



**MAURITIUS RESEARCH COUNCIL**

**INFORMATION SYSTEMS FOR OPTIMIZED  
DATA MANAGEMENT TO INCREASE THE  
EFFICACY OF BIODIVERSITY  
CONSERVATION EFFORTS IN MAURITIUS  
AND RODRIGUES**

**Final Report**

**MAURITIUS RESEARCH COUNCIL**

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**THE MAURITIAN WILDLIFE FOUNDATION**  
**Report to the Mauritius Research Council**

**FINAL REPORT**

**Information systems for optimised data management to increase the efficacy of biodiversity conservation efforts in Mauritius and Rodrigues (MRC –RUN 0018)**

**Introduction**

The above Mauritius Research Council funded project has been implemented by the Mauritian Wildlife Foundation (MWF). The major focus of the project was the creation and management of fauna (endemic birds, seabird and reptiles), flora (rare plants) and support structure (nursery) databases. Several databases have been designed under the present project namely the Round Island Petrel, Nursery and Round Island Boa databases, whilst others were restructured and reinforced e.g. Pink Pigeon, Echo Parakeet, Mauritius Kestrel and Rare Plants.

Recognizing the need to promote conservation education and awareness, education workshops and the production of field guides constituted the second axis of the project.

**Achievements**

*Pink Pigeon Database (PPDB 2.0)*

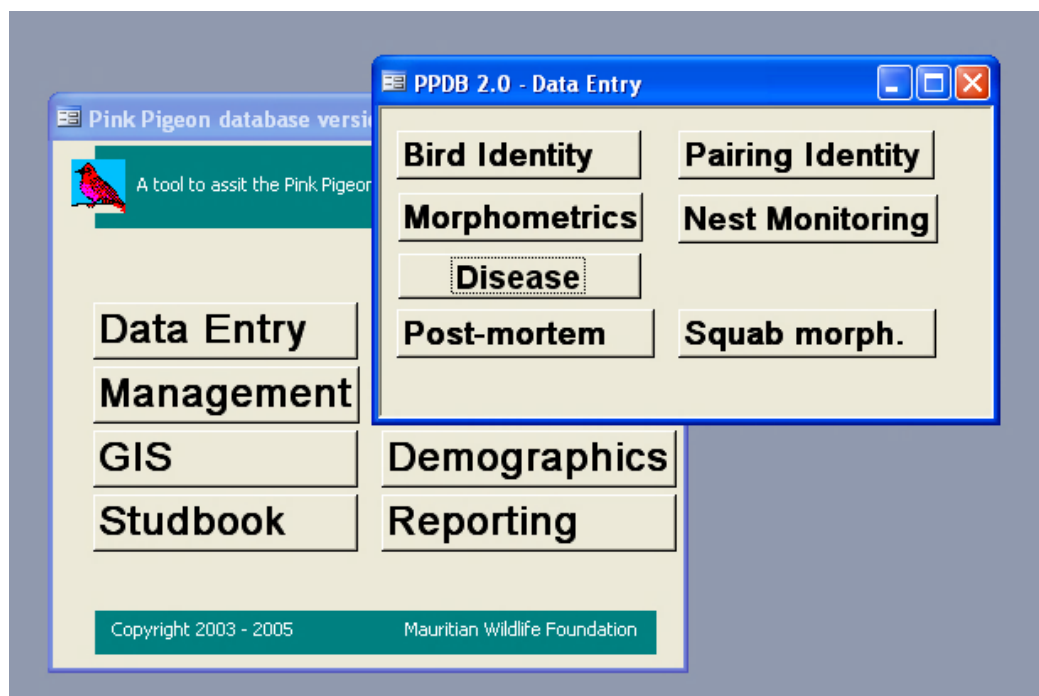
The PPDB 2.0 (Figure 1) is a comprehensive dataset on the biology and management of the Mauritius Pink Pigeon (*Nesoenas mayeri*) covering bird identity, pairing, nesting, adult and squab morphometrics, disease, post mortem and necropsy which have been designed to reorganise the data collected in the field.

The bird identity provides ringing data (metal ID and colour rings), parentage and hatching/fledging. The morphometric data includes weight of the bird and a range of measurement (wing, tarsus, bill, tail length) etc.

The disease sheet records information about the condition of the bird as well as the number of blood and other samples taken for analysis.

The post mortem field contains the facts and circumstances concerning the death of the focal bird. The pairing sheet documents the identities of the breeding birds and the nesting sheets give information about the outcome (success or failure) of nests of each breeding pair. The outcomes from the nest sheet give an idea of the stages at which the nests have been found such as nest building (NB) stage, egg laying and incubation stage and along with the final result.

The monitoring of squabs is done through the squab sheets recording information on the age, diet and health of the birds.





