NATURE WATCH

Official Magazine of Nature Society (Singapore)

Volume 16 No 4 Oct-Dec 2008

Featuring:

Kinabatangan River
Birdwatching in Singapore
A Visit to Bolivia
Life and Death at Chek Jawa
A Musang family at home

NATURE SOCIETY
(SINGAPORE)

MICA (P) 085/08/2008

Message from Editor

It has now been over a year since the last issue of *Nature Watch* was published. That was Volume 16 No. 3 July-September 2008. Trixie Tan and Faizah Jamal were in charge of this issue as well as the previous issues 16/2 and 16/1, before that the editorial team was comprised of Trixie Tan and Andrew Tay.

In May 2009 I was offered to take over as editor by the NSS Executive Committee, just before the 55th Annual General Meeting. I accepted without hesitation. I have been involved in nature photography, writing, editing and publishing on and off since I was a teenager (see http://en.wikipedia.org/wiki/Morten_Strange for details); experience is an important prerequisite for doing something right and having fun.

Morten Strange announcing the results of the Singapore Bird Race 2008.
Photo: Sutari Supari.

I think nature is important and valuable and beautiful, and I think that those who try to conserve it and protect it are good people.

So with this issue we start with a new team: a new editor, a new designer and a new printer. However, I don't really think that there is much that I can do to improve *Nature Watch*. I believe the magazine already has an attractive lay-out, an interesting mix of articles and is well edited and produced. What I can do is improve the timelines of the production. Please note, that although the printed date of this issue is Oct-Dec 2008, information has been updated to current date.

But I cannot make progress on the production schedule without the help of the members. Nature Society (Singapore) is a society run by, for and with all the members; at *Nature Watch* we depend on members to help out if they possibly can. We have a wealth of gifted observers, researchers, writers, artists and photographers among our members, and I appeal to all of them to come forward and share their insight and their talent with the rest of us.

Morten Strange
Editor-in-chief
July 2009

Share with us

Your stories, articles, surveys, observations and brilliant photographs and send them to the address on page 1. If you are not sure, please send an e-mail to contact@nss.org.sg with a proposal and we will get back to you. Articles can be e-mailed across as a simple Word document (no funny fonts or colours or inserts, please) or saved on a CD and mailed with the illustrations as separate high res. files. Digital pictures must be in 300 dpi, absolutely sharp and as large as possible, jpeg compression is OK. Do NOT crop, brighten or sharpen, we will do all that as necessary. Thank you very much.

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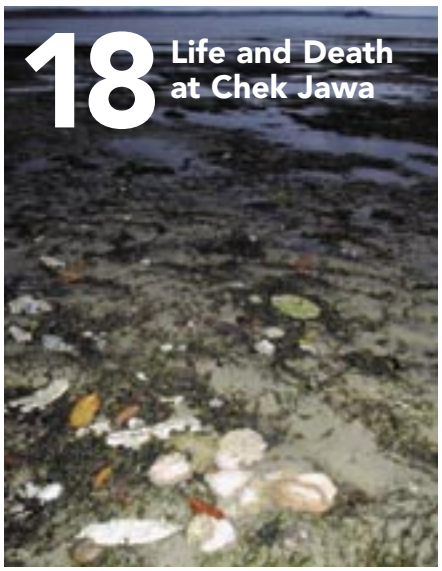

ON THE COVER With a baby clinging to its belly, a female Proboscis Monkey *Nasalis larvatus* looks for a place to roost along the Kinabatangan River.

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Birdwatching in Singapore – a historic review

Lim Kim Seng and the Nature Society (Singapore) have just published a new account of all the birds occurring in Singapore, *The Avifauna of Singapore*. To mark the event, here Kim Seng provides a detailed account of the historic background for our knowledge of today's birds in Singapore.

Photographs by **Jimmy Chew**

Ornithology arrived in Singapore together with the British forces in 1819. Stamford Raffles himself was a collector during his brief stay in Singapore and Sumatra between 1819 and 1822. His work was continued by Alfred Russel Wallace from 1854 to 1862 and H.R. Kelham, who collected assiduously during the 1880s. The turn of the century, 1889-1903, also saw collections by W.L. Abbott, who collected for the US National Museum.

In the first half of the 20th century, curators of the then Raffles (now National) Museum such as C. Boden-Kloss, Frederick Chasen, Carl Alexander Gibson-Hill and Michael Tweedie contributed to the bird collection by collecting themselves or sending native collectors scouring all over the island for birds. Much valuable information on birds was also published in the museum's very own *Raffles Museum Bulletin*. We owe much of our understanding of Singapore's British-era birdlife to these pioneers.

Field ornithology and recreational birdwatching however, started with the Singapore Natural History Society, which was formed in 1921. It organized regular field trips and indoor meetings, and published a bulletin called *Singapore Naturalist*. It was short-lived and became defunct a few years later. Two important publications during this period were Frederick Chasen's, *The Birds of Singapore Island*, Singapore's first bird checklist, published in 1923 and John Bucknill and Frederick Chasen's 1927 classic, *The Birds of Singapore Island*, Singapore's first bird book. That same year, H.C. Robinson, working in Peninsular Malaysia, published the first volume of his projected five-volume handbook on Malayan birds, *The Birds of the Malay Peninsula*, with the second volume a year later. Chasen completed the third volume in 1935, as Robinson died before he could complete Volume Three. Chasen completed Volume Four in 1939 but did not manage the fifth and final volume of this landmark handbook as he was killed during WWII.

Birdwatching then took back stage and was not revived untill after WWII. The Singapore Branch of the Malayan Nature Society (MNS) was founded in 1954. A famous birdwatcher of this post-war era was police officer Guy Madoc who wrote his *Introduction to Malayan Birds* while still a prisoner-of-war in Changi during WWII. His book was published by MNS in 1947 and reprinted in 1956. Carl Alexander Gibson-Hill also published a follow up to Chasen's 1923 checklist, our second country list and the first fully annotated version. Perhaps the best-known birdwatcher of this period was the philantrophist and bird photographer, Loke

One of the success stories of Singapore birds, the Asian Koel *Eudynamys scolopaceus* (here a female feeding on fruits) was just an uncommon winter visitor to Singapore in the 1980s; today it is a well-established resident all over the country, where its loud voice provides morning wake-up calls.

One of the highlights of the birding year 2008 was when this rare and globally threatened Nordmann's Greenshank Tringa guttifer turned up at Sungei Buloh after a 27 years absence from Singapore.

Singapore's most abundant bird is the introduced White-vented Myna *Acridotheres javanicus*.

The 1980s through to the end of the 1990s marked a period of phenomenal growth in interest in birding and nature-related recreation in Singapore. This was mainly the result of hard work from the MNS's very active Bird Group which increased its monthly birding trips to twice a month, initiated an annual bird race from 1984 and started involving members and the public in bird censuses from 1986.

