASOAMANENDRIKA Faravavy Marie Agrippine	023 July – Sept 02	IHSM student
26	ABOUD Amina	023 July – Sept 02	IHSM student
27	RAKOTONDRA SOA Ananias	023 July – Sept 02	IHSM student
28	RAFAELIARISOA Claudine	023 July – Sept 02	IHSM student
29	ZAFIHITA Gaspariel	023 July – Sept 02	IHSM student

Training activities were conducted by target group as the activities and content were adapted according to the target group, their background knowledge and education level. Table 2 summarises the training topics covered during the project, these are expanded in to *Marine biodiversity training manual, Annexe B*.

**Table 2: Summary of topics covered during training**

	<b>Core subjects</b>
1	Ecology of tropical coastal ecosystems
2	Threats on tropical coastal ecosystems
3	Sustainable resource management
4	Survey and monitoring techniques
5	Personal project

**Specialised training for trainee type**

	<b>Topic/subject</b>
<b>Students</b>	Coral reef ecology
	Reef fish ecology
	Seagrass bed ecology
	Mangrove ecology
	Interactions between ecosystems
	Ecology and biology of turtles, sharks and cetaceans
	Survey and monitoring techniques
	Threads on mangroves
	Threads on seagrass bed and coral reef
	Catch and how to assess its sustainable yield
	Environmental impacts of fisheries
	Threads on biodiversity
	Biodiversity management
	Fisheries management
	Marine and coastal zone management
	The use of remote sensing and GIS for coastal manager
	Practical exercises
Personal project	
Swimming/Snorkelling training	

<b>Fisheries officers</b>	Ecology of coral reef, seagrass and mangrove
	Interactions between ecosystems
	Ecology of turtle, shark, cetaceans
	Human activities impacts on marine and coastal ecosystems
	Fishery impacts on marine environment
	Marine pollution
	Destructive fishing techniques and aquaculture
	Catch and how to assess stocks
	Fisheries management
	Coastal zone management
	International, national and regional politics
	Public awareness raising strategies
<b>Community representatives</b>	Biology of marine and coastal ecosystems 1 (seagrass ,mangroves, coral reefs)
	Biology of marine and coastal ecosystems 2 (turtles, sharks and cetaceans ecology)
	Threats to marine and coastal ecosystems
	Sustainable resource use management
	Snorkel training

### 3.2.2 Fisheries Officers

The Director of the Fisheries and Marine Resources Branch selected the trainees based on whom the training would most benefit in order to improve the team's work objectives and results for the branch. Although he would have liked to participate himself, he was ultimately unable to attend. However, representatives of all units took part.

For further detail refer to **Annexe C** section 2.2

### 3.2.3 Students

Three groups of IH.SM students took part in the training programme, a total of 12 trainees. The IH.SM Director selected the first group of trainees. Thereafter the Darwin Initiative Training Project became famous amongst students and selecting the candidates occurred through an interview process. The interviews were conducted in order to perceive the level of motivation of potential trainees and whether the training was relevant with regard to their career plans.

The questionnaire lasted about 15 minutes and included the following questions:

Which course are you on? What year?

Are there still some lectures that you need to be taught at University for your course this term?

Which part of the course is your favourite?

What do you aim to do in the short term? The long term? (career wise)

Why do you want to take part in the Darwin Initiative training programme?

Can you swim?

For further detail refer to **Annexe C** section 2.3

## 3.3 Research

### 3.3.1 Student investigations

The research activities conducted during the project involved student trainees planning and implementing scientific investigations and the formation and implementation of habitat monitoring. A selection of the reports can be found on the accompanying information CD. The investigations conducted by the students were as follows:

<b>Name</b>	<b>Title of Personal Project in French (explanatory title provided in English)</b>
Mr. MARTIAL Didi	<b>Evaluation de l'utilisation de la senne de plage et de ses impacts dans les villages d'Anakao et de Soalara</b> <i>Assessment of the use of beach seine nets in Anakao and Soalara with recommendations for monitoring and management</i>
Mr. TATANGIRAFENO Sébastien	<b>Evaluation de la pêche aux poissons et de ses impacts socio-économiques dans le village d'Anakao</b> <i>A socio-economic study of coastal and marine resource use in Beheloka: with recommendations for management</i>
Mr. RABERINARY Daniel	<b>Evaluation de l'exploitation des céphalopodes de Beheloka</b> <i>Assessment of the cephalopod fishery of Beheloka: a basis for monitoring and management</i>