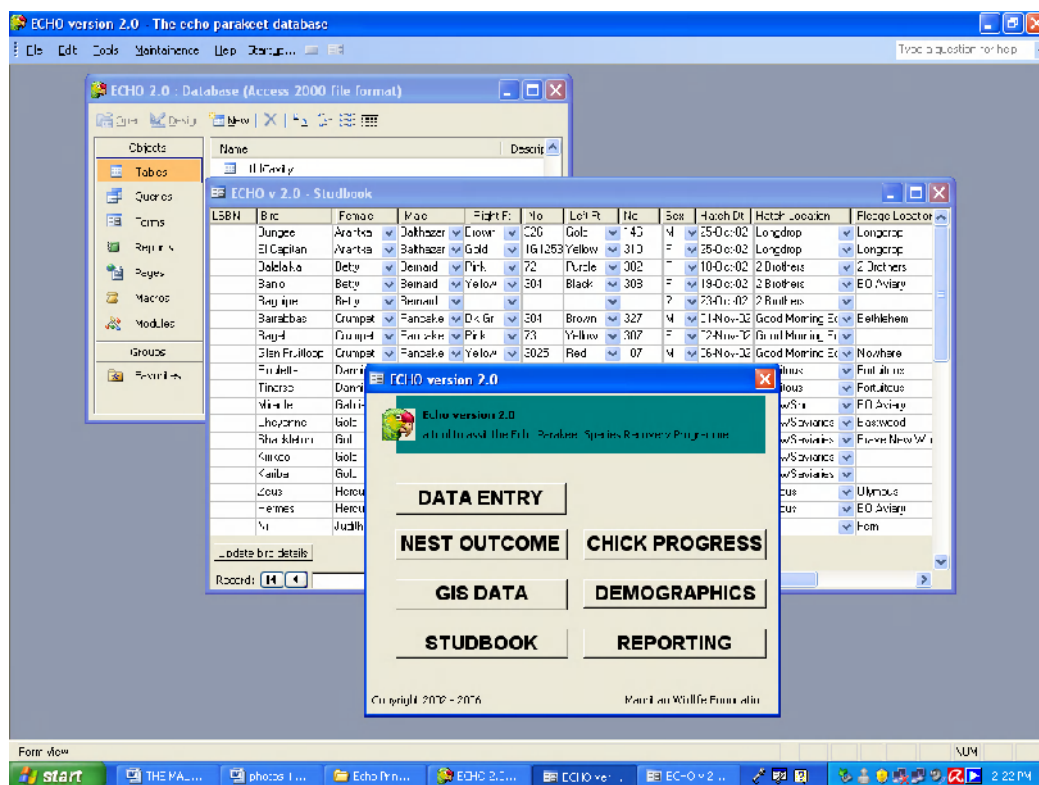
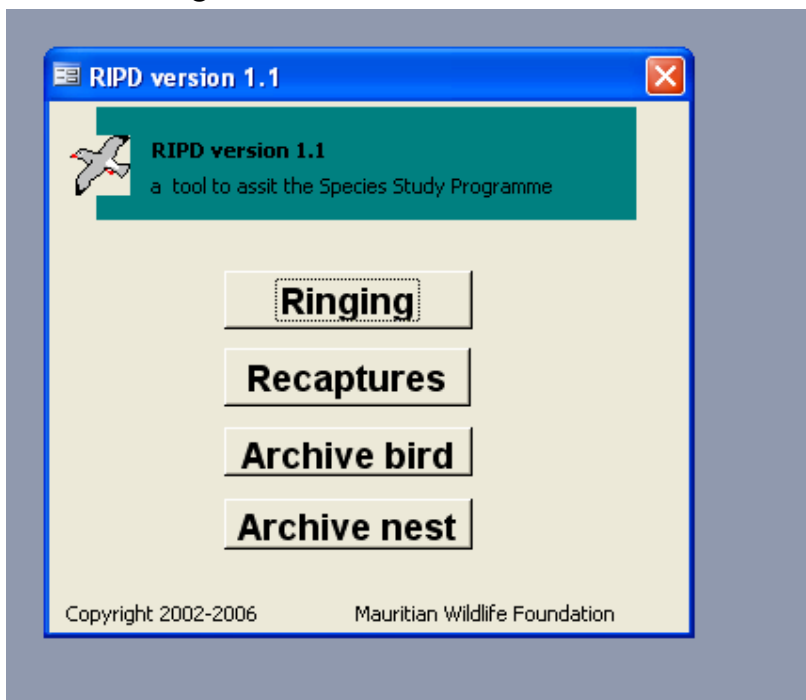


Figure 2. Former version of Echo Parakeet database



### *Round Island Petrel Database (RIPD)*

The Round Island Petrel (*Pterodroma spp. indet.*) database (Figure 4) is currently being used for the study of this complex seabird. The database consists of different fields such as the ringing which gives information about the ringing dates, age class when ringed, which area of Round Island and/or nest sites where ringed, IDs of birds, breeding or non-breeding activity, plumage. The 'recapture' field provides information on the dates of recapture of each bird, where caught, breeding or non-breeding status. The archive nest shows the nesting sites and area of the birds breeding on the island.