Wan Tho, who attended the MNS's regular outings and helped to foster a keen interest in birds within the membership. He published his world famous collection of bird photographs in his 1958 book, *A Company of Birds*. Other important authors included Archibald Glenister who wrote his *The Birds of the Malay Peninsula, Singapore and Penang* in 1951 and Michael Tweedie who completed his *Common Malayan Birds* in 1960.

1963-1971 marked a brief period when MNS was also joined by the Royal Air Force Ornithological Society and the Army Birdwatching Club of Singapore-based British servicemen. They conducted extensive bird ringing studies in Singapore and southern Peninsular Malaysia for the Migratory and Pathological Studies Program or MAPS of the US Medical Corps under the leadership of H.E. McClure. The withdrawal of British forces from Singapore in 1972 ended their involvement in the Singapore birding scene.

From the early 1960s, Lord Medway, I.C.T. Nisbet and David Wells started publishing a series of annual bird reports from the region in the *Malayan Nature Journal*, thereby shifting leadership of studies on Malayan ornithology from Singapore to Kuala Lumpur. The annual report series ended with the publication of the 1987 report in 1990.

1968-1969 also saw the publication of two papers in *Ibis*, the journal of the British Ornithoogists' Union, by P. Ward on the avifauna of a Singapore garden and the breeding cycle of the Yellow-vented Bulbul. In 1973, Desmond Johnson published an update on birdlife in Singapore. Johnson's update, however, was not very accurate as he mentioned several erroneous records such as the occurrence of White-winged Duck *Cairina scutulata* and Great Tit *Parus major*, both of which have not been recorded by other authors.

Birding in the 1970s was a rather lonely affair with attendance at outings not more than ten, often less than five people including the leader. Many of the leaders were expatriate members working in Singapore, although a few like medical doctor Ng Soon Chye, were native born. Dr. Ng went on to become Chairperson of the MNS Singapore Branch's Bird Study Group and worked on bird ringing at the famed Serangoon Sewage Works. The publication of Ben King's classic *A Field Guide to the Birds of South-east Asia* in 1975 also helped to improve identification skills and spread the growth of birding in Singapore with its innovative and easy-to-use field marks, colour illustrations and concise descriptions. A year later, Lord Medway and David Wells completed the fifth volume of *The Birds of the Malay Peninsula* thus completing a project that started nearly half a century ago.

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In addition, the MNS also took on a more active role in conservation issues from the 1980s starting with unsuccessful appeals for the conservation of the regionally important coastal wetland of Serangoon and a coastal mangrove at Kranji, to the approval of a conservation plan for Sungei Buloh, now a fully-fledged wetland reserve. In 1994, a petition for the conservation of Senoko, a bird-rich wetland site, attracted over 25,000 signatures. Unfortunately, Senoko could not be saved as the government persisted with the development of the site for public housing. Membership of the MNS grew six fold from 300 in 1980 to over 2000 by 1999 with attendances at some official birding outings exceeding 150. By then, the MNS had changed its name to better reflect its objectives to Nature Society (Singapore) or NSS.

Membership of the MNS grew six fold from 300 in 1980 to over 2000 by 1999 with attendances at some official birding outings exceeding 150.

A sample of the people who contribute to our knowledge about Singapore avifauna.

1980-2000 also marked a period when the local birding literature was enhanced by a slew of bird books. Clive Briffett compiled MNS's *Pocket checklist of the birds of Singapore*, listing 284 species and then published his A Guide to Common Birds of Singapore in 1984. This was followed by Singapore's first annual bird report in 1986, edited by Christopher Hails who also published a book on the commoner birds, *Birds of Singapore* a year later. 1987 also saw the birth of *Singapore Avifauna*, the MNS Bird Group's birding newsletter. Undersigned authored Singapore's first bird red data book, *Vanishing birds of Singapore* in 1992. This was followed in 1994 by Briffett's *The Birds of Singapore*, an introductory text on commoner Singapore birds. 1997 marked the publication of Singapore's first field guide in Lim Kim Seng's

The most majestic of all, the White-bellied Sea Eagle *Haliaeetus leucogaster* is doing well here, with several breeding pairs each year both along the coast and near inland reservoirs.

Birds: An Illustrated Field Guide to the Birds of Singapore. There were also several photographic guides produced, the most noteworthy being Strange & Jeyarajasingam's *A Photographic Guide to the Birds of Peninsular Malaysia and Singapore* published in 1993. In 1998, the NSS Bird Group's first ornithological journal, *IORA*, was published. A year later, David Wells published the first volume of his two-volume handbook, *The Birds of the Thai-Malay Peninsula*, which focused on non-passerines. In 2000, Craig Robson updated King's 25-year old field guide with his own *Field Guide to the Birds of South-east Asia*, allowing birders in the region to keep up with the latest advances in field identification techniques. In 2007, Wells finally completed his second and final volume of *The Birds of the Thai-Malay Peninsula* and LK Wang and Chris Hails issued the first annotated checklist of Singapore birds in half a century. The following year (2008) marked the introduction of the first on-line editions of the now 23-year old *Singapore Avifauna*, rapidly enhancing the speed and access of information on the birds of Singapore to the technologically empowered public the world over.

The 21st century thus far has been marked by the advance of the use of the Internet and digital photography. Bird forums or lists have sprouted to enable birders of diverse abilities and interests to exchange the latest news and views. A typical birding forum would be WildbirdSingapore@yahoogroups.com, the e-forum of the NSS Bird Group. The advent of digiscoping, digital photography and handphones also enabled pictures of birds, some of them rarities, to be enjoyed, discussed and documented faster than previously, enabling keen birders to go after rarities with better precision and speed. Websites and blogs have also appeared in the last few years, giving birders a chance to share their pictures and experiences with compatriots, not just in Singapore but the world over.

Overall, the electronic age promises to make information sharing amongst birders much more efficient and enjoyable over the next 10 years than they have been over the last one hundred years.