Mr. RALISAONA Bartali Léandro	<b>Evaluation de la pêche à pied traditionnelle entre Anakao et Ampasipoty</b> <i>Establishment of a monitoring process for lagoon gleaning activities between Ampasipoty and Anakao: a basis for monitoring and management</i>
Mr. Roger	<b>Evaluation de la pêche aux poissons et de ses impacts socio-économiques dans le village d' Anakao</b> <i>Assessment of fish exploitation and its potential socio-economic impacts in the village of Anakao : a basis for monitoring and management</i>
Miss. VAOARIMANANA Céléstine Mr. RAKOTOJAONA Vahatra Zo Nomenjanahany	<b>Mise en place d'un centre d'information destiné à sensibiliser la population sur l'utilisation durable des ressources naturelles, avec un suivi des perceptions locales</b> <i>The establishment of an information centre aiming at raising public awareness on sustainable marine resource use, with a local perception monitoring process</i>
Miss. RASOAMANENDRIKA Faravavy Marie Agrippine	<b>La pêche à la crevette et ses impacts socio-économiques à Lovokampy</b> <i>Assessment of the shrimp fishery of Lovokampy with recommendations for management</i>
Miss. ABOUD Amina	<b>Identification et exploitation des différents espèces de crabes de mangrove dans la région de Lovokampy</b> <i>A study of the mangrove crabs of Lovokampy as a basis for monitoring and management</i>
Mr. RAKOTONDRA SOA Ananias Ms. RAFAELIARISOA Claudine Mr. ZAFIHITA Gaspariel	<b>Selection et mise en place d'un plan de suivi des récifs coralliens dans la région d'Anakao : une contribution à l'initiative nationale de suivi des récifs</b> <i>Selection and establishment of coral reef habitat monitoring sites in the Anakao region as part of the National Coral Reef Monitoring Initiative</i>

### 3.3.2 Habitat Monitoring Plan

The habitat monitoring was concerned with coral reefs and followed methodology used in other parts of Madagascar to feed into the national information base. Three monitoring sites were established and these are now permanent locations for future coral reef monitoring in Anakao.

The monitoring technique used was based on the Plan Régional Environnement – Commission d’Ocean Indienne (Regional Environment Plan Indian Ocean Commission) - PRE/COI methodology which was adapted from the Global Coral Reef Monitoring Network (GCRMN).

The first step in the establishment of monitoring sites was to undertake snorkelling surveys. Effectively, this was an overall exploration of the reef sector based on visual observations. It was conducted on a site comprising 2 stations: 1 on the reef flat and 1 on the reef slope. This enabled a precise choice of the location of stations after an overall assessment of coral communities. Other significant trends in the sector were recorded such as large-scale destruction, *Acanthaster planci* outbreak, signs of pollution and coral bleaching.

For details of methodology and results please refer to the *Darwin Initiative Habitat Monitoring Plan: coral reef monitoring in south-west Madagascar, Annexe D*.

## **4. Project Impacts**

### **4.1 Evidence and achievements**

Evidence of achieving the project purpose can be seen from the accompanying annexes of this document notably B, C, D,E,F, G and H with regard to trainees, training activities, a production of a monitoring plan, outcome of regular workshops and the photographs of some of the events and information dissemination.

The project has build capacity within the region of representatives of the three target groups, and has help work towards 5 articles of the CBD as section 2.4. Article 12 has been achieved within the remit of the project in terms of the training and research conducted. More specifically the training of students provided them with the practical experience, not currently available through University graduate or postgraduate degrees. The scientific investigations were not of peer review standard, but are examples of necessary building blocks which are essential for future sustainable management of the natural resources.