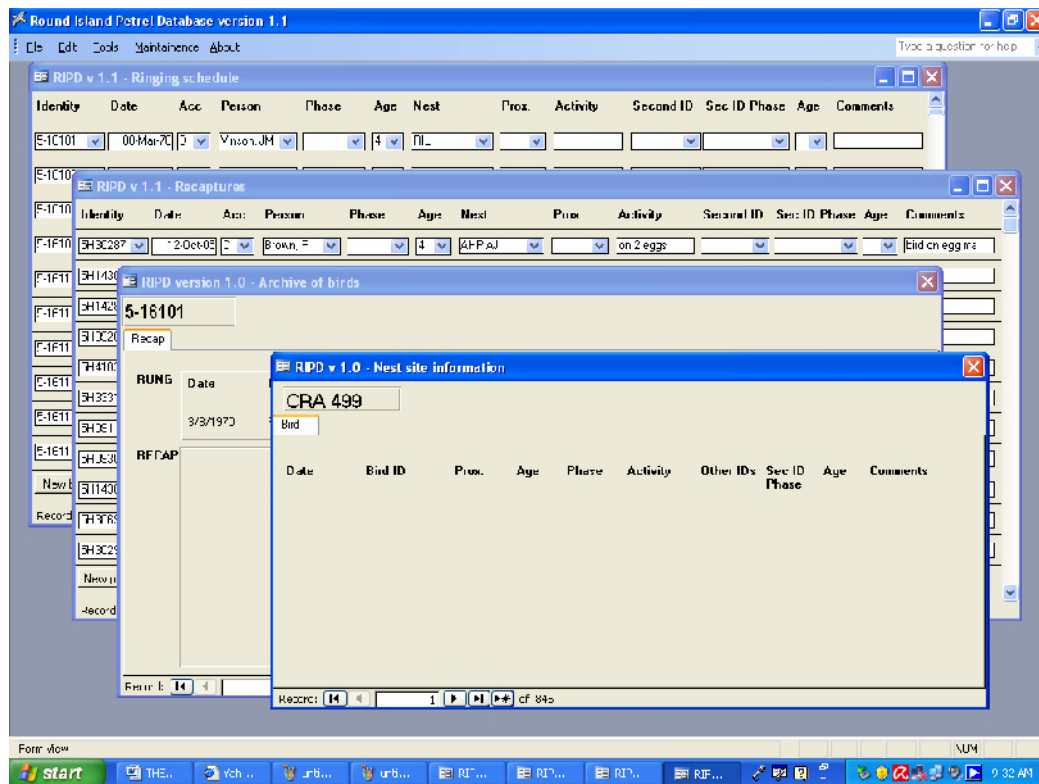
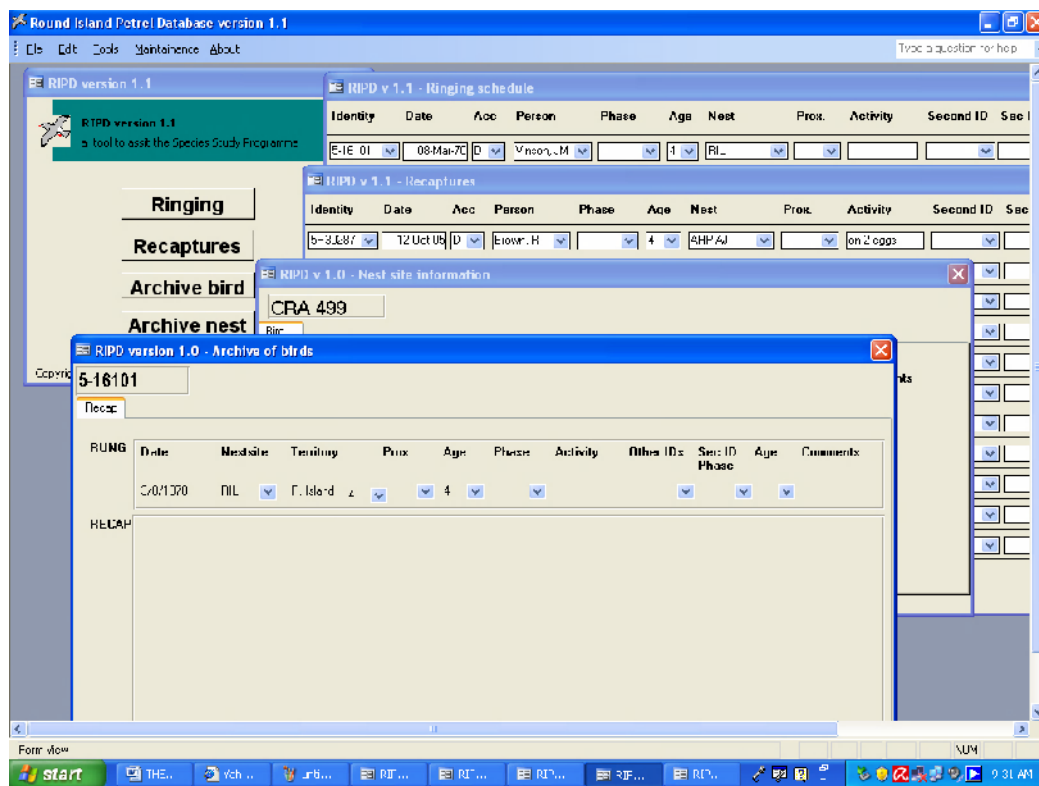
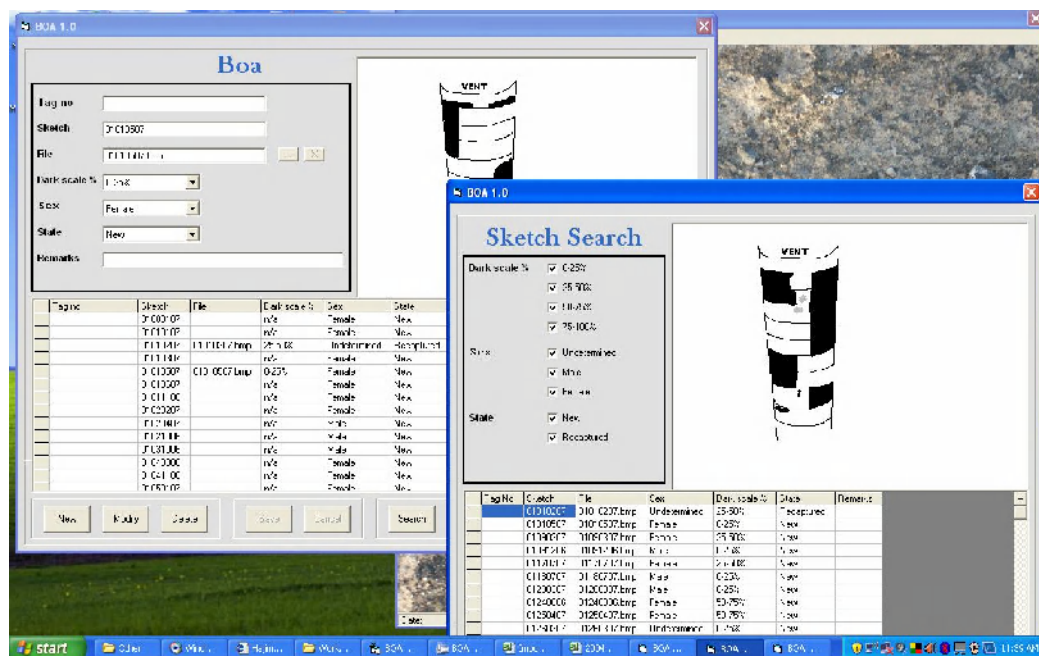


Figure 4. The Round Island Petrel Database

## Round Island Boa Database

The Round Island Boa *Casarea dussumieri* Database (Figure 5) helps us manage information on this most singular reptile. It is expected that in a few years, a vast amount of information will be available on the distribution of this reptile across the different habitats (palm-rich forest, coastal area, grasslands, slab/rocky areas etc) surveyed on the island.

Then, a reliable estimate of the actual size of the population can be obtained. Translocation of these snakes to other islets could be envisaged in the near future so as to ensure its survival as Round Island harbours the last surviving population.



