

# CEPF SMALL GRANT FINAL PROJECT COMPLETION REPORT

## I. BASIC DATA

**Organization Legal Name:** Mabuwaya Foundation Inc.

**Project Title (as stated in the grant agreement):** A re-enforcement strategy for the critically endangered Philippine crocodile population in the Northern Sierra Madre: pilot project

**Implementation Partners for This Project:** Local Government Unit of San Mariano, Department of Environment and Natural Resources, Isabela State University.

**Project Dates (as stated in the grant agreement):** January 1 to June 30, 2007

**Date of Report (month/year):** September 2007



**Picture 1:** Jerica Miranda holds a hatchling crocodile in July 2006 (photo by Jan van der Ploeg). Eight months later the animal was released back to the wild (photo by Merlijn van Weerd)

## II. OPENING REMARKS

**Provide any opening remarks that may assist in the review of this report.**

The Philippine crocodile (*Crocodylus mindorensis*) is a critically endangered species endemic to the Philippines. A small and fragmented population survives in the northern Sierra Madre on the island of Luzon. The Mabuwaya Foundation Inc. aims to conserve the Philippine crocodile in its natural freshwater habitat in northeast Luzon in cooperation with the Local Government Unit (LGU) of San Mariano, the Department of Environment and Natural Resources (DENR) and the Isabela State University (ISU). The community-based conservation strategy has four components:

1. Action research and monitoring: generating the necessary scientific information for the conservation of the Philippine crocodile;
2. Communication, education and public awareness (CEPA): mobilizing public support for the conservation of the Philippine crocodile in the wild;
3. Protection and capacity building: establishing Philippine crocodile sanctuaries with the consent and participation of local communities and enforcing environmental laws;
4. Livelihood support: adopting an ecosystem approach to alleviate poverty in areas where crocodiles survive;

Conservation action for the species started in 2000. Seven years later, Philippine crocodiles are no longer purposively killed in the municipality of San Mariano, illegal fishing methods are banned and the majority of the people actively supports the conservation of the species in the wild (see also van Weerd et al. 2006; van Weerd & van der Ploeg 2006). However, the Philippine crocodile population in San Mariano is still critically small. Specific action is needed to create the necessary conditions for the recovery of the species in the wild.

This pilot project laid the ground work for a head-start program for the Philippine crocodile. Crocodile nests were protected. International crocodile specialists were consulted. A permit was secured from the Department of Environment and Natural Resources to collect Philippine crocodile hatchlings in the wild. A low-cost head-start facility was established in cooperation with the Local Government Unit of San Mariano. A caretaker, Mr. Carmilo Paguirigan, was trained to take care of the crocodiles. The head-start facility was officially opened on August 28 by the municipal Mayor and the provincial Governor.

These have been important steps. But much remains to be done to assure a recovery of the species in the northern Sierra Madre. Forty-seven Philippine crocodiles are now held in the municipal Philippine crocodile rearing station and will be released back to the wild. Additional funding was secured from Melbourne Zoo, and several other partners have indicated their support for the head-start program (for example the Provincial Government of Isabela). But continued financial support from CEPF in the coming years is needed to make the re-enforcement strategy successful. The results of this pilot project will be used to draft, in cooperation with the LGU San Mariano, ISU and the DENR, a follow-up project proposal that will be submitted to CEPF.

### III. NARRATIVE QUESTIONS

#### 1. What was the initial objective of this project?

The main goal of the pilot project was to create the necessary conditions for the recovery of the Philippine crocodile population in the wild in the northern Sierra Madre. The CEPF funding enabled the Mabuwaya Foundation to investigate the possibilities of setting up a **head-start program** for the Philippine crocodile in the municipality of San Mariano. We have proved that this is a viable strategy for the recovery of the species in the wild and have secured the necessary permits and political support to do so. The lessons and experiences of the pilot project will be used to draft a comprehensive project proposal for follow-up activities that will be submitted to CEPF.