Trainees from fisheries and community target groups are continuing with their work objectives as previously but now with increased background knowledge and appreciation of alternative actions and sustainable management. Community representatives from FIMIMANO continue to manage the “no-take” zone of Nosy Ve and now have a knowledge with regard to trophic levels, species composition, coral health, predator-prey relationships and have a better understanding of why it is important to continue protecting/ restricting areas for sustainable future management.

Students remain in the area with the majority continuing with their university studies, an example being fulfilling year 5 and 6 reading Applied Oceanography at The Institute of Marine Sciences ate the University of Toliara.

The training project served to increase links between Frontier-Madagascar and all target groups. The workshop structure proved a good forum for bringing representatives of the three target groups together. The relationship with the project partner was strengthened and this continues to be good between the Society and IH.SM, our Memorandum still be active conducting baseline survey work in the region funded through volunteer contributions, the core funding of the Society.

### **4.2 Local profile**

Local people are aware of some of the problems but may not know the reasons behind environmental degradation and the consequences of their living and working practices and where they are aware they do not know what potential solutions exist to improve the situation. Therefore, training is part of the answer to empowering key people within the local communities with the necessary knowledge so that they can play a role in biodiversity protection and in the management of the marine environment.

The Society has been working closely with the local communities through the research programme, thus explaining the training project to them was not difficult. The approach was different as the training project involved trainees staying at the research camp and participating in the daily activities. All trainees received a warm welcome and when trainees return to their home villages they have acted as positive critics. Indeed, we heard that they relayed positive accounts of their stay with the project to other villagers and share their newly acquired knowledge of the marine environment (particularly as Malagasy people tend to be great gossips).

Efforts have also been made to promote the work of the training programme in the wider region and to attract the attention of local people. At the end of the training periods, feedback workshops were organised at a different locations within the local vicinity, where a wide range of key figures from IH.SM, the University of Toliara various other governmental organisations and from the media were invited. The workshops were extremely successful and helped significantly to promote the project and disseminate positive environmental messages, for further details refer to **Annexe C**.

## **5. Project Outputs**

Outputs were achieved as proposed, in terms of training people for certain target groups, producing a local coral reef monitoring plan, to contribute to national efforts and the production of training reports, Manual and Outcomes, which will be useful tools for project expansion and related future projects. In addition newsletters were produced and disseminated, versions in English are in **Annexes F** and **G**.

An outcome of the project was the involvement of the student trainees with environmental education activities and more specifically with regard to turtle conservation efforts. A paper was presented at Reef Conservation UK conference in December 2002. The abstract will be published in the Reef Conservation conference proceedings, refer to **Annexe H**. In addition a poster was presented at the vent giving an overview of the training project activities and achievements.

A paper has been drafted with regard to the success and lessons learnt from the training of the three target groups. It is aimed that this will be submitted to an education journal this year. This will be done through the Society protocol.

Output dissemination is achieved through report distribution, articles (example article hard copy) and newsletters through the project life time. Information is posted on the Society website, and available for download. Reports are distributed in country and deposited at relevant libraries and an email list developed to raise awareness of the relevant web page.

The reports Annexes B, C and D are included as part of the *Frontier-Madagascar Environmental Research* report series ISSN: 1479-120X.

## **6. Project Expenditure**

***Table 3: Project expenditure during the reporting period***

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## 7. Project Operation and Partnerships

**The Institute Halieutique et des Sciences Marines (IH.SM)** IH.SM is the main project partner to the Society for Environmental Exploration and has been since the Society began work in Madagascar in January 2000. This relationship has gone from strength to strength and the success of the training programme so far has further cemented this relationship. Before the Darwin Initiative training project only a few postgraduate students from IH.SM were able to visit the research project. This was for very short periods as funds were not available to provide them with training in the research techniques. Thus the training project has been extremely well received and the Directors of IH.SM have asked if it will be possible to train more of their students. In particular they are interested in training in full SCUBA techniques and in the BTEC qualification in *Tropical Habitat Conservation* that the Society currently awards to international trainees on 10-week field courses. The Society is very keen to pursue this and will work together with IH.SM to secure longer-term funding to expand the training course.