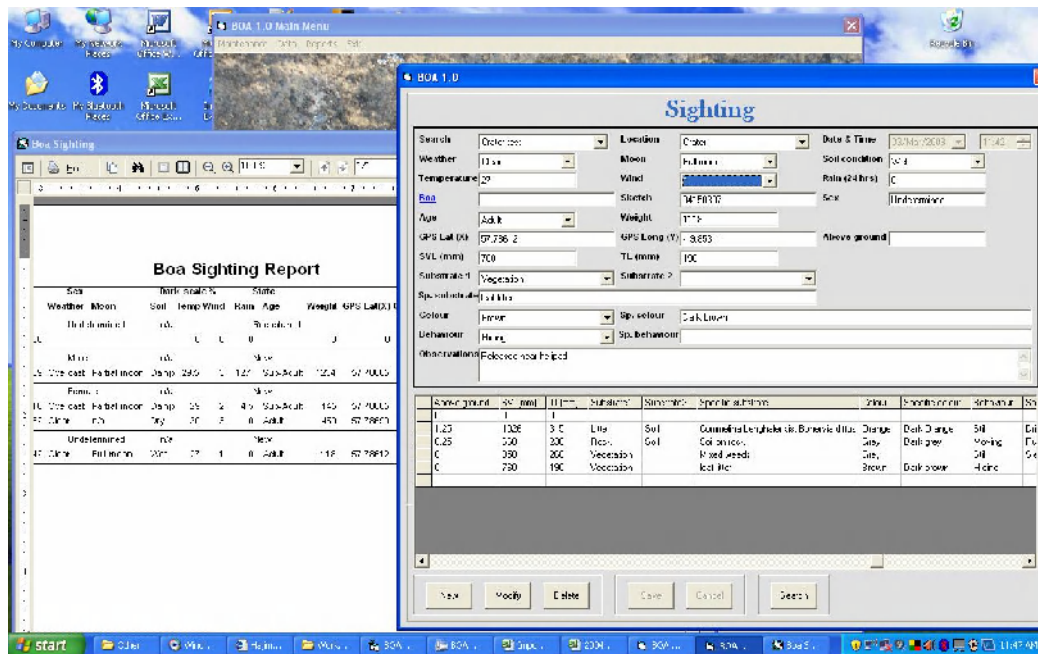
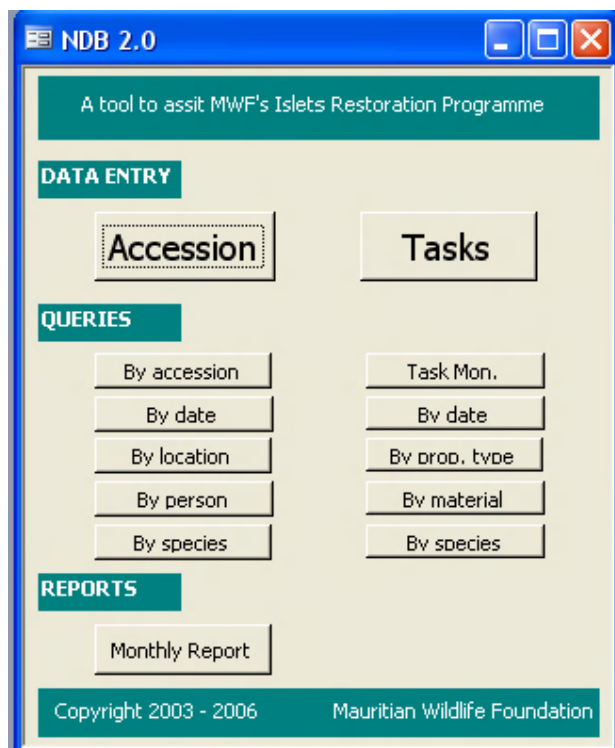


Figure 5. The Round Island Boa Database

### Nursery Database (NDB 2.0)

The Nursery Database (Figure 6) is an important tool for the archiving of plant accessions in and dispatch of plants from MWF's nurseries (Ile aux Aigrettes, Pigeon Wood, Round Island, Rodrigues). It also assesses the germination and growing success in the nurseries. The reporting section of the database groups all the different tasks which have been completed during a specific month.



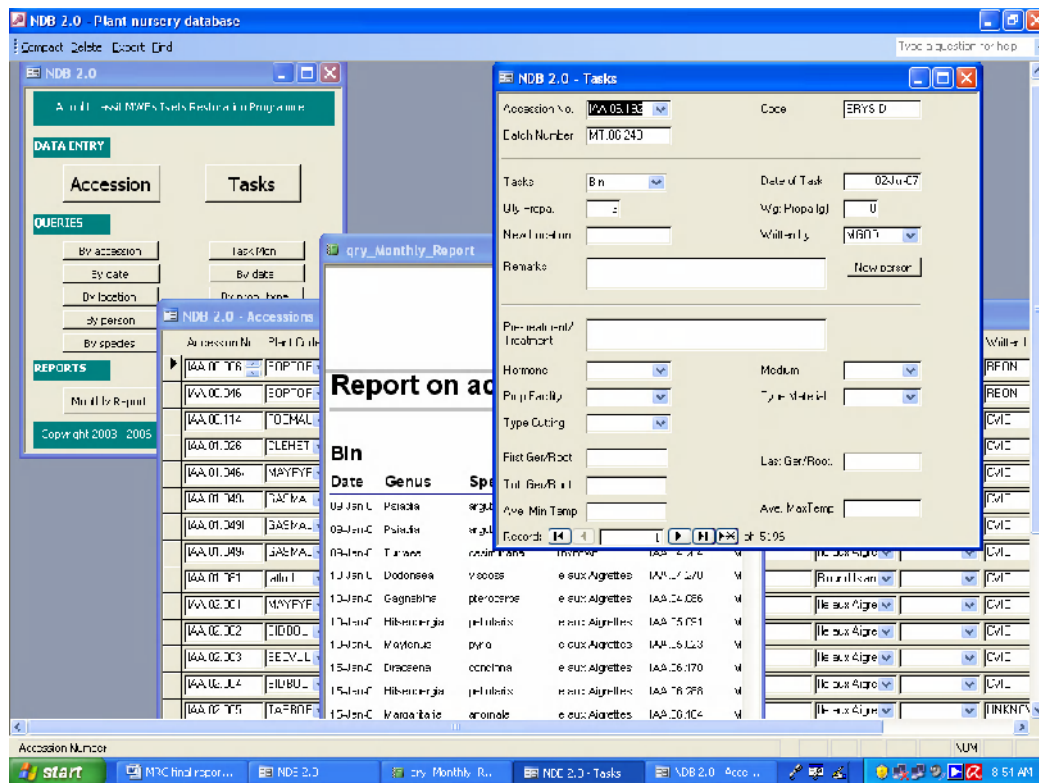


Figure 6. The Nursery Database (NDB2.0)

### *The Conservation Education Workshop*

The education component of this project consisted of the organising of education workshops for secondary teachers and pupils in order to promote biodiversity, which is sparsely covered in the school syllabus. The main aim was to kindle interest and enthusiasm for teaching and learning about our native biodiversity. This component underwent several adjustments, after which it was successfully implemented.

The initial stakeholder consultation was carried out with the assistance of two major stakeholders in education namely the Mauritius Institute of Education (MIE) and the Appui Régional à la Promotion d'une Education pour la Gestion de l'Environnement (ARPEGE) project. It had been observed that although a wealth of information already exists, the information flow from conservation bodies to teachers is inefficient. Hence, a training and discussion was organised with a pilot group of secondary school teachers during a workshop organised in December 2005.



The height of the MRC project was unquestionably the three day workshop organised in June 2007(Figures 7 to 10).