In the pilot project proposal several specific activities were identified:

##### 1. Nest protection

- a. **Searching crocodile nests:** in June 2007 two nests were located by farmers in Disulap River and Dinang Creek and reported to the *Bantay Sanktuwaryo* (the local protection group). In Disulap River arrangements were made with the *Bantay Sanktuwaryo* to guard the nest (see below). When the team arrived in Dinang Creek it was discovered that the nest had been destroyed (who did it and why remains unclear). A third nest was discovered by a small boy in Dinang Creek in August. When the team got to the site the nest was hatching.
- b. **Guarding crocodile nests:** we made arrangements with the *Bantay Sanktuwaryo* members to guard the nest in Disulap 24 h/day (2 team members guard the nest and earn PhP. 250 per day per person). The guardians camp at a distance (approximately 50m) and prevent people from getting close to the nest. A temperature logger was placed in the nest to gather scientific information. Unfortunately the nest was completely destroyed by a monitor lizard and rats.
- c. **Rewarding communities for successfully hatched crocodile nests:** twelve crocodiles hatched in Dinang Creek in *barangay* Cadsalan: the Mabuwaya Foundation gave PhP. 6000 to the barangay fund (and PhP. 500 to the boy who discovered the nest). The hatchling reward scheme has generated a lot of positive feedback from rural communities. It works as follows: when crocodile eggs successfully hatch (to be verified by our team) the village (*barangay*) receives PhP. 500 for each hatchling. This reward goes to the development fund of the community. This development fund is used for all kinds of small development activities such as assistance to school children, the construction of a rice and corn drying pavement for the community, etc. Successful crocodile breeding thus benefits the whole community. Through the reward is not very high (the maximum number of Philippine crocodile hatchlings so far was 24 from one nest), it is highly appreciated by the community: above all it's a symbolic gesture recognizing the conservation efforts of local people.

##### 2. Head-start program

- a. **Secure permits for a head-start project:** we had several meetings with the staff of the Protected Areas and Wildlife Service of DENR in Tuguegarao and with the Protected Areas and Wildlife Bureau in Manila. We submitted an application for a gratuitous permit (GP) for a head-start facility to PAWS. This is a requirement under the Wildlife Act (R.A. 9147). PAWS forwarded the request to PAWB. PAWB requested the members of the national Philippine crocodile recovery team

to comment on the proposal to set up a head-start facility. We incorporated the suggestions of the members of the recovery team in the proposal and re-submitted the proposal to PAWB. PAWB endorsed the proposal and requested PAWS in Region 02 (the Cagayan Valley) to issue the permit. We would like to acknowledge the valuable support of Dr. Restituta Antolin, Dr. Tony Manila and Dr. Mundita Lim of DENR. Special thanks to Dr. Kent Vliet (Crocodile Advisory Group University of Florida), Mr. Chris Banks (Melbourne Zoo) and Ms. Collette Adams (Gladys Porter Zoo) who provided recommendations letters for the head-start facility.

- b. **Collect hatchlings:** twelve hatchlings were collected in Dinang Creek in July 2007 and are now kept in the municipal Philippine crocodile rearing station.
- c. **Establish infrastructure:** Mr. Jerome Miranda, the chairman of the committee on environment of the *Sanguniang Bayan* of the municipality of San Mariano, gave permission to use a building on his land. The building was renovated: walls were built and a drainage system was constructed. Crocodile hatchlings are kept in an aquarium. Juveniles are kept isolated in drums (donated by two airline companies). Informative billboards, designed development communication students of Isabela State University under the supervision of Dr. Myrna Cureg, were placed to inform visitors on the head-start facility. The facility was officially opened (see picture 2) on August 28 by the Municipal Mayor and the Provincial Governor. The event got extensive media coverage. GMA7 and ABS-CBN (the two main channels in the Philippines) filmed the opening. Articles were written in leading newspapers (Philippine Star and the Philippine Daily Inquirer) and a local FM station (Bombo Radyo) covered the event live.