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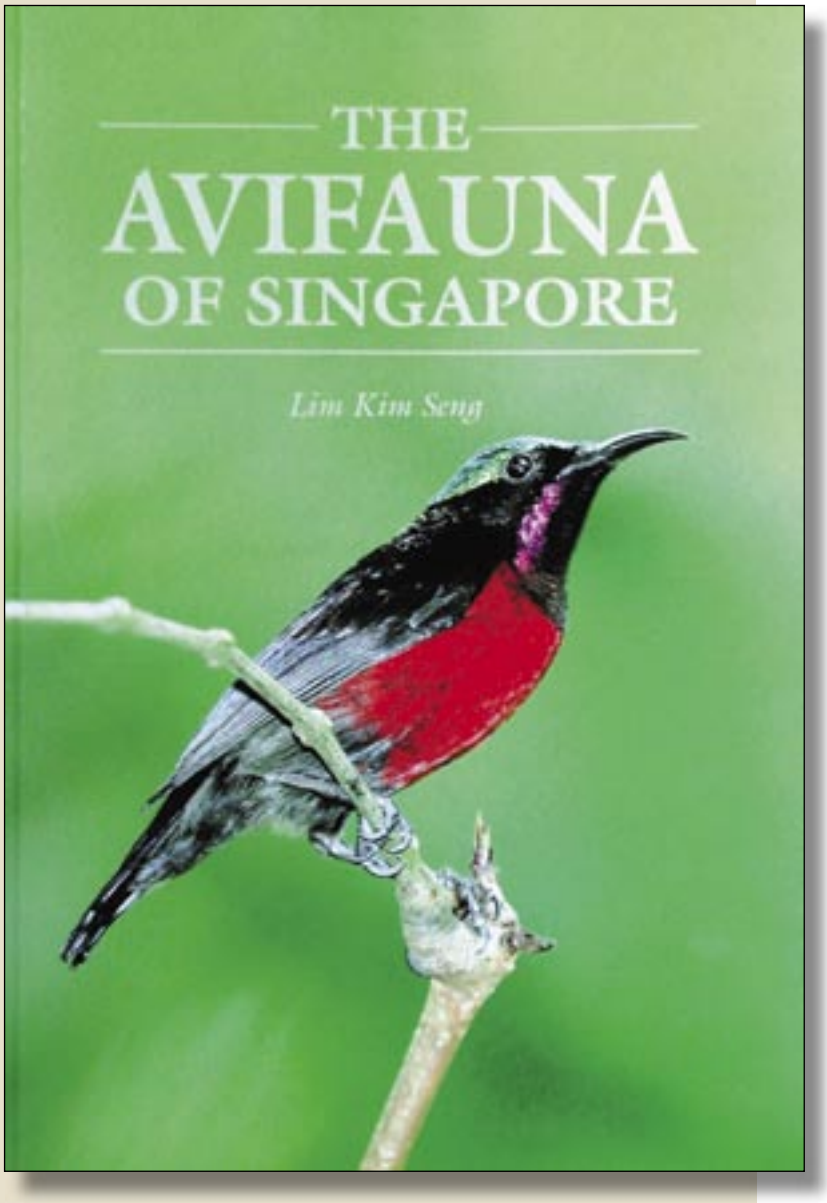
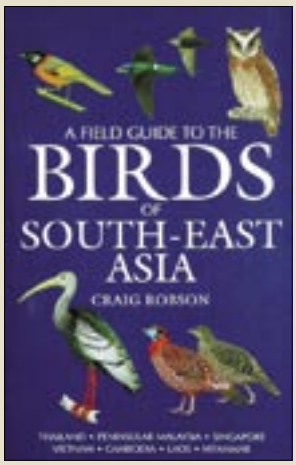
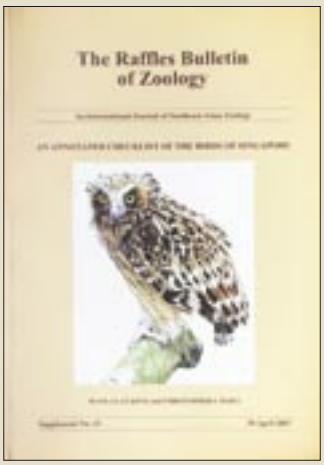
One country; three bird checklists

THE new book by Kim Seng, *The Avifauna of Singapore*, deals with every wild bird species known to have occurred in the country. The introductory sections cover habitats, geography, geology, climate, history of ornithology and conservation. The systematic review of the status of each species forms the bulk of the book, with detailed information on status, distribution, habitat preference, breeding seasonality, migration patterns, conservation and museum collections. It is illustrated with colour photographs of some of Singapore's most interesting species and bird habitats, and with black-and-white line drawings of selected species. This book represents an impressive amount of local ornithological research, and would be a valuable ornithological resource for South-east Asia in general and Singapore in particular.

Lim Kim Seng is well known to every nature enthusiast in Singapore. He has personally seen over 95% of Singapore's birds, and he is the author of numerous articles on birds and bird conservation. He has written three books on Singapore birds and three editions of the *Pocket Checklist of the Birds of Singapore*. He is also the editor of *Singapore Avifauna*, the ornithological bulletin of the Nature Society (Singapore)'s Bird Group, and the chairperson of its Bird Records Committee.







EDITOR'S NOTE: As mentioned by Lim Kim Seng, another excellent book about Singapore's bird life was published in 2007, *An Annotated Checklist of the Birds of Singapore* by Wang Luan Keng and Christopher Hails. It is Supplement No. 15 of *The Raffles Bulletin of Zoology*, published by the National University of Singapore. The much-used field identification bird guidebooks published by New Holland Publishers (UK) Ltd and authored by the British ornithologist Craig Robson base their treatment of Singapore records mainly on the unpublished *Checklist of birds of Singapore* (1998) by R. Subaraj. This means, that we in Singapore are blessed with no less than 3 authoritative and well-reserched, but different, bird checklists for the country.

The Red Leaf Monkey *Presbytis rubicunda* is endemic to the island of Borneo; notice the long, weak tail typical for this genus of primates.

Facing page: The Stork-billed Kingfisher in a dive.

Kinabatangan River

The Best of Borneo Wildlife

Since he first visited Kinabatangan River 10 years ago, Bjorn Olesen has been drawn to East Malaysia several times a year, to capture images of some of Borneo's picturesque and unique wildlife.

Text and photographs by **Bjorn Lynggaard Olesen**

KINABATANGAN RIVER starts its course deep in the mountainous interior of Sabah. From there it reaches the lowlands and winds across a rich mosaic of forests, swamps, and limestone outcrops covering one of Malaysia's largest floodplains. It is the second longest river in Malaysia; after a 560 km run, it empties into the Sulu Sea.

The Kinabatangan Wildlife Sanctuary lies within the vast floodplain of the Sungai Kinabatangan. At 270 square kilometres, the sanctuary is part of an important network of conservation areas in the lowlands of eastern Sabah. Some areas remain under water for long periods in the wet season, and oxbow lakes, formed by large meanders of the river that have been cut off from the main channel, are numerous.

It is not surprising, giving such varied habitats, that there is a bewildering abundance and diversity of wildlife. Among the primates that share the forest are Orang Utan, Proboscis Monkey, Silvered Leaf Monkey and the Red Leaf Monkey, endemic to Borneo.

During the drier months of the year (April to October) small groups of Borneo Pygmy Elephant (*Elephas maximus borneensis*) are fairly easy to spot around Kinabatangan; this part of Sabah is probably the best place in the world to get good views of the smallest elephant in the world. It was long believed that these animals were descendants from a captive population of Asian Elephants introduced to Borneo; only in 2003 did DNA analysis reveal them to be remnants of an isolated wild population that is now regarded as a distinct subspecies. With less than 1,000 individuals left in the wild, according to a wildlife study by WWF in 2007, this is the most endangered elephant taxon in the world.

