MISCELLANY

Environmentally friendly mariculture - challenges of marine fish culture in Mainland China

by Liu Min

Mariculture production in Mainland China, inclusive of fishes, crustaceans, molluscs and seaweeds, has rapidly increased over the last two decades (Fig. 1). To date, more than 50 marine fish species from over 20 families are cultured, mainly in earthen ponds (Fig. 2) and inshore (shallow coastal water) floating cages (Hong & Zhang, 2003) (Figs. 3 & 4); offshore (deep water) submersible cages have recently been developed (Chen Jiaxin, unpublished data) (Fig. 5).

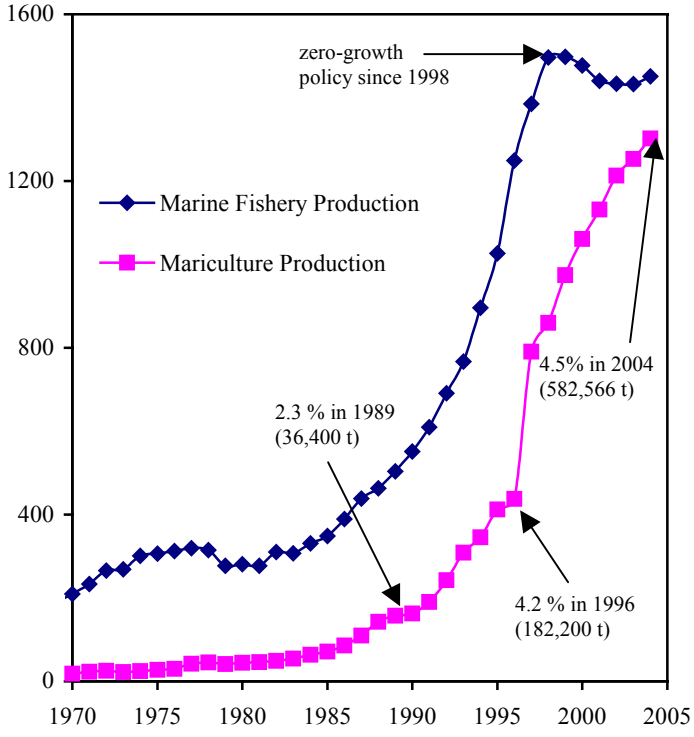

Fig. 1. Estimated annual marine production (including marine fishery and mariculture) (× 10,000 t) in Mainland China between 1970 and 2004, showing marine fish culture production by year (percentages are grow out rates) (http://www.lib.noaa.gov/china/aquaculture)
(Chen Jiaxin & Wong Jiangyong, unpublished data).

Here I do not intend to look into this industry in great detail. Instead, I discuss several of the problems that the marine fish culture industry in Mainland China faces. From both biological and ecological perspectives, these problems cannot be ignored, and greater focus is needed on a more environmentally friendly approach to mariculture. Major issues are the practice of grow-out of wild-caught fish (therefore continued exploitation of wild populations), alien species introductions, loss of genetic diversity and pollution from mariculture operations. Since pollution aspects associated with mariculture are well-known in the region (Yang *et al*., 2004), I will focus only on the first three issues.

Fig. 2. Earthen ponds for grouper and snapper culture in Lingshui (Hainan Province). The investment is relatively low. Fish culture is divided into certain stages, e.g. juvenile culture (from new-hatched larvae to about 5-10 cm TL), grow-out culture (from about 5-10 to 20 cm TL, <500 g), and market size culture (from <500 g to market size). Farmers only focus on one of these stages.

Fig. 3. Crowded inshore floating cages mainly for large yellow croaker (*Larimichthys* =[*Pseudosciaena*] *crocea*) culture in Ningde (Fujian Province). The culture production of this species from the Province contributed to more than 80% of the total national culture production of the species. In 2004, there were more than one million floating cages in Mainland China, with more than 50% in Fujian Province (Chen Jiaxin, unpublished data). (Photo: Prof. Chen Jiaxin).

Of more than 50 marine fish species cultured in Mainland China, only about 10 have achieved hatchery-based mariculture (i.e. both broodstock and cultured fish are from captive breeding) (Hong & Zhang, 2003); for the majority, wild-caught juveniles are the main source of grow-out culturing. The activity of 'growing-out' wild-caught fish in captivity is not relevant for addressing overfishing because it does not necessarily reduce fishing pressure on wild stocks of

Fig. 4. Inshore floating cages for multiple fish species cultured in a Hong Kong mariculture zone. The marine fish culture industry in Hong Kong faces similar problems to Mainland China and elsewhere, such as water pollution and diseases. Meanwhile, high operation investment in Hong Kong makes cultured fish prices higher than those in Mainland China, and less competitive (Chan 2005).

these species (Sadovy, 2001). For instance, for the Hong Kong grouper (*Epinephelus akaara*) (Fig. 6), listed as 'endangered' on the IUCN Red List in 2003 and the most expensive grouper in Hong Kong's live food fish market today, captive breeding has never been successful on a large scale since first attempted in the 1960s. The mariculture production of this species is still mainly from 'growing-out' wild-caught juveniles (Wang Hansheng, personal communication). Shortage of governmental financial support for biological and ecological studies, and with lack of management, its fishing condition and biological status have little chance to improve. Information on its spawning behaviour in the wild, spatial and temporal movement patterns and habitat use throughout its life cycle, population size, landing volumes and catch per unit effort are needed for carrying out management initiatives. Such information, in turn, can also provide guidelines to improve captive breeding techniques (Liu & Sadovy, 2006).