Figure 7. Lecture on botany and biodiversity by Amruta Rane (Phenology Researcher)



Figure 8. Mini-workshop on botanical drawings



Figure 9. Pupils at work for the drawing competition



Figure 10. Filling of questionnaires on native plants

## Field guides






The following field guides have been produced: the 'Phenology', 'Ile aux Cocos' and 'Reptile' guides. Below are some illustrations from the three guides.

### The Ile aux coco guide

Title: *Guide Faunistique et Floristique de L'Ile Cocos (Rodrigues)*

*“L'Ile Cocos est un des derniers joyaux naturels de Rodrigues. Ce domaine des plantes côtières indigènes de Rodrigues et également très appréciée pour ces oiseaux de mer et son paysage. L'île est incontournable pour la grande majorité des touristes, de Maurice ou d'horizons plus lointains, et des Rodriguais. Pas étonnant donc, qu'il soit une fierté pour la toute jeune Rodrigues autonome.....”*

*“La Mauritian Wildlife Foundation tient à remercier Carole Verchère et Sébastien Dufner qui ont grandement contribué à la rédaction du document, ainsi que le Mauritius Research Council qui finance le projet de gestion de bases de données, qui ont été utilisées pour l'évaluation de niveaux de danger des certaines espèces décrites dans ce guide...”*

Oiseaux de mer nicheurs	Oiseaux de mer nicheurs
	
	
	
<p><b>Anous stolidus</b></p> <p><b>Taille:</b> 36-46cm (longueur tête-queue)</p> <p><b>Nom commun:</b> Noddi brun, Noddi commun</p> <p><b>Nom anglais:</b> Common Noddy, Brown Noddy</p> <p><b>Nom local:</b> macoua, malwale</p> <p><b>Caractéristiques:</b> Oiseau de plus grande taille par rapport à la marianne (<i>Anous tenuirostris</i>). La couleur du plumage est brun foncée avec une tâche blanche bien marquée sur le dessus de la tête, sa queue est longue et son bec plus court que la marianne.</p> <p>Les adultes vont se nourrir en groupe durant la journée, ils ne plongent pas mais frôlent les vagues ou enfoncent la tête seulement sous l'eau, à la recherche de petits poissons, calmars et crustacés.</p> <p><b>Nidification:</b> Ils nichent en colonies denses et bruyantes sur les îles. La plupart du temps le nid se situe sur les branches d'arbres (filhos) ou sur le sol, aux pieds des arbres. Il est volumineux et est constitué de branchettes et d'algues. Des débris de coquillages cassés, corail et squelettes de crabes y sont incorporés, assurant ainsi le camouflage du nid. La ponte est constituée d'un œuf unique.</p> <p><b>Distribution:</b> Régions tropicales et subtropicales</p>	<p><b>Anous tenuirostris</b></p> <p><b>Nom commun:</b> Noddi marianne, Noddi à bec grêle</p> <p><b>Nom anglais:</b> Lesser Noddy</p> <p><b>Nom local:</b> malaine</p> <p><b>Caractéristiques:</b> Sa taille est relativement petite par rapport au précédent. Son plumage est noir, puis devient progressivement gris à partir du cou jusqu'à la tête. Le contour de ses yeux est marqué d'une ligne blanche caractéristique pour le reconnaître. Son bec est long et très fin. Les adultes pêchent en groupe et plongeant à quelques mètres sous la surface de l'eau pour attraper de petits poissons et de petits calmars.</p> <p><b>Nidification:</b> Le nid est constitué de feuilles et d'algues cimentés avec du guano.</p> <p><b>Distribution:</b> Ouest de l'Océan Indien et Ouest de l'Australie.</p>



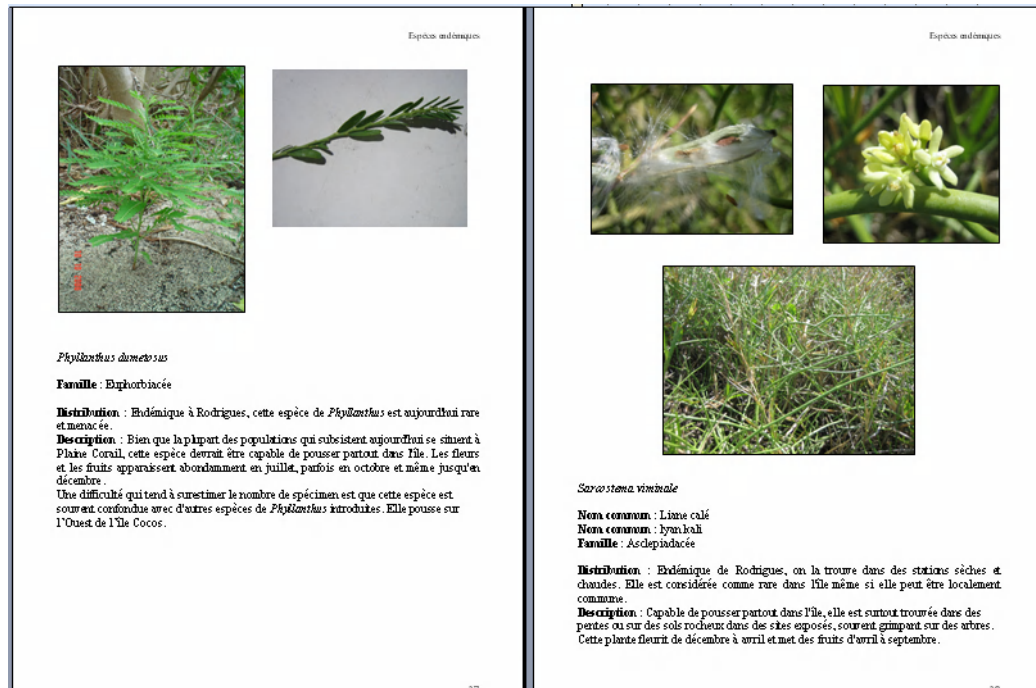
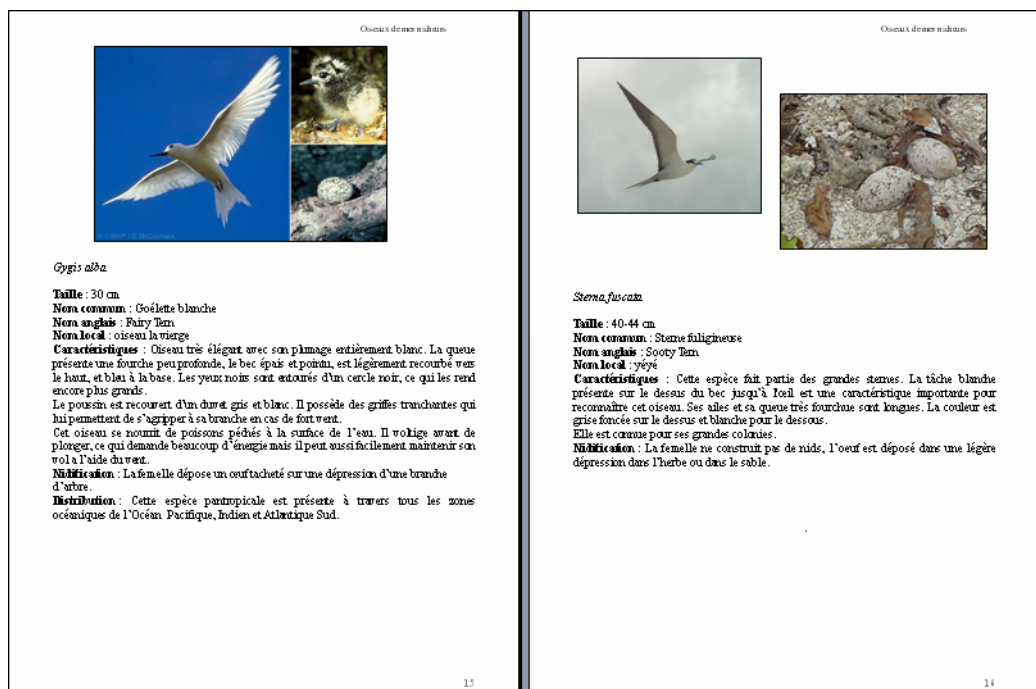