**FIMIMANO** The local NGO FIMIMANO who voluntarily manage a small community based marine reserve around the island of Nosy Ve have collaborated with the Society since the start of the research programme. The research programme undertook biodiversity surveys within the Nosy Ve reserve and helped to produce information about the marine resources in the reserve in the form of notice boards and posters for visitors to the island. Through the training programme this relationship has also strengthened, not only through the provision of training to representatives from FIMIMANO but the habitat monitoring plan that will be developed. Currently the dina (community management) of Nosy Ve is respected only by local communities, fisherfolk and tourists from outside of the area do not respect its status and are under no legal obligation to do so.

**Collaboration and Links** The success of the project has spread among other NGOs and the project team were approached by the Wildlife Conservation Society (WCS) who have expressed an interest in organising a similar style training programme for their Malagasy employees. Based on the success of the training project the Society has also been approached by the University of Toliara to assist with the practical elements of a postgraduate course in Biodiversity and Environment within the natural Sciences Department of the University.

## 8. Monitoring and Evaluation, Lesson learning

Project monitoring was achieved through regular quarterly reporting, providing up dates of trainee selection, course progress, workshop planning and habitat monitoring site selections. In addition to quarterly reporting the Project Co-ordinator liaised with the Directors of IH.SM on a regular basis with regard to training progress.

Internal evaluation was achieved through the quarterly reporting of project achievements and expenditure against the proposal and work plans. An external evaluation was not conducted as the project ran for 12 months only and did not budget for this expense, since partner relationships already existed and liaison and collaboration was good. Evaluation was assessed via various components of the training such as:

**Trainee scientific investigations** The main tool used to monitor the learning progress of the student trainees was the implementation of scientific investigations by trainees and the production of reports from these investigations see accompanying CD. In undertaking this independent study the trainees had the opportunity to demonstrate skills they learnt through the project. Therefore these are a direct indicator of the success of the student training. It was decided not to use this process with the community representatives and fisheries officers as it was considered beyond their capabilities and requirements.

**Feedback questionnaires** A second tool, used by trainees, was the completion of a feedback questionnaire at the end of each training course. These enable trainees to identify areas that were most and least useful, easy and difficult activities and areas where they would like to have received more training. Please refer to the appendices of **Annexe C**.

**Workshops** Feedback workshops at the end of each training phase were an opportunity for collaborating organisations (fisheries department, IHSM, ONE) to see and hear what the trainees had learnt and to provide third party assessment of the project progress and value.

**Final Workshop** A final presentation was made upon completion of the project at a final workshop. Refer to **Annexe C** for details.

## 9. Darwin Identity

The Darwin Initiative was promoted throughout the life of the project and continues through the publications of reports within *the Frontier Madagascar Environmental Research* report series. As can be seen from the photographs, the centre was and still is named the Darwin Initiative training centre. The newsletters and reports bare the Darwin Initiative logo and where given at radios and television interviews. Trainees received certification of their training which displayed the Darwin Initiative logo, refer to appendices of **Annexe C** and **Annexe E** for photographs

The training project was recognised as a distinct project though implemented under the umbrella of Frontier-Madagascar, providing logistical, operational and technical support and managed by the Society in collaboration with counterparts IH.SM.

## 10. Leverage

During the project, the Society continued providing support as proposed to aid the facilitation of the training opportunities. Based on the success of the training project the Society was approached by the University of Toliara which has developed a postgraduate course in Biodiversity and Environment within the natural Sciences Department of the University. The University are integrating students of the course into the Society's Forest Research Programme, active in south west Madagascar since June 2001, to provide them with practical field research experience. The costs for the student training is being met via a variety of ways, through WWF dry forest programme and collaborating institutions which have particular interest in certain taxa, for example Field Museum, Chicago covers costs for student participation concentrating on mammals. However this training is sporadic due to irregular funding.

## 11. Sustainability and Legacy

The training of 29 individuals are the legacy of the project in Madagascar, particularly as information travels quickly by word of mouth and the project targeted three different groups to cover a spectrum of education level. The relationship between IH.SM and the Society continues, as the biodiversity survey work continues in marine and terrestrial environments at a basic level. The experiences of the training are outlined in **Annexe C** Report 4 of the Frontier Madagascar Environmental Research, training topics and contents are covered in Report 3, **Annexe B** the training manual and the coral reef habitat plan for the region is described in Report 6, **Annexe D**. These reports also serve part of the legacy as they are distributed and deposited and part of an ISSN series. The outcomes of the project were highlighted at two Darwin Initiative events during 2002. A poster and a paper were presented at the Reef Conservation UK 2002 Conference in December.