Fig. 5. Offshore submergible cages for cobia (*Rachycentron canadum*) and Greater amberjack (*Seriola dumerili*) culture in Nanao (Guangdong Province). These cages can be submerged when typhoons or red tides come.

Fig. 6. The Hong Kong grouper (*Epinephelus akaara*)

Second, there is no sufficient and effective management of alien fish species introductions in Mainland China, in general. Shandong Province, as one example, has introduced about 30 fish species (both marine and freshwater) for mariculture purposes over the last decade (Liu *et al.,* 2003). However, most of the species fail to establish themselves in culture operations in the region, mainly because of insufficient evaluation of the species before introductions, and because there is no effective management to maintain good economic characteristics following introduction. For instance, the turbot [*Psetta maxima* (= *Scophthalmus maximus*)] has to be repeatedly introduced from Europe due to the rapid loss of its 'good' characteristics (e.g. flesh quality, high growth rate) after one or two generations of captive breeding, which result in 'bad' characteristics (e.g. early maturation and albinism) (Liu *et al.,* 2003). For relatively successful species, current management is also not enough. For instance, the red drum (*Sciaenops ocellatus*), introduced from the United State in the mid-1990s, has had more than 10 million juveniles produced annually (Hong & Zhang, 2003), and the estimated mariculture production was about 43,500 tonnes (about 7.5% of the total marine fish culture production) in 2003 (Zhou & Wang, 2004). Considering its adaptability, the possibility of the species establishing itself in the wild with unknown consequences cannot be ignored (Sadovy, 2000) (Fig. 7). In another case, an introduced fish species, the redtail catfish (*Phractocephalus hemiolioterus*), was caught from the Pearl River Estuary (Fig. 8). Using closed systems and sterile individuals for culturing introduced fish species should be considered.

Third, apparent losses of characteristics considered to be of economic value (e.g. flesh quality, high growth rate and disease assistance) and genetic diversity in maricultured fish species, are not uncommon. For instance, cultured individuals of the large yellow croaker *Larimichthyes* (= *Pseudosciaena*) *crocea*, after several generations in captivity, mature at younger age and smaller size, and have slower growth rates and lower genetic diversity than wild-caught individuals (Liu & Sadovy, unpublished manuscript). It is also noted that the genetic diversity of its wild stocks is particularly low. There are at least three possible explanations. First, this species was heavily exploited at its spawning and over-wintering aggregations between the 1950s and 1970s with almost no

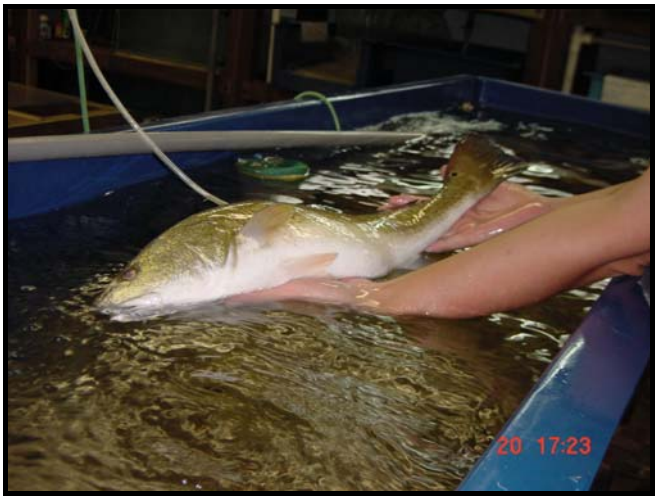

Fig. 7. An individual of the red drum (*Sciaenops ocellatus*) was caught in the bay of the Swire Institute of Marine Science (SWIMS) on 20/06/06. The culture scale of this exotic species in southern Mainland China is large; the individual could have escaped from fishing vessels during transport or from floating cages or even intentional releases.

fishery management. Its fishery collapsed in the 1980s. Since then its spawning aggregations have never reappeared. Second, captive breeding started, following over-exploitation, by using only small number of broodstock from the wild and then a small number of broodstock was taken from captive-bred individuals. This may reduce the genetic diversity of the species after several generations in captivity. Third, large-scale and long-term restocking programmes in the last decade in the East China Sea, the major source area for this species, by restocking captive-bred juveniles with low genetic diversity, may further contaminate the gene pools of its wild stocks. The case of the large yellow croaker sends a clear message of the importance of maintaining genetic variation, conserving biodiversity, and of timely, sufficient and effective management.

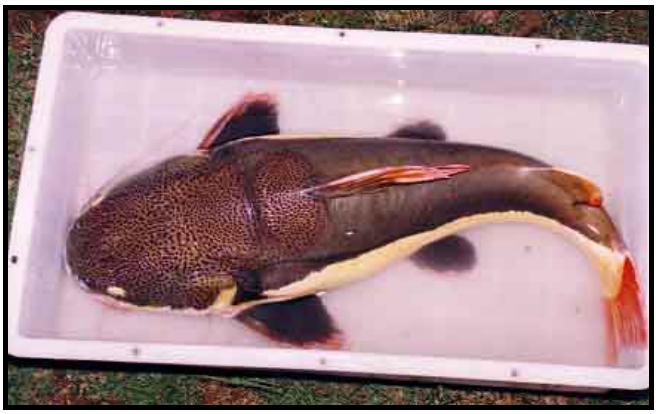

Fig. 8. The redtail catfish (*Phractocephalus hemiolioterus*), a freshwater fish that naturally occurs only in South America. This species was introduced into Mainland China in the late-1990s for public aquarium exhibition. An individual was caught from the Pearl River Estuary in 2001.