Figure 11. Illustrations from the Ile aux Cocos field guide



## The Phenology guide

Title: *The Phenology Monitoring Manual*

*“The incentive for writing this manual is to help the field staff, volunteers and any interested field scientist understand the notion behind setting up and functioning of the phenology project. Hours are spent in the field looking at trees, trying to quantify the tiniest flowers-fruits whilst filling in lengthy phenology observation sheets. This manual gives a brief background about the rationale behind all this hard work. By taking the time to read this manual and refer documents from the bibliography, the field staff will hopefully find their participation in the phenology project even more meaningful, interesting and enjoyable.....”*

<p><b><i>Chassalia</i> spp</b> Bois Corall Family: Rubiaceae</p> <p>Conservation status: Vulnerable (Corizon), Distribution: Upland forest and mossy forest Critically endangered (Caphuri)</p> <p>MORPHOLOGICAL CHARACTERISTICS</p> <ul style="list-style-type: none"><li>• <u>Habit</u>: Small tree &lt; 4m with lots of branches</li><li>• <u>Bark</u>: Grey</li><li>• <u>Leaf Arrangement</u>: Simple opposite, spread along the branch</li><li>• <u>Leaves</u>: Yellowish green to light green, elliptical, about 10-18cm, thick and shiny, plastic texture, margin curled inside</li><li>• <u>Apex</u>: Pointed</li><li>• <u>Base</u>: Tapering base</li><li>• <u>Petioles/petiole</u>: Petiole (about 1-2cm long)</li><li>• <u>Venation</u>: Reticulate, venation prominent on both the surfaces, distinct mid-rib</li><li>• <u>Inflorescence</u>: Terminal, cyme, head</li><li>• <u>Flower</u>: White or purple or pink, conspicuous</li><li>• <u>Flower</u>: (about 1-2cm, long tubular corolla resembling coral)</li><li>• <u>Fruit</u>: Berry, dark-red or waxy white in colour, oval or ellipsoid, about 5-8mm</li><li>• <u>Expected flowering and fruiting</u>:</li></ul>   	<p><b><i>Cordia alliodora</i></b> Bois pignon Family: Euphorbiaceae</p> <p>Conservation status: Least concern Distribution: Intermediate and upland forest</p> <p>MORPHOLOGICAL CHARACTERISTICS</p> <ul style="list-style-type: none"><li>• <u>Habit</u>: Tall tree (8-15 m in height)</li><li>• <u>Bark</u>: Pinkish-brown bark, watery sap, branches covered with secretions</li><li>• <u>Leaf Arrangement</u>: Simple alternate, leaves grouping at the end of the branches</li><li>• <u>Leaves</u>: Dark green, elliptical, large 20-25cm long, glabrous, entire margin</li><li>• <u>Apex</u>: Pointed acute apex</li><li>• <u>Base</u>: Rounded</li><li>• <u>Petioles/petiole</u>: Long reddish petiole up to 15-20cm long, thick</li><li>• <u>Venation</u>: Reticulate, midrib and primary veins are prominent and yellowish-white</li><li>• <u>Inflorescence</u>: Axillary, simple raceme, sometimes panicle, small orange flowers in sprays</li><li>• <u>Flower</u>: Small about 12mm, orange-yellow, lower buds globose, long and glabrous pedicel, separate male and female inflorescences, male inflorescences with lots of flowers compared to female inflorescences</li><li>• <u>Fruit</u>: Capsule 12-14 mm, roundish, horned fruit in 3 sections</li><li>• <u>Expected flowering and fruiting</u>:</li></ul>   
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Bois de chandelle  
Family: Dracaenaceae

Conservation status: Endangered  
Distribution: Coastal and dry forest

## MORPHOLOGICAL CHARACTERISTICS

- **Leaflet:** Small tree-**stem**
- **Leaf:** Several trunks, tough, grey, ringed with leaf scars
- **Leaf Arrangement:** Whorls of large leaves at end of each trunk
- **Limbs:** Long (0.5 -1m), light green, glabrous, rigid
- **Apex:** Pointed acute
- **Base:** Tapering
- **Petiole/axillary:** Sessile
- **Venation:** Parallel
- **Inflorescence:** Big, terminal, compound raceme
- **Flower:** Tiny, sessile, white, 5 white petals, white long stamens coming out of the petals
- **Fruit:** Bright orange or red when ripe
- **Expected fragrance and taste:**



*Erythropsennium monticolum*

Bois manioc  
Family: Flacourtiaceae (new family-Achatiaceae)