Like in other parts of the elephant's range, shrinking forests have brought the animals into more frequent contact with

A safari on the river.

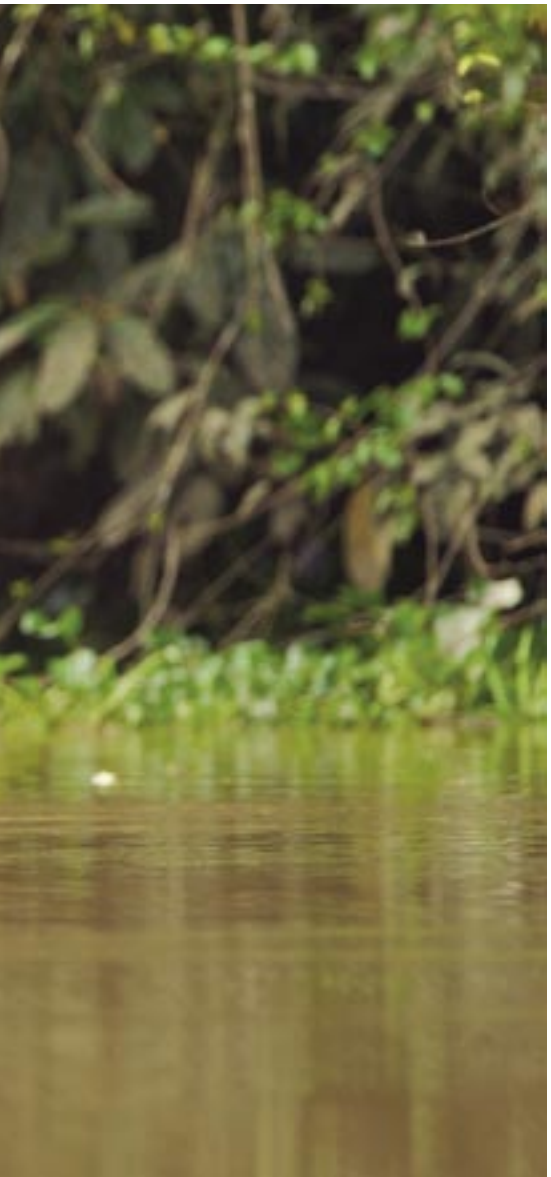
people. In April 2009 I watched 4 adult elephants cross the river in virtual darkness to invade a palm oil plantation to have a real good feed on young oil palm shoots - another stark reminder of the human-elephant conflict.

The best way to experience the beauty of Kinabatangan is by a river safari organized by one of the established companies around Sukau. The main flowering and fruiting season, from April to October is generally fairly dry, and a good time for spotting many birds and animals.

The most magical moments are at dawn, when the chorus of birds gives a very clear impression of the forest waking up for the day ahead. Hornbills are plentiful, often you can hear the unmistakable sound of hornbills in flight, their stiff wing feathers emitting a whooshing sound that can be heard at long distances.

Along the river look out for Oriental Darter, Storm's Stork, Stork-billed and Common Kingfishers; the Buffy Fish Owl comes out to hunt

The Stork-billed Kingfisher *Pelargopsis capensis* is abundant along the rivers on Borneo, this one got lucky after a dive into the mud.



The main flowering and fruiting season, from April to October is generally fairly dry, and a good time for spotting many birds and animals.

A rare sequence of two Colugos (or Flying Lemur) *Galeopterus variegatus* in a tender moment; studies tend to show that the larger grey animals are female, while the smaller rufous individuals are males, this situations seems to confirm it.

for frogs at night. Among the reptiles, Malayan Monitor Lizard and Saltwater Crocodile are both common.

Towards dusk, troops of Proboscis Monkeys begin to gather in the safety of riverside trees to prepare for sleep. This distinctive primate found only on Borneo is one of the star attractions of the river safari.

Nearby, the Gomantong Caves are quite close to the visitor lodges at Sukau. They are easily accessible by road, and definitely worth a visit, famous for their breeding populations of swiftlets. Like most other places in South-east Asia, local people here organize collections of used swiftlet nests for consumption.

Visitors to the caves will become immediately aware of a very strong smell of ammonia coming from the vast amounts of guano deposited by both swiftlets and bats. These deposits make the caves an ideal microhabitat for cockroaches and crickets.

Late afternoon is a good time to visit, when literary millions of bats leave the caves. On their way out, they are often ambushed by Bat Hawks or by Peregrine Falcons. The caves are within a forest reserve; look out for the Red Leaf Monkey, which occurs in this area, as well as various species of strictly nocturnal flying squirrels.

A period of intensive logging of Sabah's lowland rainforests reached its peak in the 1970s and 1980s. As the valuable hardwood trees began to be depleted, the development of oil palm

The White-crowned Hornbill *Berenicornis comatus* is an inconspicuous member of the hornbill family; it tends to move from tree to tree while staying inside the canopies, this is a rare glimpse of a male in the open.

If you count the bills of these roosting Bushy-crested Hornbills *Anorrhinus galeritus* there are five, if you count the tails, you will see that there are actually six in the group.

The Borneo race of the Black Magpie *Platysmurus leucopterus* aterrimus has all-black wings and a distinct crest showing well in this rare photograph of a shy, low-density forest bird.

The baby-faced Borneo Pygmy Elephant *Elephas maximus borneensis* comes out into the Kinabatangan River to cool off. The male only reaches a height of 2.5m compared to other Asia Elephants that grow up to 3 meters.

plantations on the cleared land picked up pace in the 1980s and 1990s. These changes along the lower Kinabatangan pose enormous challenges to the environment.

Working to maintain the balance between the wise use and protection of the Kinabatangan floodplain has been the aim of focused conservation efforts, where WWF Malaysia has done a good job. However, efforts to upgrade the sanctuary's conservation status to that of a National Park have met resistance from the logging industry and from local plantation owners who want to expand.

From my observations in the past 5 years, a reasonably balance has been achieved between development and conservation in the Kinabatangan River complex, and the quality wildlife is certainly still there to be watched and enjoyed.