To date, offshore submersible cage culture (Fig. 5) is considered to be one of the environmentally friendly mariculture modes in Mainland China, and has been promoted by fishery departments through financial support to investment companies. The economic benefits reported relate to high survival and grow rates, and, presumably, reduced pollution risks for inshore waters. Because of the high cash input necessary for the submersible cage culture industry, most traditional, inshore, small-scale, floating cage culture farmers cannot become involved (Fig. 9). Therefore, inshore cage culture operations, have little prospect of becoming reduced or abandoned, at least in short term, and the associated environmental problems in inshore waters will not be improved or become solved (Fig. 10). Developing offshore cage culture should be planned together with reducing inshore culture scales to achieve the ideal plan for environmentally friendly mariculture.

Fig. 9. Meeting with farmers in Nanao (Guangdong Province), to discuss the future of mariculture development.

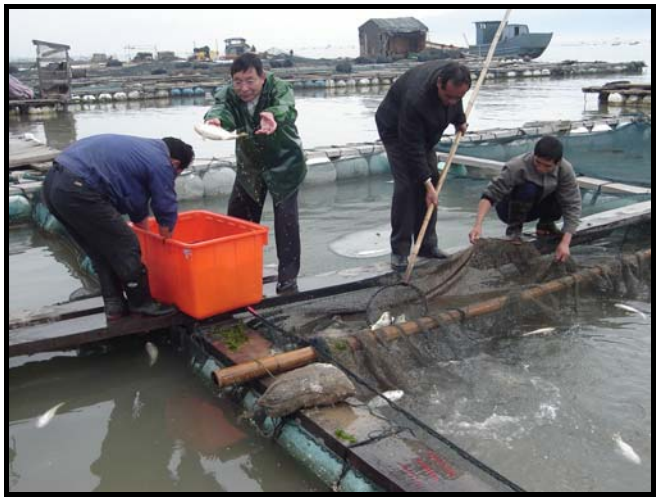

Fig. 10. High fish mortality in inshore floating cages when disease breaks out. (Photo: Prof. Chen Jiaxin).

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Note: On 7-11 March 2006, a workshop on the responsible development of mariculture in the Asia-Pacific region was organized by the Food & Agriculture Organization of the United Unions (FAO) and the Network of Aquaculture Centre in Asia-Pacific (NACA). More information about marine fish culture in the Asia-Pacific region is available from http://www.enaca.org/marinefish.

Environmental Life Science Society activity review

by Executive committee of ELSS
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The Environmental Life Science Society (ELSS) is going through its second session since establishment in 2005. During our first six months, the new executive committee was created and various activities were organized. For example, the Super-Pass Dinner, an Eco-tour to Mai Po, an Inauguration Ceremony, a Careers Workshop, a Photo Taking Competition and Exhibition, and the ELSS Football Competition. Let us briefly introduce two of our activities: the Eco-tour to Mai Po and Careers Workshop.

ELSS aims to promote the study of Environmental Life Science and arouse interest in ecology and environmental protection; hence we organized a tour to Mai Po for our members on 6 January 2006 (Figs. 1 & 2). We were grateful to have Dr. Billy Hau, Mr. Yu Yat Tung and several postgraduates as our guest guides. About 30 members participated and this provided an excellent opportunity for our members to know more about the habitat and species in this Wetland of International Importance under the Ramsar Convention. We all enjoyed the trip and have developed various interests in this field.

To provide information and advice for ELSS members on their future careers, we organized a Career Workshop on 24 March 2006. Three ENS graduates: Dr. Alan Leung (Senior Conservation Officer, WWF Hong Kong), Dr. Ng Sai Chit (Senior Conservation Officer, KFBG) and Mr. Terence Fong (Senior Consultant, Environmental Resources Management Ltd) kindly came to the workshop as our guest speakers to

Fig. 1. ELSS trip to Mai Po.

share their working experiences and possible challenges in finding a career. Furthermore, under the friendly atmosphere, there were many interactions throughout the workshop. All the participants now know much more about career prospects in the field of Environmental Life Sciences.

We have also produced an Electronic Magazine – "Leaf with U" which includes a variety of interesting topics. Please visit this link to get the Magazine and know more about our society: http://web.hku.hk/~elsshku

Finally, we would like to take this opportunity to express our gratitude to all Departmental staff, graduates, postgraduates and members who have given us so much support and advice over the past six months. Although we did not accomplish all our goals, we will continue to do our best for the interests of our members, and serve as a bridge between the Department and our members.

Fig. 2. Bird watching at Mai Po.

Will Luk Keng become another Sham Chung?

by Fion Cheung

Luk Keng is the largest (32 ha) freshwater marsh in Hong Kong (Dudgeon & Chan, 1996). It was designated as a Conservation Area (CA) by the Town Planning Board in 1994 and ranked 4th out of 12 priority conservation sites identified in the New Nature Conservation Policy of Hong Kong (AFCD, 2004) [see the front page article]. With this designation and also the high ranking in the new policy that the government has attributed Luk Keng, the site appears to be well protected. However, no "real" protection or management has ever been implemented. On the contrary, since 1999 disturbing activities, including flying model aeroplanes and helicopters in the freshwater marsh, have been reported to affect water birds which roost and feed there (Wong, 2000 & 2002), especially on Sundays and public holidays. This situation is worrying because, in the monthly bird survey conducted in February 2005, a juvenile Black-faced Spoonbill (*Platalea minor*), a globally threatened species listed as endangered and with an estimated world population of less than 700 (Viney *et al.*, 2005), was found using Luk Keng as a feeding site (Fig. 1). Three more roosting juveniles were recorded in April 2006 (Fig. 2).