**Conservation status:** Vulnerable  
**Distribution:** Intermediate and Upland forest

## MORPHOLOGICAL CHARACTERISTICS

- habit:** Small tree (4m) with lots of branches
- bark:** Grey with reddish brown lenticels
- Lvs:** *Lanceolate* - simple alternate (sometimes sub opposite towards base of the branch)
- Leaves:** Small, light green, oblong and elliptical about 3cm long and 2-4 cm wide, occasionally leaves have burnt marks on the lamina
- Awns:** Rounded sometimes has a notch
- Base:** Rounded
- Petioles/axils:** Hooked yellow petiole
- Venation:** Opaque, reticulate venation
- Inflorescence:** Terminal, simple raceme
- Flowers:** Small flowers about 1cm with long pedicel
- Fruit:** Capsule hanging on a long pedicel, spherical in shape, smooth, reddish purple, 1-2cm in diameter, opens up side down exposing bright red seeds (3-4).
- Favored flowering and fruiting**




*Tabernaemontana persicariaefolia*

Bois de lait  
Family: Apocynaceae

Conservation status: Endangered  
Dry, intermediate and upland forest

**Distribution:**

## MORPHOLOGICAL CHARACTERISTICS

- Leaf: Small tree (6m).
  - Bark: Brownish grey, smooth, branches in pair, presence of white milky latex
  - Leaf Arrangement: Simple-opposite, clustered at the end of the branch
  - Leaves: Large 18-25cm, shiny light green, elliptical, glabrous, waxy margin, milky latex comes out on breaking or folding the lamina
  - Age: Pointed-obtuse apex
  - Base: Rounded
  - Inflorescence: Petiole about 1-2cm, glabrous
  - Flowering: Heterostylous very distinct white mid-rib, primary veins prominent
  - Inflorescence: Terminal, cyme
  - Flower: Yellowish white, fragrant, 3-10mm long pedicels, 12-25mm long floral buds, white corolla becoming pale yellow
  - Fruit: 4 green fruits in pairs, dehiscent with many seeds,
    - If not glossy, fleshy layer covering the seeds, presence of milky latex
  - Expected Scenture and drawing
- 



*Taraxacum borbonica*

Bois de rat  
Family: Rubiaceae

**Conservation status:** Vulnerable  
**Distribution:** Dry and sub-humid forest

## MORPHOLOGICAL CHARACTERISTICS

- Height: Small tree (~4m).
- Bark: Smooth, light grey or whitish
- Leaf Arrangement: Simple opposite, mainly towards end of the branch
- Leaves: Heterophyllous, juvenile leaves light green-yellowish, linear, adult leaves dark green, oblong-elliptical, about 5-8cm
- Apex: Pointed obtuse apex (juvenile), rounded obtuse (Adult)
- Base: Tapering to round
- Petiole/Node: Very short petiole in juvenile but long about 1cm in adult
- Flowering: Retraculate, midrib bright red in juvenile leaves
- Inflorescence: Terminal, cyme, 5-7cm
- Flower: Fragrant, white, about 1cm
- Fruit: Globular, 6mm in diameter, dark green
- Specialised flowering and fruiting

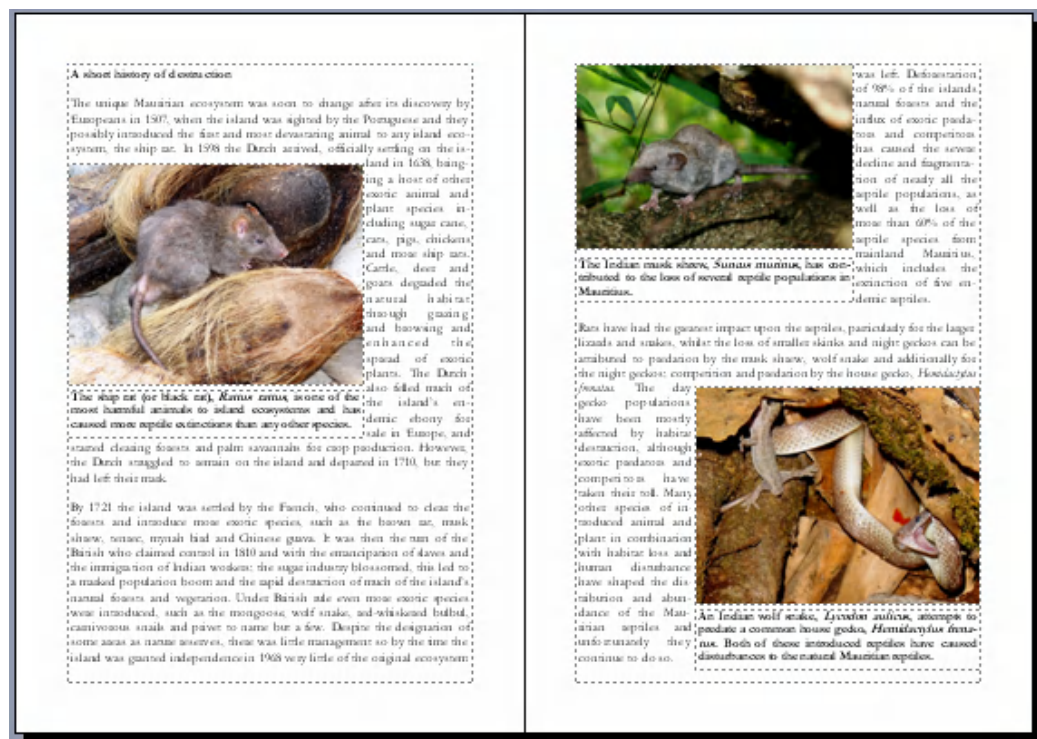


Figure 12. Illustrations from the Phenology guide

## The Reptile Guide

Title: *Amphibians and Reptiles of Mauritius*

*“This is a non-scientific guide for the identification of the native and introduced reptiles and amphibians of Mauritius and its offshore islands. The guide starts with a brief introduction to Mauritius, its history of destruction and the impact this has had upon the Country’s unique reptiles. The guide continues by listing the reptile species that have become extinct and the exotic reptiles and amphibians that pose a threat of becoming established. Each of the 35 known species that currently occupy Mauritius are then described starting with the geckos, then skinks, snakes, tortoises, turtles and amphibians.....”*