The training project maintained a good reputation for the duration in country. The Society would like to develop the training project further and will be submitting to the Darwin Initiative for post

project funding as invited, with a view of investigating in-country funds to continue the activities in the long term from the corporate world.

## **12. Post-Project Follow up Activities** (max. 300 words)

Project personnel were approached by several organisations interested in developing similar training programmes for both Malagasy students and employees of Malagasy organisations. The project was requested by the partners IH.SM to further develop the programme and if students from COUT (Cellule Océanographique de l'University de Tuléar) could also be involved in the project.

Furthermore, feedback forms completed by the trainees revealed that they were particularly interested in learning more information about various subjects, whether completely new or not. Their thirst for knowledge was definitely heightened by the training. This has extended to other students and many would like to sign on for the training in order to learn more about biodiversity management.

There is therefore a great deal of scope for further developing, expanding and replicating the project in the following ways:

- Development of the marine biodiversity training to include SCUBA training and a 10 week Btec course, *Advanced Diploma: Tropical Habitat Conservation* (a Society run course).
- Development of a programme to train trainers from farther afield in order to facilitate replication of the training programme within other educational and training establishments in the region and potentially throughout Madagascar.
- Development of training programmes for employees of NGOs and other conservation biodiversity organisations working in the region and potentially throughout Madagascar.

The Marine Biodiversity Training project was developed to meet some of the capacity building needs in the region of Anakao. Working with local departments has set an example which can be replicated in other areas of Madagascar, that is, steps forward for empowering local communities to monitor and manage their own natural resources.

## **13. Value for money**

The project was very good value for money with the resultant outcomes and outputs: low tech training centre built from local capacity; capacity building of a Malagasy trainer; successful training of 12 postgraduate students, 6 fisheries officers, 11 community representatives; production of training materials resulting in the publication of three technical reports 4,5,6 of Frontier Madagascar Environmental Research series and the implementation of a coral reef monitoring plan with the designation of 3 permanent sites. Relationships in country were developed for the good of future training in the region with the potential to expand in other parts of Madagascar to use the experiences and formats from this training as a blue print. The interest in Madagascar for future training, building from this project is high both from the point of view potential trainees and from institutions and NGOs that require capacity building via personnel training.

### **Author(s) / Date**

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The Society for Environmental Exploration

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

<b>Project Contribution to Articles under the Convention on Biological Diversity</b>		
<b>Article No./Title</b>	<b>Project %</b>	<b>Article Description</b>
<b>6. General Measures for Conservation &amp; Sustainable Use</b>		Develop national strategies which integrate conservation and sustainable use.
<b>7. Identification and Monitoring</b>	5 %	Identify and monitor components of biological diversity, particularly those requiring urgent conservation; identify processes and activities which have adverse effects; maintain and organise relevant data.
<b>8. In-situ Conservation</b>	5 %	Establish systems of protected areas with guidelines for selection and management; regulate biological resources, promote protection of habitats; manage areas adjacent to protected areas; restore degraded ecosystems and recovery of threatened species; control risks associated with organisms modified by biotechnology; control spread of alien species; ensure compatibility between sustainable use of resources and their conservation; protect traditional lifestyles and knowledge on biological resources.
<b>9. Ex-situ Conservation</b>		Adopt ex-situ measures to conserve and research components of biological diversity, preferably in country of origin; facilitate recovery of threatened species; regulate and manage collection of biological resources.
<b>10. Sustainable Use of Components of Biological Diversity</b>		Integrate conservation and sustainable use in national decisions; protect sustainable customary uses; support local populations to implement remedial actions; encourage co-operation between governments and the private sector.
<b>11. Incentive Measures</b>		Establish economically and socially sound incentives to conserve and promote sustainable use of biological diversity.
<b>12. Research and Training</b>	70 %	Establish programmes for scientific and technical education in identification, conservation and sustainable use of biodiversity components; promote research contributing to the conservation and sustainable use of biological diversity, particularly in developing countries (in accordance with SBSTTA recommendations).
<b>13. Public Education and Awareness</b>	15 %	Promote understanding of the importance of measures to conserve biological diversity and propagate these measures through the media; cooperate with other states and organisations in developing awareness programmes.
<b>14. Impact Assessment and Minimizing Adverse Impacts</b>		Introduce EIAs of appropriate projects and allow public participation; take into account environmental consequences of policies; exchange information on impacts beyond State boundaries and work to reduce hazards; promote emergency responses to hazards; examine mechanisms for re-dress of international damage.
<b>15. Access to Genetic Resources</b>		Whilst governments control access to their genetic resources they should also facilitate access of environmentally sound uses on mutually agreed terms; scientific research based on a country's genetic resources should ensure sharing in a fair and equitable way of results and benefits.