**Picture 2:** On August 28 the municipal Philippine crocodile rearing station in San Mariano was officially opened by Municipal Mayor Edgar T. Go (3<sup>rd</sup> from left) and Provincial Governor Grace. C. Padaca (4<sup>th</sup> from left). Students of the Bitun theater group of Isabela State University pose as crocodiles (photo by Dominic Rodriguez).

- d. **Feeding and maintenance:** international crocodile experts were consulted to assure crocodiles are well taken care for in the rearing station. Geoff McLeod, an Australian crocodile farming consultant, provided advice on crocodile husbandry in February 2007. Mr. Chris Banks (curator at Melbourne Zoo), Mr. Terry Cullen (veterinarian at Cullen Vivarium) and Mr. Boyd Simpson (FFI Cambodia) also visited the head-start facility and made recommendation on how to improve the facility. We prepared a husbandry manual for the head-start program. Dr. Glenn

Rebong and Mr. Rainier Manalo of PWRCC provided valuable suggestions on how to optimize the conditions for the captive juvenile crocodiles. Arrangements were made with Ms. Jade Careon, the owner of the largest poultry farm in the area, to obtain a structural supply of meat. In addition fish and meat is purchased on the market to feed the crocodiles every other day. A care taker was assigned and trained to feed the crocodiles, clean the drums and provide information to visitors.



**Picture 3:** *Sanguniang Bayan* member Jerome Miranda and Mabuwaya Foundation staff member Bernard Tarun in the head-start facility in San Mariano (photo by Merlijn van Weerd)

### 3. Information dissemination:

- a. **Communication:** a regional Philippine crocodile recovery team meeting was held on August 2, 2007 to update all stakeholders on the head-start program and the other conservation activities for the Philippine crocodile in the northern Sierra Madre.

## 2. Did the objectives of your project change during implementation? If so, please explain why and how.

During the implementation of the pilot project it became clear that it is essential that the head-start program has to be implemented as an integrated component of an in-situ conservation strategy. First, communication, education, and public awareness (CEPA) is essential for the head-start program. An advantage of the head-start facility is that it can serve as visitors-center, where people can get information about crocodiles and see the crocodiles. Second, habitat protection is needed to ensure that crocodiles are adequately protected when released back to the wild. Third, benefits to local communities are essential to mobilize local support for crocodile conservation. Most people in San Mariano survive on less than 2 US\$ per day. A potential link between crocodile conservation and local peoples' livelihood could be scholarships for schoolchildren. Children would give their name to a crocodile that will be released back to the wild. In return for taking care for the crocodile (preventing hunting, destructive fishing and habitat destruction), the child receives a small allowance that will enable it to go to school. A follow-up proposal has to focus on these components.

### **3. How was your project successful in achieving the expected objectives?**

All objectives of the pilot project have been achieved. The fact that crocodile conservation action has continued over the past seven years has been instrumental for the success of the pilot project. Over the past years we have developed good contacts at the national, regional and local level with all major stakeholders. This has greatly facilitated the project implementation, especially in securing the DENR permit. Mabuwaya Foundation staff has extensive experience working with crocodiles in the remote uplands of San Mariano. They have developed personal relationships with many people in the field, which is essential for the success of the community-based conservation program.

### **4. Did your team experience any disappointments or failures during implementation? If so, please explain and comment on how the team addressed these disappointments and/or failures.**

Two crocodile nests were lost in 2007. In Disulap River natural predators (rats and monitor lizards) ate the eggs. In Dinang Creek people were responsible for the destruction of the nest (but the specific details remain unclear). This is a serious set-back for the project. It shows that it is essential to guard nests and to inform everybody on the importance of crocodile nests. In Disulap River the *Bantay Sanktuwaryo* guarded the nest but failed to stop natural predators. An alternative would be that the guardians stay very close to the nest, but this could hamper possible maternal protection and care for the nest. The team is currently assessing the most effective strategy to guard crocodile nests against natural predators. In areas where crocodile hatchlings have good survival chances (based on the results of the quarterly monitoring program of the Mabuwaya Foundation) hatchlings will not be collected. In 2007 no nests were found in Dunoy Lake or along Catalangan River.