GETTING THERE

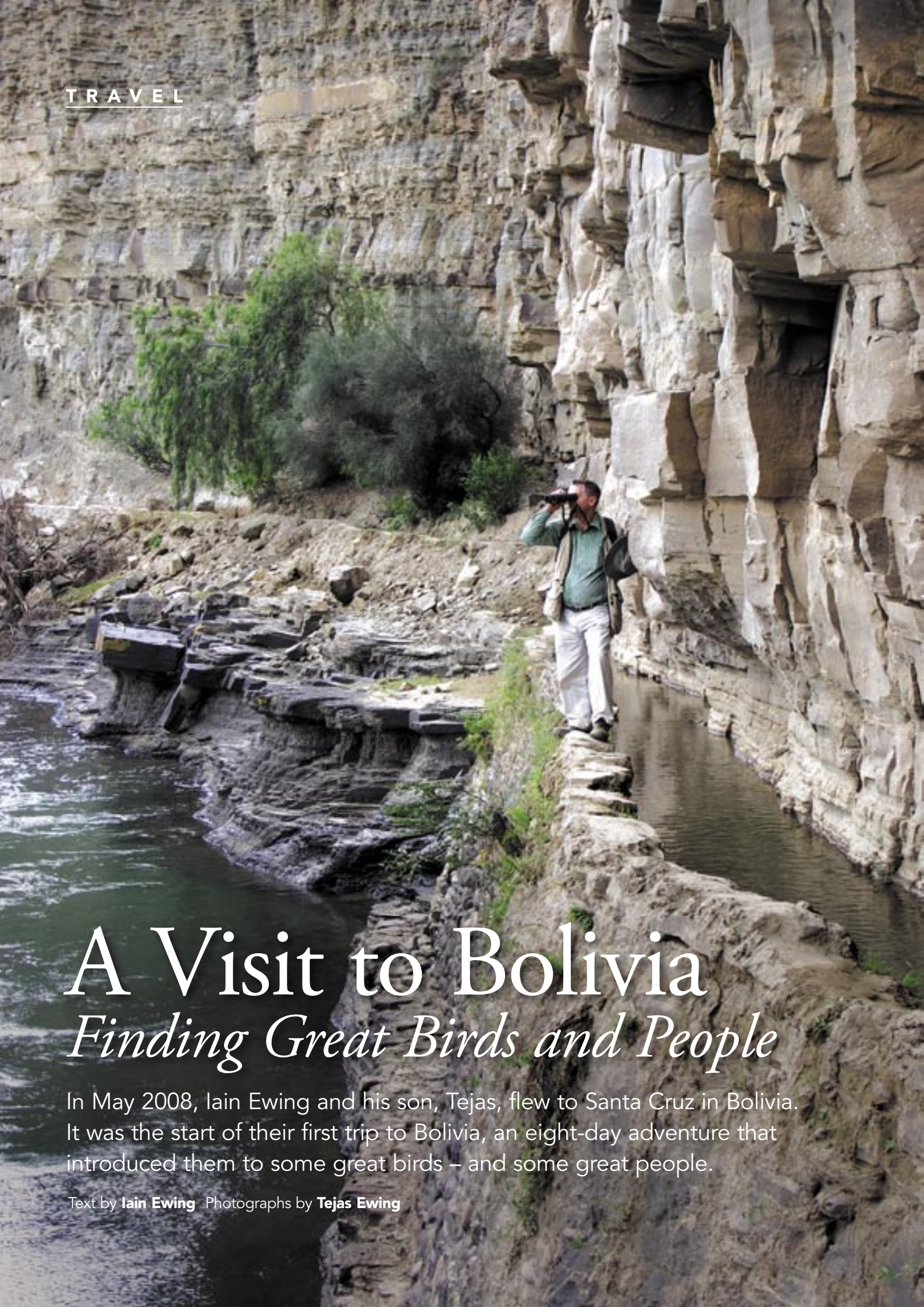
There are direct flights to Kuala Lumpur and Kota Kinabalu to Sandakan, the second-largest city in Sabah. Singapore residents need to go via Kota Kinabalu until the announced direct service Singapore–Sandakan starts, hopefully later in 2009.

From Sandakan it is a 2-3 hours overland drive to the small village of Sukau, where most of the Kinabatangan eco-lodges are situated. Some tour companies prefer to take clients from Sandakan by boat along the coast and upriver, which for first-time visitors is an exciting experience.

I normally stay at Sukau Tomanggong Riverview Lodge run by North Borneo Safari; they have some of the best guides in the area for birding and photography. The lodge consists of 10 very simple twin bedrooms, located on the banks of the river next to the local WWF office.

The climate in this part of Borneo is hot and humid by day and pleasantly cool by night; it is best to visit outside the rainy season which runs from November to February.

Bjorn Lynggaard Olesen *is a member of NSS and life member of MNS; he is a free-lance Wildlife Photographer, long-term resident in South-east Asia and Permanent Resident in Singapore. He supplies his images to publications and websites in the region.*



A Visit to Bolivia

Finding Great Birds and People

In May 2008, Iain Ewing and his son, Tejas, flew to Santa Cruz in Bolivia. It was the start of their first trip to Bolivia, an eight-day adventure that introduced them to some great birds – and some great people.

Text by **Iain Ewing** Photographs by **Tejas Ewing**

It all started when Siemens asked me to conduct a seminar in Sao Paulo, Brazil. It's not every day that I get the opportunity to go to South America on business, and, fortunately, Tejas was available to help me run the seminar. So we decided to make the most of our trip by fitting in some birdwatching. I went online, and found *Bird Bolivia*, which was started in 2006 by Ruth Alipaz and her Canadian husband, Bennett Hennessey. They suggested an itinerary just within the Santa Cruz province, and we took their advice to cut down on lengthy overland travel. After seeing the condition of the roads ourselves, we were certainly glad we did!

When we arrived in the city of Santa Cruz in the east of Bolivia, there to meet us were Ruth Alipaz, Sandro Valdez and Carlos Lijeron. Ruth was born in a village in the Amazon, in the far north of Bolivia. Her village, to this day, has no roads to the outside world, no electricity and no telephones. She is the first woman from her village to finish high school and go to university.

Carlos was our driver. He is from a village by the main highway from Santa Cruz to Sucre, and he safely got us from place to place in their excellent van. And, best of all, Ruth has recruited Sandro, from her village in the Amazon, to be the bird guide for her guests. Sandro describes himself as a "jungle man". The language that he and Ruth speak in their village is Quechua Tacana. His name in his own language is Santo Amutari. Santo means "son of a warrior". He is 29 years old, and he says that after walking in a city like Santa Cruz for one block, he is lost, but he can walk for days and weeks through the forest and never get lost. He told us that he was the best hunter in his village, and after "hunting" for birds with our binoculars with him, I believe him. In my experience, the best bird guides can not only see the birds, but they can also hear them. And in that respect, Sandro was amazing; the softest and most inconspicuous calls were all part of the orchestra of sounds surrounding us, and Sandro knew the name of every instrument.

He told us how he used to hunt every day, and so did the other people in his community, but now that their land is part of Madidi National Park, they have agreed among each other that each person will only hunt one animal per month. Sandro has a farm, and he is capable of supporting his family with its produce.

Our first stop was a very nice ecolodge at Lomas de Arena Municipal Park. In Spanish, *lomas* means dunes and *arena* means sand, and sand dunes are exactly what you can see. We arrived at 8.00 pm, and I looked around for a while for night birds. I was rewarded with good views of a Burrowing Owl, hawking for insects while perching on the grass. The next morning, after a 5 am breakfast, we drove to the dunes. Although the bird list for Lomas de Arena totals about 240 species, perhaps only 70 birds are resident. The others are Austral migrants, so you never know what will turn up. Our bird of the day was the Long-winged Harrier, *Circus buffoni*, named after Georges Louis Leclerc, Comte de Buffon.