Fig. 1. A juvenile Black-faced Spoonbill recorded at Luk Keng in December 2005 (Photo: Fion Cheung).

Besides birds, Luk Keng is also an important site for invertebrates. It has the highest species richness of aquatic macroinvertebrates when compared with other freshwater wetlands in the territory (Dudgeon & Chan, 1996). In a biweekly adult dragonfly survey started in February 2005, more than one third of the total Odonate species in Hong Kong were recorded, including the globally-endangered Four-spot Midget (*Mortonagrion hirosei*, Figure 3), and six locally-uncommon species (Wilson, 2004): Dusky Lilysquatter (*Cercion calamorum*), Eastern Lilysquatter (*C. melanotum*), Blue Sprite (*Pseudagrion microcephalum*), Chinese Tiger (*Gomphidia kelloggi*), Coastal Glider (*Macrodiplax cora*) and Emerald Dwarf (*Nannophyopsis clara*). Horseshoe crabs (*Tachypleus tridentatus*) were also found breeding in the mangrove area of Luk Keng.

Fig. 2. Three juvenile Blacked-faced Spoonbills recorded in April 2006 (Photo: Fion Cheung).

Fig. 3. A mating pair of *M. hirosei* (Photo: Allen To).

All these data highlight the ecological importance of Luk Keng, just as the wildlife recorded at Sham Chung in the past showed its biological importance. Despite the occurrence of rare species, e.g. Black Paradise Fish *Macropodus concolor* and Brown Fish Owl *Ketupa* zeylonensis, the 7 ha Sham Chung freshwater marsh has already been destroyed under the guise of farming…turf grass (Fig. 4). Now, though it is unofficial, Sham Chung has become a golf course (Fig. 5). Although Luk Keng is a CA, "agricultural use" is also permitted. It is of utmost importance that we keep a close watch on Luk Keng and stop any unfavourable activities or development .

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See also *Porcupine!* 16, 19 and 21 and the update on Sham Chung in this issue.

Fig. 4. Will this heavy machine arrive at Luk Keng one day? (Photo: Allen To).

Fig. 5. Nothing is impossible! Building a golf course by filling in an ecologically important freshwater marsh in Hong Kong (Photo: Allen To).

A fruitful visit to fish larval laboratory in Taiwan

by Anna Situ

While working on the taxonomic composition of fish larvae in Cape d'Aguilar Marine Reserve, I found that there are scarce records, studies and literature on the diversity and abundance of fish larvae in Hong Kong, and no local fish larvae experts. In September 2005, I visited Professor Chiu Tai-Sheng's laboratory at National Taiwan University in Taipei to get training on fish larvae identification under his supervision.

Professor Chiu (Fig. 1) is in charge of the Economic Fish Laboratory in the Institute of Zoology under College of Life Science in National Taiwan University (http://zoology.lifescience.ntu.edu.tw/english/index.htm). His research focuses on the ecology of larval fishes and fisheries genetics. Being the first one to examine species composition and distribution of fish larvae in Taiwan, Professor Chiu has made extensive contributions to larval biology and ecology since the 1980s, including the establishment of a systematic collection of over 50,000 specimens, a database of the geographical distribution of all species around Taiwan, and publication on fish larvae of Taiwan (Chiu, 1999). Currently, his research team (1 post-doctoral fellow, 4 postgraduate students and 2 technicians) concentrates their work on using molecular techniques to investigate the population structure of mackerel, anchovy, ribbonfish and squids.

Fig.1. With Professor Chiu and all lab mates

During my two-week visit, I was trained with techniques in larval identification and learned about the morphological features of different families and procedures of larval staining and illustration (Figs. 2 & 3). Larval staining clears the body tissues of fish and stains the vertebrae and fin rays with a series of chemicals; counts of the numbers of the two structures are often essential characters for identification to genus and species level. I learnt a lot from the rich experience of Professor Chiu's laboratory and got good background knowledge for my project. After verification of my previous identification, I found over 40 families (out of about 100 families recorded in Hong Kong), and at least 84 species of fish larvae recorded in my eight-month samples from Cape d'Aguilar.

From the visit, I was impressed that the Taiwanese government has put much effort into marine resources research. At the National Taiwan University, I found many on-going projects on marine resources around Taiwan. There are three departments, namely: Institute of Zoology; Institute of Fishery Biology; and Institute of Oceanography that conduct research on a wide variety of habitats and taxa. They also offer a wide range of courses to undergraduate and

postgraduate students such as Ecology of Early Life Fish, Fish Diseases, and Ecology of Plankton. I believe that investment in such research and training are also needed in Hong Kong if the government intends to set up a long-term management plan for the sustainable use of local fisheries and other marine resources.

Besides a good experience in laboratory, I also had a great tour around Taipei's night markets! I would like to thank Dr. Sadovy for the funding, and Professor Chiu and all lab mates in his lab for their generosity in hosting my visit.

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Fig.2. The lab in National Taiwan University I worked in.

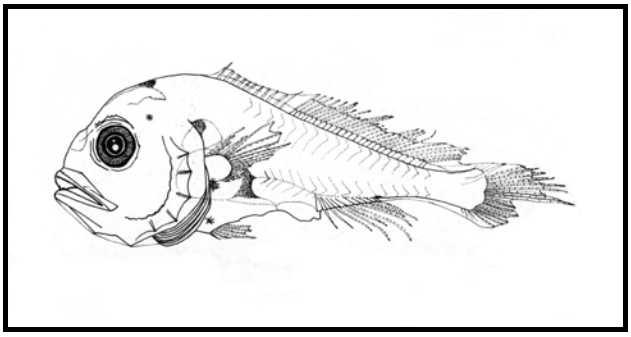

Fig. 3. A croaker (Sciaenidae) larva drawn by Anna Situ and Vivian Fu.