<b>16. Access to and Transfer of Technology</b>		Countries shall ensure access to technologies relevant to conservation and sustainable use of biodiversity under fair and most favourable terms to the source countries (subject to patents and intellectual property rights) and ensure the private sector facilitates such assess and joint development of technologies.
<b>17. Exchange of Information</b>	5 %	Countries shall facilitate information exchange and repatriation including technical scientific and socio-economic research, information on training and surveying programmes and local knowledge
<b>19. Bio-safety Protocol</b>		Countries shall take legislative, administrative or policy measures to provide for the effective participation in biotechnological research activities and to ensure all practicable measures to promote and advance priority access on a fair and equitable basis, especially where they provide the genetic resources for such research.
<b>Total %</b>	<b>100%</b>	<b>Check % = total 100</b>



## 14. Appendix II: Outputs

Code	Total to date (reduce box)	Detail
<b>Training Outputs</b>		
1a	Number of people to submit PhD thesis	
1b	Number of PhD qualifications obtained	
2	Number of Masters qualifications obtained	
3	Number of other qualifications obtained	
4a	Number of undergraduate students receiving training	
4b	Number of training weeks provided to undergraduate students	
<b>4c</b>	<b>Number of postgraduate students receiving training (not 1-3 above)</b>	<b>12 students from IH.SM</b>
<b>4d</b>	<b>Number of training weeks for postgraduate students</b>	<b>96 weeks (8 weeks x 12 students)</b>
<b>5</b>	<b>Number of people receiving other forms of long-term (&gt;1yr) training not leading to formal qualification( i.e not categories 1-4 above)</b>	<b>1 person Malagasy Trainer</b>
<b>6a</b>	<b>Number of people receiving other forms of short-term education/training (i.e not categories 1-5 above)</b>	<b>17 people Fisheries officers (6) and community representatives (11)</b>
<b>6b</b>	<b>Number of training weeks not leading to formal qualification</b>	<b>34 weeks (2 weeks x 17 trainees)</b>
<b>7</b>	<b>Number of types of training materials produced for use by host country(s)</b>	<b>3 reports Training Manual, Habitat Monitoring plan, Outcomes of biodiversity training</b>
<b>Research Outputs</b>		
<b>8</b>	<b>Number of weeks spent by UK project staff on project work in host country(s)</b>	<b>104 weeks duration of the project</b>
<b>9</b>	<b>Number of species/habitat management plans (or action plans) produced for Governments, public authorities or other implementing agencies in the host country (s)</b>	<b>1 habitat plan Habitat Monitoring Plan: coral reef monitoring in south-west Madagascar</b>
10	Number of formal documents produced to assist work related to species identification, classification and recording.	
11a	Number of papers published or accepted for publication in peer reviewed journals	
<b>11b</b>	<b>Number of papers published or accepted for publication elsewhere</b>	<b>1 Paper produced: abstract to be published in proceedings Paper submission pending</b>
12a	Number of computer-based databases established (containing species/generic information) and handed over to host country	
<b>12B</b>	Number of computer-based databases enhanced (containing species/genetic information) and handed over to host country	
13a	Number of species reference collections established and handed over to host country(s)	