I think it's interesting to remind ourselves occasionally that some of the birds we admire are named after some amazing people. To quote from the University of California Museum of Paleontology website: "It is not the average person who questions two thousand years of dogma, but that is what Buffon did: 100 years before Darwin, Buffon, in his *Histoire Naturelle*, a 44 volume encyclopedia describing everything known about the natural world, wrestled with the similarities of humans and apes and even talked about common ancestry of

Ruth has recruited Sandro to be the bird guide for her guests. Sandro describes himself as a "jungle man". He is 29 years old, and he says that after walking in a city like Santa Cruz for one block, he is lost, but he can walk for days and weeks through the forest and never get lost.

A beautiful cluster of Paphiopedalum Orchids along a stream; these little-known orchids are also referred to as Venus Slipper Orchids (inset).

Dramatic landscape near Los Volcanes.

Man and apes. Although Buffon believed in organic change, he did not provide a coherent mechanism for such changes. He thought that the environment acted directly on organisms through what he called 'organic particles'. Buffon also published *Les Epoques de la Nature* (1788) where he openly suggested that the planet was much older than the 6,000 years proclaimed by the church, and discussed concepts very similar to Charles Lyell's 'uniformitarianism' which were formulated 40 years later.

After an enjoyable morning of birdwatching at Lomas de Arena, at 9.00 am we started driving to the Red-fronted Macaw Lodge. Not only have Ruth and Bennett started *Bird Bolivia*, but they have also started *Armonia*, which is dedicated to the conservation of birds and their habitat in Bolivia. *Armonia* is a BirdLife International partner. Through Armonia, Ruth and Bennett have purchased a 50 hectare piece of land and created a natural reserve that protects the most important breeding area of the restricted-range Bolivian endemic, the Red-fronted Macaw, *Ara rubrogenys*. They have built the Red-fronted Macaw Lodge across the river from the huge red cliff where the macaws breed. Bennett describes the lodge as: "A true ecotourism effort, which helps protect a threatened Bolivian macaw, while all proceeds go to the local communities and the protection of the Red-fronted Macaw reserve."

Contrary to the name, Los Volcanes is not volcanic, but the softest sandstone I have ever felt, with the strength of a wet cookie. The rock crumbles in your bare hands.

And not only are there macaws, but we also had great views from the cliff face of Mitred Parakeets, Green-cheeked Parakeets, Blue-fronted Parrots, and Cliff Parakeets flying back and forth. In the desert scrub on the cliff, we saw the Bolivian Blackbird, which is endemic to the dry valleys of Bolivia. The area is frequently visited by Andean Condors, and one day we had spectacular views of no fewer than six condors soaring past the cliff and up into the blue sky.

After three wonderful days at the Red-fronted Macaw Lodge, Carlos drove us to Los Volcanes. Contrary to the name, it is not volcanic, but the softest sandstone I have ever felt, with the strength of a wet cookie. The rock crumbles in your bare hands. It took eight men three years to build by hand the road into the Volcanes Lodge. The only source of power is a small hydro-electric turbine and canisters of gas that come in with the guests.

The flora is amazing, with a wide variety of bromeliads and orchids, and the birds are equally astonishing. We had fabulous views of Sunbittern, Military Macaw, Chestnut-tipped Toucanet, Red-necked Woodpecker, Ocellated Woodcreeper and Saffron-billed Sparrow, among many others.

Our last afternoon was spent bird-watching around the Botanical Garden in Santa Cruz, where we had some great

views of a male Black Howler Monkey, as well as the Black-backed Water-Tyrant and the gorgeous Yellow-tufted Woodpecker.

On our final night, Carlos, Sandro, Tejas and I met Ruth and Bennett for a delicious meal of Bolivian specialties at one of the most popular restaurants in Santa Cruz. Over dinner, Ruth and Bennett told us how they had met when they were working together on an environmental project in La Paz. As the relationship developed, and Ruth told her family that she was going to marry Bennett, they said to her, "They never stay." Many foreign men come to Bolivia, make big plans, marry a Bolivian girl, and, when things don't go so well, they leave Bolivia, and leave the girl. But Bennett has stayed – so far for 17 years.

The dinner was a memorable end to a memorable trip, with 56 lifers out of a total of 192 species seen. Tejas and I are looking forward to another trip soon, when Ruth and *Bird Bolivia* will organize an itinerary that will include their new lodge, which will be protecting a breeding site of the endemic Blue-throated Macaw.

The lodge at Los Volcanes.

The red-fronted Macaw Lodge.

TRAVEL NOTES

You can contact Bird Bolivia at: www.birdbolivia.com. Ruth Alipaz will help you plan your itinerary, and she can offer at least 5 different itineraries within Bolivia, including Madidi National Park, which has one of the greatest degrees of bio-diversity of any park on earth. We flew from Sao Paulo in Brazil to Santa Cruz in Bolivia on AeroSur. The flight was a pleasant two and a half hours, and, once in Bolivia, the only thing we had to pay for was our beer. The price we paid for our 8-day trip, US$4,000, covered everything for two people, and I mean everything. For example the van that we traveled in, with reclining seats, was the most comfortable that we have ever been in.

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Tejas Ewing with a bromeliad.

Life and Death at Chek Jawa

Text and photographs by **Loh Kok Sheng**

Chek Jawa is a rare jewel in the the eastern coast of Pulau Ubin, an offshore island northeast of Singapore, its coastal habitat encompasses six rare ecosystems. This unique intidal environment narrowly escaped destruction by reclamation, but now is plagued by a mysterious mass die-off of its residents. Loh Kok Sheng gives some insights as to what might have happened. A last-minute rescue of Chek Jawa...

I can still recall the moments of trepidation that had nature lovers at the edge of their seats, just before it was announced that Chek Jawa would be deferred from reclamation. The statement was made at the very last minute, and brought to close weeks of desperate rallying for public support. With more than 1,000 people visiting this intertidal flat on a single day, Chek Jawa set a precedence in Singapore to be the first nature site to receive so much attention. Indeed, with its high biodiversity and six ecosystems, Chek Jawa has earned a special place in the hearts of many Singaporeans (*Figure 1*).

Figure 1. Chek Jawa is lauded for its high biodiversity with six distinct ecosystems (clockwise from top left: coral rubble, sandy shore, seagrass lagoon and mangrove). The other two ecosystems are coastal hill forest and rocky shore. Photograph credits: Ria Tan (www.wildsingapore.com) and N. Sivasothi.

Mass die off-January 2007

The high profile success story of saving a piece of nature was eventually followed by years of peaceful conservation. Unfortunately, nobody could have predicted a mass die-off that would vastly change the once densely populated landscape of Chek Jawa.