Birdbrains in Big Bird Race 2006

by Tony Hung (ENS 2)

The Big Bird Race 2006 was held from 5 pm on Friday 3 March 2006 to 5 pm the following day. This year, our team - the Swire Birdbrains (Fig.1) was led by Dr. Billy Hau and our team members included Yu Yat Tung (ENS graduate), Tony Hung, Cindy Yuen, Vivian Fu, Vivian Lam, Hey Sung, Philip Yip and Gracie Liu (all ENS Year 2 students). The weather was perfect for birding - a cool, yet sunny, day.

Fig. 1.Swire Birdbrains finishing the Race at Mai Po.

We started at Tsim Bei Tsui, since Mai Po was closed this year due to the avian flu. We arrived at Tsim Bei Tsui earlier, at 3.30 pm, to check out the birds first. We started the race at 5 pm sharp and recorded a Grey Bushchat, which is new to all members except Tung and Billy. We were thrilled to have recorded 71 species in Tsim Bei Tsui and then continued with our "night journey", searching for nocturnal birds such as owls and nightjars. We stayed up until 11 pm without wanting to go back, as the feeling was one-of-a-kind - everything was pitch black and silent until we saw two big "light bulbs" flashing at us, which turned out to be birds! It was definitely worth it despite our weariness. We saw the species, a Savannah Nightjar and a Barred Owlet, several times, raising our count to 73 species on the first day. Although we failed to hear the calls of a Collared Scops Owl we saw it on the morning of the second day. We stayed over at Dr. Hau's place at Morrison Hall and got up at 5 am in the morning. We are immensely grateful to Dr. Hau, he got up earlier than the rest of us to prepare a scrumptious breakfast! The first stop was at the Peak at 6 am to listen for bird calls and then we went back to HKU where we saw our first bird of the day – the Brown Headed Thrush which we had seen every day for two weeks before the race. Then, we went to Tai Po Kau to look for forest birds. Birding at Tai Po Kau is always unpredictable and we were not so lucky this time - recording only 9 species in 2 hours! Undaunted by this setback, we then moved into full throttle at Lam Tsuen, Shek Kong, Long Valley, Nam Sang Wai, Kam Tin and Tam Kong Chau.

We ended up with 138 species which ranked us 6th amongst the 11 competing teams. We were also lucky to have recorded some unique species that other teams did not record in the race like Brown Headed Thrush, Mew Gull, Eyebrow Thrush, Hainan Blue Flycatcher and Hume's Leaf Warbler. Although Mai Po was closed this year, the winner had a total of 158 species which was more than last year's number when Mai Po was one of the observation areas! We raised more than HK$22,000 this year and had tremendous support from 133 sponsors (second highest number of sponsors). A big thank you to all the sponsors and to Professor Dudgeon for sending pledge forms out to staff in HKU. We had lots of ups and

downs during the bird race and enjoyed every single minute of it. As a bonus, each of us got "ticks" for spotting new bird species.

We would like to take this opportunity to show our greatest gratitude to Billy and Tung; Billy for giving us the opportunity to participate in this race and driving us, although he didn't have enough sleep before the race, and Tung for helping us to find so many birds through his amazing bird watching and listening skills! We all can't wait for the next BBR in 2007!

Kadoorie Farm & Botanic Garden - wildlife updates & sightings

by Gary Ades, Roger Kendrick, Amanda Haig, Tan Kit Sun, Peter Paul van Dijk & Captain Wong

General wildlife sightings were posted on the KFBG Wildlife Sightings Board on a fortnightly basis up to mid-April 2006, with records provided by staff and visitors. Many records were generated by the Security team on night shifts. From the middle of April, a new board was introduced at the New Reception, which is updated more frequently with regularly seen wildlife; more unusual sightings are now posted on the KFBG website (www.kfbg.org).

(1) The following sighting records from Kwun Yum Shan (KYS) and elsewhere in KFBG (see map in *Porcupine!* 33 for locations) were posted between October 2005 and May 2006:

October 05

- 2 October, an adult wild boar with 3 piglets behind the Conservation Building.
- 8 October, an adult masked palm civet with 5 young civets at the Apiary.
- 16 October, a Chinese cobra eating a frog below Kwun Yum Shan summit.
- 26 October, three Malayan porcupine at the Upper Canteen.

November 05

- 2 November, three young masked palm civets near the Heli-pad.
- 4 November, a wild boar with 5 piglets at the Parrot Sanctuary.
- 6 November, two masked palm civet at Magnolia Falls.
- 10 November, two wild boar at the Golden Pavilion.
- 15 November, a coral snake at the Apiary.
- 18 November, a masked palm civet near Orchid Haven.
- 25 November, three Malayan porcupine near the Upper Canteen.

December 05

- 2 December, two small wild boar at the heli-pad.
- 9 December, three wild boar at the Parrot Sanctuary.
- 13 December, two barking deer near the Post Office Pillars.
- 17 December, a mother wild boar & 5 piglets near Raptor Sanctuary; one masked palm civet in tree near road junction above Signpost Corner; one Malayan porcupine on the road halfway between Post Office Pillars and the Butterfly Garden; a small Indian (seven banded) civet near the Kadoorie Brothers Memorial Pavilion.
- 20 December, a mother wildboar with 5 piglets at parrot sanctuary at 00.30.