Four juvenile crocodiles were seriously injured by infighting in the rearing station. The crocodiles appear to be very aggressive towards each other in captivity. Therefore it was decided to keep the crocodiles isolated in individual drums.

Another problem in the head-start program is that the 2006 hatchlings were not rapidly growing. Hatchlings are measured every month to monitor the weight, length and health of the crocodiles. It appears that the relative cold period in December 2006-March 2007 affected the growth of the juvenile crocodiles in the head-start program. A solution can be the placement of the drums in the sun or the set up of lights on top of the drums.

As the Mabuwaya Foundation has very limited funds, it is essential to keep the costs of the rearing station as low as possible. However, several investments would significantly improve the head start facility (such as an electric water system). Feeding is also proving to be more expensive than initially anticipated. Melbourne Zoo has indicated that it will financially contribute the head-start facility. At the moment we're also drafting proposal for the provincial government of Isabela.



**Picture 4:** Philippine crocodile nests are guarded by the local community. Here, a signpost in Disulap River informs people of a crocodile nest (photo by Jan van der Ploeg).

**5. Describe any positive or negative lessons learned from this project that would be useful to share with other organizations interested in implementing a similar project.**

Obviously, there are several potential problems with head-starting. There is no reliable scientific information on whether head-starting *C. mindorensis* will actually work. The question is how to deal with this uncertainty? Several specialists pointed out that it was not clear whether the Philippine crocodile would be able to adapt to the wild after being in captivity for several months and thus advised against the head-start program. Our position has been that we would monitor the head-start program and document the outcome (in this view the head-start program is an experiment to determine whether this strategy would be an effective strategy to conserve the Philippine crocodile in the wild). The results of the monitoring program (from 2000 to 2007) indicated that if we would not collect hatchlings from the wild these animals would die. Determination was needed to overcome initial skepticism and conservatism. Uncertainty should not lead to passivity, as it has often done in Philippine crocodile conservation.

The challenge in setting up the head-start program was to convince other stakeholders on the viability of this approach. We were dependent on the approval of the permit by PAWB. PAWB on its turn requested the opinion of several other specialists in the Philippines. This was a long and complicated process. International support from the IUCN crocodile Specialist Group and local pressure from the municipal government of San Mariano, the regional PAWS and Isabela State University eventually convinced DENR that a permit should be issued. The extensive network of the Mabuwaya Foundation built over the past seven years was instrumental in securing the permit.

Crocodile conservation in the Philippines has long been hampered by the assumption that local communities do not support the conservation of the species in the wild. Therefore, the focus of crocodile conservation in the Philippines has been nearly exclusively on ex-situ conservation action (captive breeding). In San Mariano, we have shown that with an effective CEPA campaign, rural communities will actively support the conservation of the species in its natural habitat and the release of crocodiles back to the wild. This is perhaps the most important lesson from this project, which has far-reaching implications for crocodile conservation in the Philippines.

**6. Describe any follow-up activities related to this project.**

We have set up a head-start facility. Forty-seven Philippine crocodiles are now kept in the municipal Philippine crocodile rearing station ((35 from 2006 and 12 from 2007). It is envisioned that these juvenile crocodiles will be released in March 2008 back to the wild. The long-term effectiveness of the head-start program can only be determined if these released crocodiles will successfully breed in the wild. That will take at least 10 years.