What happened after a period of exceptional high rainfall in January 2007 marked the beginning of any nature volunteer's nightmare. We discovered a large range of distressed or already dead marine animals (*Figure 2*). As the smell of death permeated the air, the scene was heartbreaking to witness.

Prominent marine animals such as carpet anemones (*Stichodactyla haddoni*) looked distorted, bloated, or had already disintegrated into many pieces. Ball sea cucumbers (*Phyllophorus* sp.) that usually burrow under the sand had surfaced looking like deflated ping pong balls. It was the first time we could see so many sea cucumbers above the sandbar-but they were all dead. Even the magnificent knobbly sea stars (*Protoreaster nodosus*) were not spared-the dead and decaying were strewn across the shore (*Figure 3*).

Figure 2. Mass die-off at Chek Jawa in January 2007 where many dead and dying bodies of marine animals were strewn over the intertidal flat. Photograph credit: Ria Tan

Lim (1984) revealed in his hydrological study that the waters surrounding Chek Jawa are seasonally subjected to salinity depressions due to freshwater flooding from Johor River, especially during the monsoon months of December and January.

What exactly caused the mass die-off?

Among the various questions raised, the most frequent was 'what caused the mass die-off?' Many nature enthusiasts believed it had to do with the heavy rains and flooding events that took place immediately before. Lim (1984) revealed in his hydrological study that the waters surrounding Chek Jawa are seasonally subjected to salinity depressions due to freshwater flooding from Johor River, especially during the monsoon months of December and January.

Around 17-20 December 2006 and 11-14 January 2007, freshwater input was particularly intense. Many flooding events occurred in different parts of Malaysia and Singapore with reports of widespread damage and disruption.

Cumulative rainfall level showed a surge of 350 mm for each of those

Figure 3. Clockwise from top left, dying carpet anemones, sponges and echinoderms in January 2007. Photograph credits: Ria Tan and Ron Yeo

months. The Johor River water level heights for 18-20 December 2006 described a regular fluctuation which corresponded to low and high tides; but on 19 December the water rose steeply up to a very high level of 6.57 metres, and possibly higher by 21 December 2006. Although river water level data were not available for January 2007, a similar rise probably occurred, corresponding to another rainfall surge of 350 mm in that month.

Dr Wong Poh Poh, an expert in coastal geomorphology with the Department of Geography, National University of Singapore, suggested that land reclamation at western Pulau Tekong could have narrowed the channel of the Johor Straits, leading to an increase in velocity towards the direction of Chek Jawa. Hajisamae and Chou (2003) and Koh and Lee (2006) stated in their studies that Johor Straits is lined with man-made coastal modifications, with South Johor increasingly urbanised to cater for a rapidly growing population. These changes could have caused faster runoff of freshwater into the straits, thus amplifying the intensity of salinity reduction during monsoon periods.

The evidence suggests that the mass die-off was related to the heavy rainfall in December 2006 and January 2007. The next question is whether salinity per se was the key factor that led to such a huge number of deaths?

It is possible that other factors potentially associated with flooding, such as algal blooms, changes in sea surface temperature, pollutants, disease or the lack of oxygen were responsible. Dr Dan Rittschof, Professor of Zoology from Duke University, USA, noted that the mass die-off affected mostly soft bodied animals that are unable to tolerate large salinity fluctuations due to the greater permeability of their tissues.

Because marine creatures require saline conditions to maintain their osmotic pressure, an extreme decrease in salinity will offset their osmotic balance leading to stress and, eventually, death. Animals such as crabs, periwinkles and drills are physiologically better adapted to salinity changes, and this may explain why they survived. Salinity readings taken during that period revealed that the levels in the eastern Johor Straits were about six parts per thousand (ppt), almost five times less than the normal salinity levels of the Johor Straits.

Figure 4. The sandbar once hosted several carpet anemones, as indicated by the white arrows. After the mass die-off, no carpet anemones could be found. These pre and post-mortality photographs were used to compare differences, such as recruitment rates, over time.

The recovery

Prior to the major flood of 2007, many different varieties of exotic and common marine creatures were easily sighted by visitors of Chek Jawa. So what was Chek Jawa like after the mass die-off? I joined Dr Rittschof, Mr Sivasothi and Dr Peter Todd to investigate the state of Chek Jawa post-January 2007 and to monitor the recovery from May 2007. As part of my undergraduate project with National University of Singapore, my volunteer friends and I carried out extensive surveys to determine species diversity and abundance and recruitment patterns.

Our transect surveys did not reveal any distinct recovery trends, except for an increasing abundance of tubeworms over time. Therefore, we conducted finer-scale studies on specifically targeted marine fauna to obtain a better picture of recovery of Chek Jawa (*Figure 4*).

A previous study headed by Joseph Lai, the first person to bring Chek Jawa to the public notice, indicated that carpet anemones were once abundant. He recorded an average of 112 carpet anemones ranging up to 40 cm in diameter along the transect belt studied. However, when these transects were replicated after the mass die-off, only six medium sized (~15 to 19 cm in diameter) carpet anemones were found.

Pre- and post-mortality photographs of Chek Jawa groundscapes were also analysed. Post-mortality photographs revealed a lower abundance of anemones at the sand bar, where they used to be found littered all over like sand mines. According to

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an anemone expert, Dr Daphne Fautin from the Division of Biological Sciences, University of Kansas, USA, carpet anemones can live for several centuries. With such a long lifespan, the time taken to re-build their population is also very long. Furthermore, the remaining few adult carpet anemones would possibly invest more energy into recovery and survival than reproduction.

How about the peacock anemones (Order Ceriantharia)? A drop in their abundance was also observed by Dr Rittschof after the mass die-off. When they were surveyed between October 2007-2008, an increase in the average number of peacock anemones was recorded within the transect set up to monitor their abundance and sizes (*Figure 5*).

Of all the echinoderms formerly common at Chek Jawa, cake sand dollars (*Arachnoides placenta*) and sand stars (*Astropecten sp*.) are the only two that