January 06

- 2 January, a masked palm civet at the T.S.Woo Pavilion.
- 10 January, three Malayan porcupine at the Apiary.
- 17 January, a leopard cat at Cock's Summer Camp.
- 22 January, a masked palm civet at the Heli-pad.
- 24 January, flowering trees near T.S.Woo Memorial Pavilion attracted an orange-bellied leafbird, a verditer flycatcher and a forktailed sunbird to feed (Fig. 1).

Fig. 1. Orange-bellied Leaf bird, Fortailed Sunbird and Verditer Flycatcher, at KFBG, 24 January, 2006.

- 26 January, a verditer flycatcher at the Old Deer Haven and Constructed Wetland
- 27 January, a wild boar with 5 piglets at Great Falls arch.

February 06

- 3 February, a mother wild boar with four piglets at the Administration Office.
- 8 February, a masked palm civet at Magnolia Falls.
- 13 February, three Malayan porcupine at Upper Canteen.
- 25 February, two Indian moon moths (*Actias selene*), one at Misha's Bungalow and one at the Butterfly Garden
- 26 February, a baby Mountain racer snake (Fig. 2) at the Chicken Houses; a juvenile red mountain racer was photographed in the early afternoon near the Norman Wright Chicken House.
- 27 February, a barking deer at Signpost Corner.
- 28 February, a mother wildboar with three piglets above the Raptor Sanctuary.

Fig. 2. A juvenile Red Mountain Racer (Photo: KFBG)

April 06

- 1 April, a Japanese pipistrelle bat; Butterfly Garden - visual and on call with detector; a Himalayan leaf nosed bat; west ridge close to post office pillars - visual and on call with detector; one adult wild boar crossing east ridge road near mandarin orchards; one Malayan porcupine entering rock caves on Western ridge (marked by tracking powder); several collared scops owls calling throughout the Farm; lesser spiny frog; calling in upper stream near Magnolia Reservoir; a Chinese water snake in the Lotus Pond; several Hong Kong newts in the Lotus Pond and lower stream and one masked palm civet on the Eastern ridge road between Orchid Haven and Signpost Corner.
- 3 April, a yellow-bellied weasel in the lower stream area was photographed by a KFBG visitor Mahler Ka – this is the first confirmed record of this mammal at KFBG and one of only a handful of sightings in Hong Kong (Fig. 3).

Fig. 3. A yellow-bellied Weasel (Photo: Mahler Ka)

- 14 April, an atlas Moth at the Lam Kam Road car park pick up / set down area wall.
- 23 April, a mountain stream snake in the lower stream near the Streamlife Display and an Anderson's stream snake in the Lotus Pond; several birdwing butterflies (*Troides helena*) were seen flying in the lower farm area.

May 06

- 7 May, a Chinese cobra near the Butterfly Garden.
- 10 May, a young Malayan porcupine was photographed at Orchid Haven.

In addition to the general sightings, Peter Paul van Dijk, Director of the Conservation International CABS Tortoise and Freshwater Turtle Conservation Program, visited KFBG in early March and made a couple of forays onto the hillside, noting the following:

4 March, 21.00-01.00

- Hong Kong Newt – at least four individuals seen in pool by Native Mammal Display. One modest-sized adult (male?) animal seen bending its tail forward and fanning towards another, larger animal.

- *Leptolalax* cf. *pelodytoides* – several calling animals heard in upper stream area. Group of three seen besides rock on sand right at water's edge; photographed. Another calling animal traced to a mud & tree root clump on top of large boulder in streambed (also photographed).

- Hong Kong Cascade Frog – well over a dozen animals seen on various cascade/waterslide sections in the upper stream, some photographed.

- *Paa paraspinosa / exilispinosa* – almost a dozen animals seen in the upper section of the stream. Magnificent eye shine, very wary, none could be easily approached to within photographing distance.

- Guenther's Frog – one small adult seen in stream by Native Mammal Display.

- *Polypedates* cf. *megacephalum* – Several distinctive tadpoles (olive, heavy-bodied, white nose spot) seen in a water lily bowl at the entrance to the Kadoorie Brothers Memorial Pavilion (600 m a.s.l.).

- Big-headed Turtle – three individuals seen in the upper Farm area.

- Small mammal, probably civet (based on eye shine, modest size, no hoof sounds but noisy scrambling up steep slope), as well as heard a larger mammal (barking deer? pig?) run off on a slope, and heard a barking deer run off in the orchards, barking several times when it was at a safe distance.

5 March, 20.00-21.00h.

- Hong Kong Newt – One seen at 14.45 walking on concrete walkway besides Streamlife Display, with a dozen ants crawling over it. Thin animal with regenerated toes on one foot. Removed ants, placed at streamside for photographs, it then walked & swam away into the pool. At night, one large animal seen in koi pond, missing left front foot. Photographed. A few more animals seen in same stream pool as 4 March 2006.

- Asiatic Common Toad – lots everywhere along the roads, drains, streamside, apparently mostly on the move towards breeding pools. A few calls heard at lower farm area.

- Hong Kong Cascade Frog – one large animal seen at upper part of stream section visited, on steep waterslide.

- Guenther's Frog - Several small individuals at Wildlife Pond, giving 'kwek' calls – very small animals for mature calling males – social calls?

(2) Fauna Conservation Department Project News:

The monthly moth survey [Roger Kendrick]

Light trap recording has taken place on seven evenings or nights between late October 2005 and mid May 2006. At least 440 species were recorded, not including data for the last two sessions awaiting analysis At least one macro moth species was recorded in Hong Kong for the first time: *Thinopteryx crocoptera* [Geometridae], in the Butterfly Garden on 26 November 2005. In addition, several older records have been verified, resulting in two new species to Hong Kong – *Scopula pulchellata* [Geometridae] from the Butterfly Garden on 24 April 2003 and *Marapana pulverata* [Noctuidae] also from the Butterfly Garden on 12 May 2001.