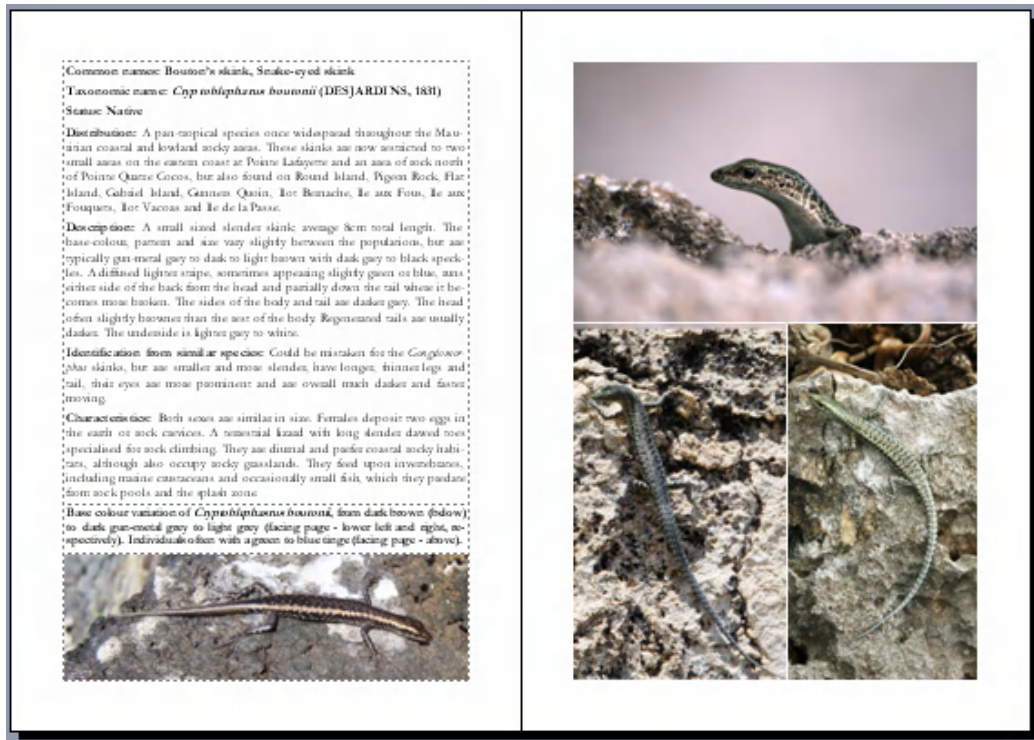
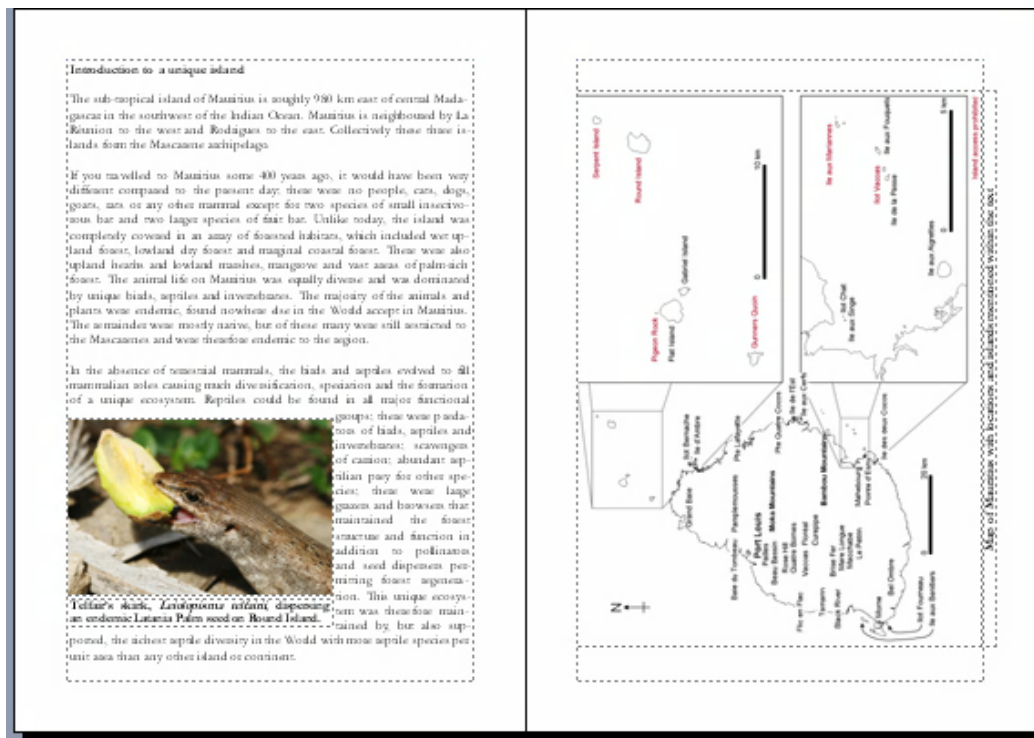


Figure 13. Illustrations from the Reptile guide

## **Conclusion**

The components scheduled in the MRC project have been successfully implemented, although some underwent delays in their implementation, which were often beyond our control.

Several databases have been created and/or modified to facilitate task of users and improve data retrieval and analysis. These databases are functional and capable of generating data already.

The education workshops have been completed following modifications, but in the end have achieved their desired objectives. The lessons learnt from these have now been integrated in the RARE Pride Campaign, an education programme currently being implemented by MWF.

Three field guides (two of which will be for sale and distribution to the public) have been produced, and information from the databases were used in two other field guides that are sold to the public, namely 'A guide to the plants in Mauritius' and 'The native Plants and Animals of Mauritius'.

The main lesson learnt from the MRC funded projects are that databases continuously need to be created or improved so that they can serve as strategic management tools in conservation.

It also became clear that conservation awareness was not being sufficiently addressed in our education system, leaving students unaware of the biological richness of Mauritius and the need to preserve this unique heritage. We also demonstrated that conservation education could help in the promotion of several subjects, including biology, ecology, languages, arts, history, geography, mathematics etc and that there was interest from both teachers and pupils for further development in the curriculum to reflect this.

With the last point in mind, the Mauritian Wildlife Foundation is keen to discuss a follow-up project with the Mauritius Research Council, with a major focus on conservation and environmental awareness, and with ramifications into the Science and Arts curriculum.



## **Acknowledgements**

The Mauritian Wildlife Foundation wishes to thank the Mauritius Research Council for its continuous support to conservation and for having funded conservation databases - a strategic management tool. We also wish to extend our gratitude to the various partners and supporters, throughout the duration of this three year project; the National Parks and Conservation Service, the Ministry of Education and Human Resources, the AREGE Project (Indian Ocean Commission), teachers and pupils from participating schools, the Forestry Service, the Darwin Initiative Project and MWF staff members who have taken a keen interest in the project.