We are working on the continuity and sustainability of crocodile conservation action in the northern Sierra Madre. The Mabuwaya Foundation has become the focus point of crocodile conservation action in North Luzon. Funding for the conservation program was secured until January 2009 (with a grant from IUCN-NL: focus on community-based wetland conservation). Nest protection and head-starting (embedded in the larger conservation strategy) can save the Philippine crocodile from extinction in the wild. This pilot project has identified the activities that will lead to a full recovery for the species in the northern Sierra Madre. As was indicated in the proposal for this pilot project, a follow-up proposal will be developed with the LGU San Mariano, ISU and DENR and submitted to CEPF. With US\$ 20,000 per year for a period of five years we can save this critically endangered species in the Sierra Madre corridor.

**7. Please provide any additional information to assist CEPF in understanding any other aspects of your completed project.**

The last official estimate was that there were less than 100 adult Philippine crocodiles surviving in the wild in the entire Philippine archipelago (Ross 1998). The population in San Mariano consists of 3 reproducing sub-populations (Dunoy Lake, Disulap River and Dinang Creek). The Dunoy Lake area has at least 3 adult females, including the 2 adult females released by us in August 2006 (Gloria) and August 2007 (Isabela) and 1 adult male. Disulap River has one pair of adult crocodiles. Dinang Creek has at least 2 adult females and 1 adult male. In addition there are 6-10 large juvenile/sub-adult crocodiles in San Mariano that, if they survive, will reach reproductive size (1.5 m length) within the coming 2-3 years. This is the only wild population which is regularly monitored (on a quarterly basis) in the entire country. At present our project in the northern Sierra Madre is the only in-situ conservation action for the Philippine crocodile.

Conservation action for the species in the northern Sierra Madre has a strong scientific basis. The pilot project has resulted in valuable scientific information. Philippine crocodile nests were described in detail (the first documented records in the wild), and the hatching of a nest was documented.



**Picture 5:** Philippine crocodile hatchling



#### IV. ADDITIONAL FUNDING

**Provide details of any additional donors who supported this project and any funding secured for the project as a result of the CEPF grant or success of the project.**

Donor	Type of Funding*	Amount	Notes
Melbourne Zoo	A	US\$ 8040	Project title: Philippine crocodile <i>Crocodylus mindorensis</i> Head-starting and Reintroduction Program Northeast Luzon, Municipality of San Mariano, Isabela, the Philippines Focus: Head-start Start: September 2007 Contact person: Mr. Chris Banks (cbanks@zoo.org.au)
Mr. Jerome Miranda	A	US\$ 6000	Mr. Miranda gave permission to use a building on his private lot for the head-start facility (estimated costs: PhP 5000 rent per month * 5 years).
Ms. Jade Careon	A	US\$ 1040	Ms. Careon donates chicken (mortalities) from her poultry farm to the head-start program (estimated costs PhP 200 per week * 5 years).
Chemtrad Aviation Corp. and Cyclone Aviation Corp.	A	US\$ 640	Chemtrad and Cyclone donated 40 empty drums for the head-start facility (PhP. 800 per drum).
Ecosystem Grant Program IUCN-NL	B	US\$ 54,800	Project title: Welcome to Crocodile Valley: strengthening community-based wetland conservation in the Cagayan Valley Focus: Communication and wetland conservation Start: August 2007 Contact person: Ms. Maartje Hilterman (maartje.hilterman@nciucn.nl)
Van Tienhoven Foundation	B	US \$ 12,330	Project title: Philippine crocodile <i>Crocodylus mindorensis</i> conservation in NE Luzon, the Philippines. Focus: habitat restoration and release Start: April 2006 Contact person: Dr. Eric Dekker (dekker@naturalis.nl)

**\*Additional funding should be reported using the following categories:**

- A** Project co-financing (Other donors contribute to the direct costs of this CEPF project)
- B** Complementary funding (Other donors contribute to partner organizations that are working on a project linked with this CEPF project)
- C** Grantee and Partner leveraging (Other donors contribute to your organization or a partner organization as a direct result of successes with this CEPF project.)
- D** Regional/Portfolio leveraging (Other donors make large investments in a region because of CEPF investment or successes related to this project.)