Wild Animal Rescue Centre (WARC) [Amanda Haig, Tan Kit Sun]

The number of birds admitted to the centre over the winter period was less than 1/3 of the usual intake. It is suspected that this may be due to the current Avian Influenza situation where birds are being routed directly to HK Govt animal holding facilities.

The construction of a long-awaited flight (Fig. 4) test cage was completed in late March. Its design, uniquely conceived by Fauna Conservation staff, comprises four recycled China Light Power wooden telephone poles, a cable-suspended soft netting structure and sand covered floor. The design prevents occupants from damaging themselves during flight-testing and can easily be taken down during times of inclement weather to prevent damage.

Fig. 4. New flight test enclosure and releasd Crested Serpent Eagle (Photo: KFBG)

As reported in the last edition of *Porcupine!,* the Crested Serpent Eagle *Spilornis cheela* that had suffered a hip fracture having been struck by a truck at Man Kam To made a full recovery and was released in late November 2005.

Animal rehoming to range country organisations involved in captive breeding & conservation projects for those species included:

34 critically endangered Vietnamese pond turtles (Fig. 5), *Mauremys annamensis*, which included two adults rescued from Hong Kong markets and 32 offspring born in captivity, were returned by Kadoorie Farm and Botanic Garden to Vietnam on 10 May. The returnees and their offspring were transferred to the Turtle Conservation Center (TCC) at Cuc Phuong National Park where the government runs a conservation program for critically endangered species, including the Vietnamese pond turtle. "Eventually, the turtles may be released in central Vietnam where they originated", says Bui Dang Phong, manager of the TCC for Cuc Phuong National Park. Mr. Phong says he is elated to see the turtles finally make it back to Vietnam. See the website link for further information.
http://www.asianturtlenetwork.org/library/ATCN_news/2006_articles/Press_release_Endemic_Vietnamese_Pond_turtles_come_home_05_06.html

One Large Malaysian Giant Turtle (Fig. 5) (*Orlitia borneensis*) to Taiping Zoo, Malaysia, where it joins other *Orlitia* in a large lake.

Fig. 5. Rehomed turtles: Malaysian Giant Turtle (left) and Vietnames Leaf Turtle (right).

Below is a list of some of the animals received by the WARC that have been successfully rehabilitated and subsequently released since mid-October 2005.

SPECIES	LOCATION FOUND	RELEASE DATE	RELEASE LOCATION
RAPTORS			
Crested Serpent Eagle *Spilornis cheela*	Man Kam To	25.11.05	KFBG
Crested Serpent Eagle *Spilornis cheela*	Sai Kung	29.11.05	KFBG
Crested Goshawk *Accipiter trivirgatus*	Deep Water Bay	29.12.05	KFBG
Common Buzzard *Buteo buteo*	Tsing Yi	29.12.05	Fanling
Asian Barred Owlet *Galucidium cuculoides*	Lam Tsuen	01.01.06	Lam Tsuen
Oriental Hawk	Kowloon Tong	03.01.06	KFBG

SPECIES	LOCATION FOUND	RELEASE DATE	RELEASE LOCATION
Owl *Ninox scutulata*			
Crested Goshawk *Accipiter trivirgatus*	Sai Wan Ho	18.01.06	Fanling
Common Buzzard *Buteo buteo*	KFBG	25.01.06	KFBG
Asian Barred Owlet *Galucidium cuculoides*	Yuen Long	07.02.06	Yuen Long
OTHER BIRDS			
Chinese Pond Heron *Ardeola bacchus*	Tsim Sha Tsui	21.10.05	Kam Tin
Chinese Pond Heron *Ardeola bacchus*	Wan Chai	21.10.05	Kam Tin
White-rumped Munia *Lonchura striata*	Ocean Park	02.11.05	Tai Po Kau
Chestnut Bittern *Ixobrychus cinnamomeu*	Causeway Bay	04.11.05	Kam Tin
Eurasian Woodcock *Scolopax rusticola*	Sau Ying Pun	11.11.05	Tai Po Kau
Spotted Dove *Streptopelia chinensis*	Ocean Park	11.04.06	KFBG
Cattle Egret Ardeola ibis	Sai Kung	11.05.06	Kam Tin
Red-whiskered Bulbul *Pycnonotus jocosus*	KFBG	18.05.06	KFBG
MAMMALS			
Asiatic Lesser Yellow House Bat *Scotophilus kuhlii*	Launtau	26.01.06	KFBG

(3) Other News

Lepidoptera Conservation Symposium (Roger Kendrick)

As reported in *Porcupine!* 33, KFBG will host the first South East Asian Lepidoptera Conservation Symposium between the 4 and 8 September 2006.

Key speakers include leaders in their field at the regional and global level. They include:

- Prof. Roger Kitching (Griffith University, Australia, a renowned invertebrate conservationist and tropic forest ecologist who has visited DEB in the past);
- Dr. J. Holloway (author of Moths of Borneo – the most complete documentation of moths in Asia and a proponent of using moths as biological indicators);
- Dr Li Hou Hun (author of Gelechiidae of China);
- Dr. Yen Shen-horn, National Sun Yat Sen University, Taiwan, a specialist in the moth families Crambidae and Zygaenidae, as well as supervising many projects of Lepidoptera taxonomy and conservation;
- Dr. Wang Min, South China Agricultural University, Guangzhou, China; Lycaenid expert and supervising students studying a range of lepidopterous conservation and taxonomic issues;
- Representatives of Penang Butterfly Farm, the foremost such business in S.E. Asia with a conservation remit.

