

Chapter 34

The Re-introduction of the Oriental Pied Hornbill to Singapore

Ng Soon-Chye with Marc Cremades



My journey with Nature has been, and still is, a journey in which I (SC Ng) met so many people from all walks of life, and I have been blessed by my association with these dedicated and passionate people, many of whom have larger-than-life personalities. This written piece is but a small slice in the kaleidoscope of my humbling, yet enormous experience with nature. This story is but a small peek into the vast experiences of the people I have met. And it is a pleasure to share this particular journey with Marc Cremades, a special friend. I come from a medical background, especially in human reproduction, where I developed the first in-vitro fertilisation (IVF) programme in Singapore, and was responsible for Asia's first "test-tube" baby in 1983. Marc's background was even more exciting: he spent 10 years on conservation projects in Madagascar, as well as worked on two wildlife movie documentaries (one being the award winning "Winged Migration"). In addition to co-initiating the Hornbill Project, he has also contributed to numerous breeding and



conservation programmes for the Jurong Bird Park. He is now tasked to rejuvenate two new attractions in the Mandai Parks (Bird Paradise and Rainforest).

We are now relatively familiar in Singapore with the sight of this huge black-and-white noisy bird, the Oriental Pied Hornbill, seen even in Orchard Road. This was not the case in the early to mid-1990s, when occasional sightings were probably either escapees or visitors from Peninsular Malaysia to Pulau Ubin. The Oriental Pied Hornbill was recorded for the first time in Singapore by Sir Alfred Russell Wallace in 1855. It seems to be subsequently observed but not formally recorded. It was only in 1994 when two observations were recorded of at least a pair on Pulau Ubin. The first nesting was recorded on the same island in 1997. The proximity of the southern Peninsular Malaysian forest facilitated the Oriental Pied Hornbill's return to Singapore.

This Hornbill Project story started when I had a chance meeting with Marc Cremades during a bird watching trip in Sungei Buloh Wetlands Reserve, with the first record of discussion on the project with Marc on 2 November 2003. Our first partnership was with the National Parks Board (NParks), who was very supportive of the idea. During the life of the project, we had fantastic support from various NParks officers including Wong Tuan Wah, Dr David Davison, Soon Kiong Koh, Robert Teo, James Gan, Alan Tan, and Mark Lim.

The next partnership was with Jurong Bird Park (Daisy Ling and Dr Wong Hon Man) and with a tertiary academic institution to involve their students, giving them an opportunity to be involved in conservation. As I was then an adjunct in the School of Biological Sciences in Nanyang Technological University (NTU), I managed to convince the School to be involved. We had over 50 NTU students

participating over five years, and Ms Lai Huimin was particularly outstanding. Prof Kok Zuea Tang, from the National University of Singapore (NUS) Computer Studies Department, and Dr Tan Kok Kiong who was then with the Department of Electrical and Computer Engineering, were also particularly helpful. In addition to local help, we also had international help, including Professor Pilai Poonswad, the world authority on Asia Hornbills and Dr Alan Kemp, the authority on Hornbills. Funding for the project from generous benefactors included especially the late Lady Yuen Peng McNeice, and her son Terry; and Mr Philip Ng of Far East Organisation. And when the project first started in Pulau Ubin, local knowledge and help came from a host of Ubin residents, especially Mr and Mrs Sapieh, Mrs Li Hua and Yeo Chong Huat. This extensive list emphasises the need for a network of help and hands, and that success will come only when there is involvement at all levels.

Our first field studies were classical observations with binoculars and video cameras. We started to count the number of round trips to the nest cavity of the male and identify the nesting materials and the food offered to the female. We very quickly realised that our data was very random and inadequate. In order to solve the mysteries of this singular nesting strategy and re-establish a sustainable population of the Oriental Pied Hornbills in Singapore, we embarked on a more scientific approach. For the next six years, we monitored up to five pairs of Oriental Pied Hornbills in their cavity nests and their surroundings during the breeding season (from December to May). Furthermore, we made a comparison of our data with two pairs of Oriental Pied Hornbills in captivity in Jurong Bird Park. Special mention must be made of two sites: (1) the Istana; (2) the Sungei Buloh Wetland Reserve. The celebrity pair in the Istana were Sada and Lili, and the pair in the Sungei Buloh Wetland Reserve were Bobby and Serene.

Through these five to six years (with the help of Hoo Chuan Lim and Alvin Tan), we improved the cameras and the sensors every year to monitor systematically and accurately the movements of the birds, the interactions between the individuals of the group; and identified diets, competitors for the cavity, and the predators of the chicks. With our “intelligent” nests, we gathered sufficient data to create the first growth analysis of the chicks, the amount of nest material and food supplied by the male. We were also able to monitor significant changes to the weight of the parents from the incubation of the eggs to the raising of the chicks. We further investigated the concentration of carbon dioxide and oxygen exchange between the cavity and the surrounding environment of the habitat, and discovered that there were fluctuations which could be correlated with moulting and chick activities.