<b>Code</b>	<b>Total to date (reduce box)</b>	<b>Detail</b>
13b	Number of species reference collections enhanced and handed over to host country(s)	
<b>Dissemination Outputs</b>		
<b>14a</b>	<b>Number of conferences/seminars/workshops organised to present/disseminate findings from Darwin project work</b>	<b>Total of 4 3 end of training workshops and an end of project seminar</b>
<b>14b</b>	<b>Number of conferences/seminars/ workshops attended at which findings from Darwin project work will be presented/ disseminated.</b>	<b>1 Reef Check UK conference December 2002. Paper presented and Poster displayed</b>
15a	Number of national press releases or publicity articles in host country(s)	
15b	Number of local press releases or publicity articles in host country(s)	
<b>15c</b>	<b>Number of national press releases or publicity articles in UK</b>	<b>2</b>
15d	Number of local press releases or publicity articles in UK	
<b>16a</b>	<b>Number of issues of newsletters produced in the host country(s)</b>	<b>2</b>
16b	Estimated circulation of each newsletter in the host country(s)	
16c	Estimated circulation of each newsletter in the UK	
17a	Number of dissemination networks established	
<b>17b</b>	<b>Number of dissemination networks enhanced or extended</b>	<b>1 IHSM forum additional participants/ members</b>
18a	Number of national TV programmes/features in host country(s)	
18b	Number of national TV programme/features in the UK	
<b>18c</b>	<b>Number of local TV programme/features in host country</b>	<b>2</b>
18d	Number of local TV programme features in the UK	
<b>19a</b>	<b>Number of national radio interviews/features in host country(s)</b>	<b>2</b>
19b	Number of national radio interviews/features in the UK	
<b>19c</b>	<b>Number of local radio interviews/features in host country (s)</b>	<b>1</b>
19d	Number of local radio interviews/features in the UK	
<b>Physical Outputs</b>		
<b>20</b>	<b>Estimated value (£s) of physical assets handed over to host country(s)</b>	<b>£2,570 Equipment: mask/ fins/ snorkel/ watch for each trainee, training materials and reference books</b>

<b>Code</b>	<b>Total to date (reduce box)</b>	<b>Detail</b>
<b>21</b>	<b>Number of permanent educational/training/research facilities or organisation established</b>	<b>1 Training centre Currently maintained by Frontier-Madagascar, available for further activities funding dependent</b>
<b>22</b>	<b>Number of permanent field plots established</b>	<b>4 Described in Habitat Monitoring Plan</b>
<b>23</b>	<b>Value of additional resources raised for project</b>	<b>Matched funding - £24,900: Society in the form of equipment  In kind support - £80,000 from the Frontier-Madagascar Marine Research Programme  In kind support - £16,260 from project partners IH.SM in terms of facilities</b>

## 15. Appendix III: Publications

Provide full details of all publications and material that can be publicly accessed, e.g. title, name of publisher, contact details, cost. Details will be recorded on the Darwin Monitoring Website Publications Database that is currently being compiled.

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

<b>Type *</b> (e.g. journals, manual, CDs)	<b>Detail</b> <b>(TITLE, AUTHOR, YEAR)</b>	<b>Publishers</b> <b>(NAME, CITY)</b>	<b>Available from</b> (e.g. contact address, website)	<b>Cost £</b>
*Manual	Frontier Madagascar (2003) Marine biodiversity training manual	Frontier-Madagascar Environmental Research Society for Environmental Exploration, London	50-52 Rivington Street, London EC2A 3QP	£6
*Monitoring plan	Frontier Madagascar (2003) Habitat monitoring plan	Frontier-Madagascar Environmental Research Society for Environmental Exploration, London	50-52 Rivington Street, London EC2A 3QP	£6
*Report	Frontier Madagascar (2003) Outcomes of biodiversity training initiatives	Frontier-Madagascar Environmental Research Society for Environmental Exploration, London	50-52 Rivington Street, London EC2A 3QP	£6

## 16. Appendix IV: Darwin Contacts

To assist us with future evaluation work and feedback on your report , please provide contact details below.

<b>Project Title</b>	Madagascar Marine Biodiversity Training project
<b>Ref. No.</b>	<b>162/10/021</b>
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