Anyone interested in participating in the symposium should contact the Fauna Conservation Department at fauna@kfbg.org. Further information on the symposium is available on-line at

http://asia.geocities.com/hkmoths/SEALCS2006/.

Sham Chung –updates (Captain Wong)

The Sham Chung wetland (Fig. 6) was destroyed and converted into a golf-course turf area in 1997 (*Porcupine!* **19**). This wetland was regarded as one of the top five freshwater wetlands in Hong Kong in 1996 and it was identified as one of the 12 ecological hotspots in the New Hong Kong Nature Conservation Policy in 2004 [for related article, see p. 27].

Since its destruction in 1997, the lowland has been further trashed through mangrove cutting, unauthorized river training and further farmland destruction. However, no enforcement action has been undertaken, as most areas are designated private lands and no suspects have been observed during enforcement activities.

On 3 February 2006, a Development Permission Area (DPA) plan was gazetted. This offers statutory authorization for the Planning Department to undertake enforcement and prosecution in regard to unauthorized developments on private lands. The planning intention of Sham Chung, a pocket area surrounded by Sai Kung West Country Park, is to conserve the areas of high significance and rural character, as well as to maintain the unique landscape and cultural heritage of the area. According to this plan, Sham Chung will provide housing for 570 people.

In the DPA plan, Sham Chung is zoned as follows:

- "Conservation Area" (16.09 ha): hillside, a lowland stream in the southwest and farmlands on higher ground,
- "Green Belt" (2.67 ha): Villages at the foot of the hills at the boundary of the Country Park,
- "Agriculture" (8.33 ha): the turf area (previous freshwater wetland) in the south and some lowland streams,

- "Village Type Development" (V-zone, 2.64 ha): villages in the east; coastal wetland; abandoned fields in the north, and part of a lowland stream, and
- "Coastal Protection Area" (2.64 ha): mangrove and coastal wetland

Drawbacks

1. Inappropriate zoning of habitats

According to the findings of a KFBG site visit on 29 March 2006, the coastal wetland is zoned as "V-zone" and "Agriculture", while a lowland stream with mature riparian vegetation also falls within the boundary of "V-zone". Coastal wetland and lowland stream areas are not ideal places to build small houses.

2. The environmental "vandal" benefits

Most of the previous freshwater wetland area is zoned as "Agriculture". If it had not been converted to grow turf in 1997, no one could argue against the wetland being zoned as a "Conservation Area" due to its high ecological value. Areas zoned as "Agriculture" are often considered as 'landbanks' for further development.

3. Sham Chung - a small town?

Like similar planning forecasts in the rural NT, the projection of 570 residents at Sham Chung is unrealistic. No one is likely to build small houses at a place with no access road.
Taking the case of Tai Long Wan as an example, although the Planning Department's population projections dropped from 200 in October 2001 to 117 in 2006, the actual rural population is still less than 10! This indicates that demand for small house development in remote areas with poor access, i.e., no road, is very low, although land has already been reserved for them.

So, why do we need to reserve a large area for a population of 570 residents that does not and is unlikely to ever exist? Also, how many small houses and how much infrastructure should be built for housing this expected population? Is this a good use of taxpayers' money? Could the natural beauty, biological diversity and rural character of Sham Chung still be preserved if there are 570 residents?

4. Stream protection - buffer area

It is good to note that a lowland stream is zoned as a "Conservation Area" due to the presence of rare freshwater wildlife. However, as there is no buffer area to separate the stream from the nearby "Agriculture" area, any inappropriate agricultural activity could cause a direct impact on the aquatic wildlife in the stream.

Another side to the story

While green groups suggest keeping Sham Chung as natural as possible, the SCMP reported on 18 April that there is plan to include a helicopter landing pad (later denied by the planner), a holiday camp, a resort-style hotel, houses, a picnic area, a private club, a Catholic church, a recreation centre and sport centres at Sham Chung. These urbanization developments are claimed to be compatible with the area's rural setting, and amazingly with the recognition of Sham Chung as one of the 12 sites under the New Nature Conservation Policy. This seems completely illogical!

Recommendations

Apart from zoning the lowland habitats as green zones, the "V-zone" boundary could be much reduced as re-development of old houses at the original villages in land zoned proposed as Green Belt may meet the demand, if any. It is also suggested that the Town Planning Board should encourage wetland restoration at the previous freshwater wetland area by giving a 'green' zoning to this disturbed area.

Further Information

An in-depth article on this issue has been published in the April 2006 issue of Green Country (volume 59, pp 2-9).

Fig. 6. Shum Chung today.

WILD CORNER

Any sightings of civets, mongooses, ferret badgers, leopard cats, barking deer, pangolins and porcupines – live or dead – should be reported. Rare birds, reptiles, amphibians and fishes, or unusual behaviour by common species, are also of interest, as are rare or interesting invertebrates and plants. If you think it is interesting, our readers probably will! Please give dates, times and localities as accurately as possible

MAMMALS

Anton Webb reported the sighting of a large **Barking Deer** near his home in Sai Kung. He was driving along Tai Mong Tsai Road at approximately 10.30 pm on 25 May 2006 when he noticed what he initially thought was a large dog standing at the side of the road. He slowed down and as he drew nearer he realized that it was a Barking Deer. The deer remained quite still and he stopped the car 1.7 m from the deer. The deer was approximately 50-60 cm at the shoulder.