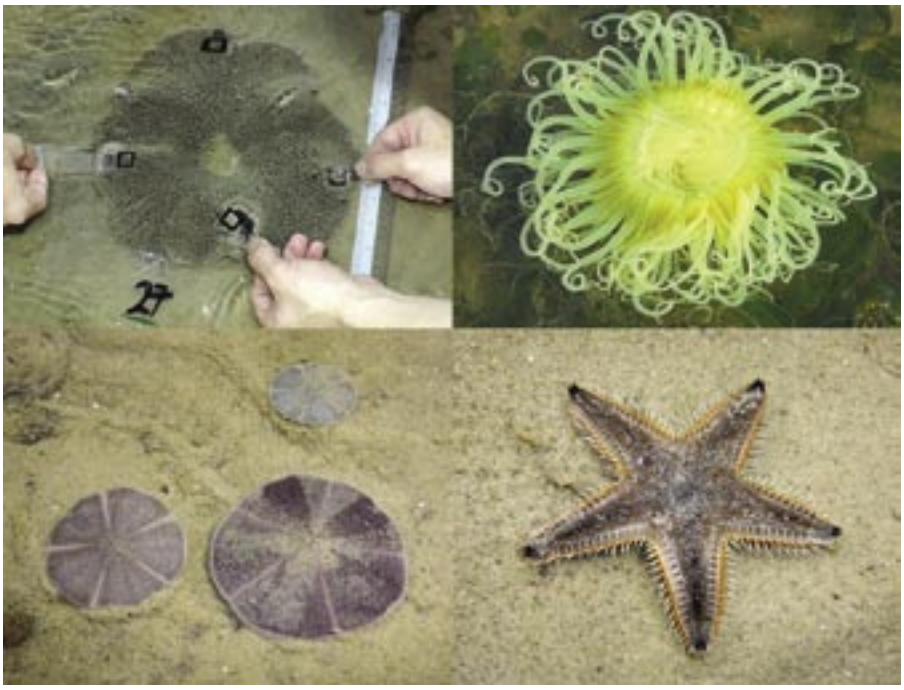

Figure 5. Marine animals surveyed: Clockwise from top left, carpet anemone, peacock anemone, sand star and sand dollars.

Figure 6. Large areas of the intertidal flat were colonised by mounds of asian date mussel beds. Circled is one of the many large black patches of the mussel bed mounds.

Figure 7. The one-centimeter long asian date mussel is a successful invasive species.

The majority of the new Chek Jawa residents are generally juvenile forms or small-sized suggesting recruitment rather than migration. The shores within the vicinity of Chek Jawa (ie Changi Beach and Pulau Sekudu) could have helped enhance larval recruitment to reseed Chek Jawa because these shores were less impacted by the freshwater surges.

remain abundant after the mass die-off and we recorded high densities across all size classes. Nonetheless, the population of the common sea star (*Archaster typicus*) seemed to have dropped dramatically. They were mostly seen disintegrating during the mass die-off and were not sighted for the following 11 months. Once found in large numbers, only five common sea stars could be located at the low-water level mark of the sand bar during a survey in December 2007. Thankfully, all is not lost, as the team found more than 20 in January 2008.

The invader-friend or foe?

During June 2007, we observed a peculiar phenomenon which has never been recorded in Chek Jawa before! Several large mounds of asian date mussels (*Musculista senhousia*) had colonised a large area of the seagrass lagoon and sand bar. These opportunistic creatures possibly require significant disturbances, such a big mortality event, during which there is low inter-species competition that facilitates successful invasion (*Figure 6, 7*).

Although each individual mussel is no bigger than a fingernail, collectively, they can impact Chek Jawa in various ways. Not only will the mussel beds be able to dominate and exclude native species by aggregating in large numbers, they can also restrict growth of seagrass at the lagoon. Although it might seem like these mussels are the enemy, the byssal mats do in fact provide additional habitat for other species such as snails to settle on.

A bi-monthly study to measure the area covered by mussel beds showed a peak in December 2007 and a subsequent decline in January 2008. By August 2008, we could not find any living mussels at all. Such a disappearance of the once extensive mussel population suggests the possibility that with the recovery of Chek Jawa is in progress. Preliminary diet studies of sand stars from Changi suggest that they feed on the mussels, and this could account for their decrease in abundance.

What is the future for Chek Jawa?

After more than two years, Chek Jawa appears to be recovering slowly and steadily from the mass die-off. Even though the abundance of certain species such as sand dollars and sand stars are almost as high as before, species like the carpet anemones presently only represent ~10% of their previous abundance.

The majority of the new Chek Jawa residents are generally juvenile forms or small-sized suggesting recruitment rather than migration. The shores within the vicinity of Chek Jawa (ie Changi Beach and Pulau Sekudu) could have helped enhance larval recruitment to reseed Chek Jawa because these shores were less impacted by the freshwater surges. Indeed, the presence of the young of various species at Chek Jawa reflects something to be cheerful about (*Figure 8*).

Chek Jawa is now a designated protected area and hopefully this will enhance natural recovery. Our surveys provide some insights into the mass die-off in Chek Jawa, as well as the stability and fragility of the ecosystems represented there. This is not the end of Chek Jawa's story. As I continue my monitoring and studies of Chek Jawa, I hope to witness the return to its previous high diversity and abundance of charismatic marine creatures. The mass die-off of marine life at Chek Jawa emphasises the vulnerability of intertidal systems and the need to protect what is left of our shores.

Figure 8. Marine life that can still be found at Chek Jawa.

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Loh Kok Sheng *is a graduate from NUS, majoring in Life Sciences with specialization in Biology. Kok Sheng has great interests in ecological work and did a research project aimed at studying the mass mortality and recruitment of macrofauna at Chek Jawa which generated important media attention. Kok Sheng is also a volunteer and busy blogger with various nature blogspots.*

A Musang family at home

Text by **Vilma D'Rozario** Photos by **Chan Kwok Wai**

For the last several years, generations of Common Palm Civet have been part of my family, living in the roof spaces of my home. I live in an old bungalow off Upper East Coast Road which my parents built in 1958. My neighbours and I have chiku, cherry and mango trees in our gardens, the fruits of which the civets love.

Thanks to Chan Kwok Wai, a keen wildlife photographer and active member of the Vertebrate Study Group (VSG), photos of a family of civets which shared my home in Oct 2007 were taken. This brief article shares three photos and some general information on civets.

The Common Palm Civet or Musang in Malay (*Paradoxurus hermaphroditus*) is a native of Singapore – a largely nocturnal and arboreal mammal which inhabits forests, scrubland, parkland, mangroves and even urban areas where there are mature gardens with fruiting trees and suitable roof spaces to roost in and raise their young.

Recognized by a black band across its eyes and the side of its muzzle, a whitish forehead, cheeks and front part of its muzzle, this medium-sized mammal seems to look as though it is wearing a black mask. Its body is dark greyish-brown, patterned with dark broken lines down its back and black spots on its side. It measures on average 59cm (head and body) and has a long tail of up to 53.5cm in length (Baker & Lim, 2008).

Common Palm Civets are omnivorous. At my house, they have been observed to eat chiku and cherries. They have been known to eat insects, lizards, and eggs. I have seen insect parts in their poo, which they leave on the roof of my house. Also called "toddy cats", these mammals have been observed to seem to enjoy eating the young flowers of sago palms, the sap of which, when fermented, makes the alcoholic toddy drink.

Except for females with young kittens, Common Palm Civets are known to be solitary. I have on occasion seen lone civets at my place, and on several occasions have had mother civets and their babies living in my roof. The photos in this article show a mother civet with her two kittens.

EDITOR'S NOTE: This female appears to suffer from cataract in her left eye; could her partial blindness explain why she prefers to breed in an urbanized environment?

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