The full nesting timeline of an Oriental Pied Hornbill was charted for the first time with information from the very beginning: from the male identifying the nest, courting the female, mating, supplying materials for the nest, the female sealing the nest, laying up to three eggs, moulting of her feathers, incubating the eggs, raising the chicks, educating the chicks, opening of the cavity, to teaching them the first flight. Also recorded for the first time was the “infanticide-cannibalism” of the weakest chick. During the same season, we equipped the male with a Global Positioning System (GPS) to understand the territory that he covers, the altitude, speed and frequency of flight. Knowing their behaviour and needs, we had a basic understanding of what the Oriental Pied Hornbills need to survive in Singapore. We also deduced the ecological role this species has in the habitat surrounding the nest, at least for half a year.

A computed tomography (CT) scan was also conducted to understand the muscular distribution and the anatomy structure.

We also initiated a DNA survey on the Oriented Pied Hornbill in the wild and in Jurong Bird Park to make accurate assessment on the genetic diversity to avoid cross breeding and strategise potential translocation.

The project resulted in two major “academic prints”: The first was a book, *Hornbills in the City*, which described the project’s re-introduction efforts and the chronology of events; and the second was an oil-painting of a pair of Oriental Pied Hornbills, by the late William T. Cooper (a renowned bird artist) who studied the birds in Pulau Ubin before he painted them. The book was published by NParks in 2012; and the painting, commissioned by SC Ng to commemorate the 5th International Hornbill Symposium in Singapore, is now exhibited in an In Vitro Fertilisation (IVF) Centre in Novena. In terms of scientific publications, the first report of our observation of infanticide-cannibalism in the Oriental Pied Hornbill was in the journal *Forktail* in 2007. The majority of the scientific reports from this project were published in the *Raffles Bulletin of Zoology* in Supplement 24 (30 March 2011), which were the proceedings of the 5th International Hornbill Conference held in Singapore from 22 to 25 March 2009.

The Singapore Hornbill Project (SHP) was the Winner of the Conservation and Research Award given by the 4th International Symposium on Breeding Birds in Captivity in 2007 and the SHP was selected by the International Union for Conserving Nature (IUCN) for its Global Re-introduction Perspectives: 2016.

The success of the re-introduction has been judged by the many complaints I have heard that the Oriental Pied Hornbill is now a nuisance!



This successful re-introduction illustrates that other large species, such as the Rhinoceros Hornbill and the Cream-Coloured Giant Squirrel, can be re-introduced provided the environment can be adjusted to enable survival of these re-introduced species. Such habitat “priming” will include successfully nurtured secondary forests. These large species are at the top of their respective food chains, and are usually used as an index for the health of the forests. They are usually elevated to icon status for the said forests. There are also other iconic species here in Singapore, such as the Smooth-coated Otter, the Leopard Cat and the Sunda Pangolin.

The Singapore Hornbill Project’s success can be highlighted as an ideal example of successful wildlife integration into a developed urban environment, and of successful shared living spaces with wildlife. This success is primarily due to a trilogy of good government policies, NPark’s involvement in consultation with relevant



Oriental Pied Hornbill in flight. (Photo credit: David Tan Siah Hin)

non-governmental organisations (NGOs), and a positive public. Special mention must be made of Mandai's integrative approach to educate the public with their exhibits, as well as behind-the-scenes work on outreach and research. The current interest in our wildlife bodes well for Singapore's future.



Ng Soon-Chye is a gynaecologist by profession, with sub-speciality in infertility. He was responsible for the first in-vitro fertilisation (“test-tube”) baby in Asia, delivered in 1983 in Singapore. He pioneered the technique of SUZI which is the precursor of the current micro-injection (ICSI) technique, with the world’s first delivery in 1989. He still practises at Novena Specialist Centre. He has a passion for nature, especially bird-watching, and since his younger days, has been involved with the Malayan Nature Society (Singapore branch) and now, the Nature Society (Singapore) (NSS). He did bird-ringing in the 1970s with David Wells, when the forests of Malaya were still pristine.

Marc Cremades is the Vice President and Team Lead for Attractions Development at the Mandai Wildlife Group. He is the founding member of the team, and is leading the conceptualisation and implementation of a new generation of wildlife parks in Singapore: Bird Paradise and Rainforest Park. He has over 30 years of experience in the study and management of conservation and breeding programmes for animals in Singapore, and across five continents. Many of these have been recognised with awards, and published in books, films and TV documentaries. Other notable projects include the creation of a Protected Natural Park in Madagascar and an Oscar nominee movie.