## V. ADDITIONAL COMMENTS AND RECOMMENDATIONS

It is envisioned that all crocodiles in the head-start program will be released to the wild. The experiences in San Mariano so far suggest that this is an effective strategy to re-enforce the Philippine crocodile population in the municipality. The long-term viability of the head-start program remains to be seen: it's expected that these juveniles will be reproducing adults at the age of 10 years old. The goal of the head-start program is to re-enforce the Philippine crocodile population in San Mariano. We aim to release crocodiles back to the wild, with the consent and support of local people. On February 5, four juvenile hatchlings were released back in an artificial lake in the Disulap River municipal Philippine crocodile sanctuary. These crocodiles were rescued from a nest in Disulap River that was attacked by fire ants when hatching, and raised in captivity. This was a pilot release. Researchers of Isabela State University and Leiden University monitored the juvenile crocodiles for four months (at present they are analyzing the data). It appears that the pilot release has been successful: all juveniles are still alive and have successfully adapted to their natural habitat. The juveniles are now monitored on a quarterly basis. Two adult female crocodiles were also released on August 28, 2006 in a small lake in the Catalangan River watershed (Margie) and on August 28, 2007 in an artificial lake in Dunoy (Isabela). With the continued support of CEPF we hope to release more crocodiles back to the wild in San Mariano in the coming years!



**Picture 6:** Mr. Nicanor Layugan, a member of the Bantay Sanktuwaryo, releases a juvenile crocodile in the Disulap River municipal Philippine crocodile sanctuary (photo by Merlijn van Weerd)

We would like to thank the following Dr. Mundita Lim, Dr. Antonio Manila, Dr. Restituta Antolin and For. Mina Labuguen from the DENR; Dr. Myrna Cureg, Prof. Juliet Umayam, Prof. Joycy Taguinod, Prof. Miladis Afidchao, the Bitun Cultural Group and the DEVCOM and Biology students from Isabela State University; Governor Grace Padaca, and provincial board member Ana Go of the provincial government of Isabela; Mayor Edgar T. Go, *Sangunian Bayan* member Jerome Miranda, Ms. May Ann Gelacio and Ms. Cora Pua of the local government unit of San Mariano; Dr. Robert Arano; Ms. Jade Careon, Capt. Camposagrado, Capt. Mauro Barradas and Mr. Carmilo Paguirigan; Dr Angel Alcalá and Dr. Charles Ross of Siliman University; Dr. Glenn Rebong and Mr. Rainier Manalo of PWRCC; Mr. Chris Banks, Dr. Kent Vliet, Ms. Colette Adams, Dr. Terry Cullen, Mr. Geoff McLeod, and Dr. Grahame Webb of the IUCN Crocodile Specialist Group; and many other people who have contributed to the implementation of this pilot project.

## VI. INFORMATION SHARING

CEPF is committed to transparent operations and to helping civil society groups share experiences, lessons learned and results. One way we do this is by making programmatic project documents available on our Web site, [www.cepf.net](http://www.cepf.net), and by marketing these in our newsletter and other communications.

These documents are accessed frequently by other CEPF grantees, potential partners, and the wider conservation community.

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## VII. REFERENCES

- Ross, P.J. 1998. Crocodiles, status survey and conservation action plan. 2nd edition. IUCN/SSC Crocodile Specialist Group, Gland and Cambridge.
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- Van Weerd, M., J. van der Ploeg, D. Rodriguez, J. Guerrero, B. Tarun, S. Telan and J. de Jonge. 2006. Philippine crocodile conservation in Northeast Luzon: an update of population status and new insights into *Crocodylus mindorensis* ecology. In: *Crocodiles*. Proceedings of the 18th working meeting of the crocodile specialist group, IUCN. Gland, Switzerland. p. 305-320.